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## Construct Validity of Two Measures of Jungian Typology: The Myers-Briggs Type Indicator and the Singer Loomis Inventory of Personality

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CONSTRUCT VALIDITY OF TWO MEASURES OF JUNGIAN TYPOLOGY:  
THE MYERS-BRIGGS TYPE INDICATOR  
AND  
THE SINGER LOOMIS INVENTORY OF PERSONALITY

by

Anne M. Bradley

A Master's Thesis Submitted to the Faculty of the Graduate  
School of Loyola University Chicago in Partial Fulfillment  
of the Requirements for the Degree of

Master of Arts

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1992

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## VITA

The author, Anne M. Bradley, received a Bachelor of Arts degree in psychology from Rockhurst College of Kansas City, Missouri in May, 1987. She graduated magnum cum laude from the Rockhurst Honors Program and was elected as a member of Alpha Sigma Nu, the Jesuit Honors Society.

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## CHAPTER I

### INTRODUCTION

The attempt to find some way to understand human behavior has taken many forms; from folk medicine to astrology and even our relatively modern science of personality psychology. One of the early personality psychology theorists was Carl Jung. Jung (1971) conceptualized the human mind to be made up of discrete, dichotomous, opposing functions and libidinal forces. According to Jung, these functions and libidinal forces combined to influence human behavior. Given this relationship between the internal structure of the mind and human behavior, we are able to examine human behavior and make propositions about the underlying internal structure. But, the difficulty lies in assuring ourselves that we are examining what we think we are. Several measures based upon Jung's personality theory have been widely used. One of the most popular is the Myers Briggs Type Indicator (MBTI) by Katherine Briggs and Isabel Briggs Myers (1962). Recently, however, the MBTI has been challenged as an appropriate measure of Jung's personality theory (Cowan, 1989; Hudson, 1983; Jarrett, 1972; Loomis, 1982; Loomis & Singer, 1980; Marshall, 1968; Metzner, Burney & Mahlberg, 1981; Ramaprasad

& Mitroff, 1984; Rothenberg, 1971). Whether or not the MBTI is an appropriate measure of Jung's personality theory first depends upon what are the basic concepts in Jung's theory.

### Carl Jung's Theory of Personality

Jung (1971) has divided the variation in human behavior into attitudes and functions, based upon preferred direction of mental activity, the manner in which information is received and the use of that information in decision processes. The direction of the preference in these three categories makes up the individual's typology within Jung's personality model.

The first category of variation in human behavior is the direction of mental activity. In Jung's view, psychic energy must flow in a direction, whether in the outward direction towards other people or external objects or in an inward direction towards one's own conscious self. The direction of energy flow determines the individual's attitude, in Jungian terminology. The introverts' attitude is an abstracting one; these types of individuals are always intent on withdrawing libido from the object, as the object had to be prevented from gaining power over them. Extroverts have a different relationship with the external object. Individuals with this attitude will affirm the importance of the object to such an extent that their subjective attitude is constantly related to and oriented by the object (Jung, 1971). In more behavioral terms, extraverted types have a tendency to get caught up with

whatever is happening in the outer world of objects, people and action around them. Introverted types have a more inward orientation and tend to detach themselves from the world.

Besides these two fundamental attitudes, or orientations of psychic energy, Jung divides the variation of behavior into the performance of mental "functions." The functions are divided into two different fundamental types. The first is based upon the reception of information, the function of perceiving. The second is based upon the use of perceptual information in decision processes, a judging, rational function. Like the fundamental attitudes, Jung divides the separate functions into polar opposites. The perceptual function is divided into two preferred methods of gathering information from both the inner and outer worlds, sensation and intuition. In the sensation function, data takes the form of actions or sense impressions. In intuition, one's perceptions are indirect, distorted by the unconscious, and the source of information is not always clear. Sensate types rely upon information available to their senses, the objective empirical world, whereas intuitive types like to deal with abstractions, hunches and inferred meanings.

The perceptive functions are described by Jung (1971) as being irrational insofar as they are beyond reason. Impulses from the sense organs are irrational, not subject to reason within the perceptual function. Beyond this stage enters the judging function in the application of reason to the contents

of the perceptual process. The judging function processes the information received, irrespective of its source. Unlike the perceptual function, the judging function is subject to reason. It is a rational function in that reason forms the thoughts, feelings, actions and objective values flowing from the judging functions. The laws of reason, according to Jung are the laws that designate and govern the average, "correct," adapted attitude (Jung, 1971). Jung divides the rational function into thinking and feeling. Thinking is the psychological function which, following its own laws, brings the contents of ideation into conceptual connection with one another. It can be active, an act of will, a voluntary act of judgment, or conceptual connections establishing themselves of their own accord, in fantasy (Jung, 1971). Feeling is also a rational function, a process of judging information. Unlike thinking, feeling is an entirely subjective process taking place between the ego and a given content. This process gives to the content a definite value in the sense of acceptance or rejection of the whole conscious situation at the moment (Jung, 1971). In more behavioral terms, thinking types rely on logical structures to put a clarifying order onto a particular situation, they prefer to analyze, synthesize and determine the truth or falseness of information in an impersonal manner. Feeling types evaluate incoming data in terms of their goodness or badness, and are skilled at

understanding other people's feelings and analyzing subjective impressions.

The direction of the functions is determined by the individual's attitude. The conscious attitude taken determines the selection of relevant and the exclusion of irrelevant material. The functions are therefore defined through extraversion or introversion. For example, extraverted thinking is determined predominantly by objective data transmitted by sense perception where introverted thinking is oriented at decisive points by subjective data. Extraverted thinkers elevate objective reality, or an objectively oriented intellectual formula into the ruling principle for themselves and their whole environment. Introverted thinkers follow their ideas inward. The aim is the synthesis and analysis of ideas without relating them to the objective realm of facts (Jung, 1971).

Jung also described the structural properties of the functions and attitudes. The elements of his typology are dichotomous and exclusive and interact to give rise to surface traits (Jung, 1971). According to Jung (1971), the modes of experience within and between functions cannot be used simultaneously. They are dichotomous and exclusive. For example, one cannot think and feel at the same time. Through innate predisposition and/or environmental opportunity/pressures, one of each pair of attitudes, rational and irrational functions is the more developed in conscious

functioning and tends to remain in that relative position. Whichever of the pair is persistently excluded from conscious training and adaptation necessarily remains in an untrained, undeveloped, infantile or archaic condition (Marshall, 1968). The less developed function remains relatively undifferentiated and unintegrated into the ego. Jung defined the undifferentiated function as being fused with one or more other functions, so that it is unable to operate on its own, or its component parts, for example, undifferentiated feelings result in confounding love and hate. Those functions which are undeveloped tend also to be unintegrated into the ego. They are not as available to the conscious control of the person. Because of their ineffectiveness, the use of undifferentiated functions tends to be inhibited, which in turn curtail their opportunities to develop.

Through this process, one function arises as a dominant function; one which is most frequently used and therefore the most differentiated among the functions. However, every individual is capable of opposite modes of experience. What defines the expression of the functions is the relative differentiation of each function, the key word being relative. Individuals predominantly use their dominant function, but not always. According to Jung, the rational and irrational functions can be used simultaneously in the processing of information, from perception to judgment, and therefore allows for the relative differentiation of another function.



Therefore, the dominant function is supported by the "auxiliary" function from the other pair of functions, ie: extraverted thinking supported by sensation or introverted intuition supported by feeling. The auxiliary is the next most differentiated and integrated function.

The auxiliary function is secondary to the dominant function. It provides a balance to the personality. In example, an auxiliary provides the balance of a judging function for a sensing dominant personality. It completes the process of gathering and processing information. Jung clearly states that the auxiliary function is secondary to the dominant function and is necessarily one of the functions opposing the dominant function.

But since it is a vital condition for the conscious process of adaptation always to have clear and unambiguous aims, the presence of a second function, therefore, can have only a secondary importance, as has been found to be the case in practice....Naturally only those functions can appear as auxiliary whose nature is not opposed to the dominant function. For instance, feeling can never act as the second function alongside thinking, because it is by its very nature too strongly opposed to thinking. Thinking, if it is to be real thinking and true to its own principle, must rigorously exclude feeling. (1971, p.405)

The favoring and identification with the most differentiated function, the support of an opposing auxiliary function, and the libidinal orientation of these functions give rise to the various psychological types. The combination of dominant, auxiliary and attitudes give rise to behaviors. For example, those who favor the extraverted thinking function

over all others will exhibit behaviors in common and exclusive to their classification as extraverted thinkers.

### The Myers-Briggs Type Indicator

The appropriateness of the MBTI as a measure of Jungian personality theory has been challenged on multiple grounds. One such challenge has come from Loomis and Singer (1980). Singer and Loomis criticized the MBTI on the basis that the structure of the measure assumes that the functions are exclusive in nature and forces the data to reflect that assumption without regard to its accuracy. In the construction of the MBTI, Myers and Briggs (1980b) assumed that no one could transcend the exclusivity inherent in the development of the dominant and auxiliary, and in the development of the more dominant rational and irrational functions. Loomis and Singer (1980; Singer and Loomis, 1984), as well as other theorists, disagree with this assumption (Cowan, 1989; Hudson, 1983; Jarrett, 1972; Marshall, 1968; Metzner, Burney & Mahlberg, 1981; Ramaprasad & Mitroff, 1984; Rothenberg, 1971). Despite his strongly worded declarations about the exclusive nature of the development of functions, Jung also admitted that two opposite functions may be equally developed. Jung (1971) affirms that in this situation the two functions can only be equal because of their undifferentiated nature.

This, of course, does not do away with the fact that there are individuals whose thinking and feeling are on the same level, both being of equal

motive power for consciousness. But in these cases there is also no question of differentiated type, but merely of relatively undeveloped thinking and feeling. The uniformly conscious or uniformly unconscious state of the functions is, therefore, the mark of a primitive mentality. (p.405)

If the structure of the MBTI does indeed inappropriately force an exclusivity of function on the data, then its validity as a measure of Jungian personality theory is compromised.

## CHAPTER II

### REVIEW OF THE RELATED LITERATURE

#### Bipolarity and Measures of Jungian Typology

It seems that Briggs and Myers (1962) constructed the MBTI on the basis that the presence of a function necessarily excludes the presence of its opposite. Most items on the MBTI contain a choice between a thinking versus feeling, sensation versus intuition, extraversion versus introversion, and judgment versus perception. This type of format implies that a person is either one or another of the pair. In forcing the subject to choose between two functions, the MBTI loses information about that person's relative differentiation of the four functions. Once a subject chooses one function, any information about its opposite is lost. However, if the assumption of exclusivity of the functions is true, the loss of information does not effect the measurement of the relative differentiation of the functions.

Theorists and researchers such as Marshall (1968), Jarret (1972), Loomis and Singer (1980; Singer & Loomis, 1984) Metzner, Burney and Mahlber (1981), Ramaprasad and Mitroff (1984) and Cowan (1989) have expressed discomfort in accepting the exclusivity of the functions. Most of these theorists

have difficulty accepting the assumption that the use of one function inhibits the use of its opposite. Jung (1971) uses the example that one cannot think and feel at the same time. However, it seems that this assumption has not been put to a direct test. Indeed, other theorists assert that one cannot handle a situation effectively without both thinking and feeling (Jarrett, 1972; Marshall, 1968). Rothenberg (1971) proposes the existence of Janusian thinking. This thought process applies specifically to the act of creation and involves the simultaneity of opposition. It is the capacity to conceive and utilize two or more opposite or contradictory ideas, concepts or images simultaneously (Rothenberg, 1971). It is through the tension of the opposites that the creative act takes place. Even if it were not possible to use the functions simultaneously, this assumption would not necessarily negate the possibility of equally developed functions (Metzner et al., 1981). Different situations may necessitate the use of different functions so that individuals may develop their functions within different types of situations. It is conceivable that a person may be in different types of situations of which half demand the use of one function, and half demand the use of another. This would allow for equal opportunities for the functions to develop, resulting in equally developed functions.

Although Jung strongly argues for the exclusivity of the dominant function, he did admit that there are special cases

in which bipolar opposites may be equally well developed. Although Loomis and Singer (1980) argue that this situation may arise from well differentiated personalities, Jung (1971) strongly states that this situation can only exist with relatively undifferentiated types.

This, of course, does not do away with the fact that there are individuals whose thinking and feeling are on the same level, both being of equal motive power for consciousness. But in these cases there is also no question of differentiated type, but merely of relatively undeveloped thinking and feeling. The uniformly conscious or uniformly unconscious state of the functions is, therefore, the mark of a primitive mentality (p. 450).

If Jung did not propose an absolute exclusivity of the dominant function, then it would be expected that a certain percent of a sample would not show bipolarity between the dominant and alternate. This would also make the structure of the MBTI inappropriate as a measure of Jung's typologies. Because of its format, the MBTI can never reflect equally developed functions. Loomis and Singer (1980) reasoned that the forced-choice format of the MBTI unnecessarily affected the determination of a person's dominant function. To test this, they modified the format of the MBTI items to a Likert-scale format. They then compared subjects' dominant functions from the MBTI with their dominants from the revised version of the MBTI. Almost half of the subjects, 46%, exhibited a change in their dominant function from the MBTI to the revised version. Loomis and Singer concluded that the forced-choice MBTI was capable of masking a person's true dominant function.

Their reasoning was that it is possible if subjects were equally well developed within one type of function. For example, if both their T and F functions were highly developed, both would receive only half of the total scores possible because the subjects must choose between one or the other. In addition, if the subjects' S and N functions are poorly developed, but the N function is more developed than the S, the N function would receive a higher percentage of its possible scores; probably higher than only half. If the highly developed T and F functions only receive 50% of their possible scores, and the N more than half, the N would be chosen by the MBTI as the dominant function.

However, there is a flaw in Loomis and Singer's reasoning. The MBTI does not measure the dominant based upon comparing all the functions' scores to one another and selecting the function with the highest score. The dominant is determined by the JP scale in conjunction with the EI scale. A high score of a J indicates that the subject uses the most developed judging/rational function when dealing with the outside world. A higher score of a P indicates that the person uses the most developed perceptual/irrational function when dealing with the outside world. Extroverts use their most well developed function when dealing with the outside world. Introverts use their most well developed function when dealing with the inside world. That is the nature of being an extravert or an introvert. Therefore, extroverts use their

dominant function to deal with the outside world, and introverts use their auxiliary function to deal with the outside world because their dominant is being used in their internal world. So, if individuals are typed as an E and a J, the J indicates that their judging function is dominant and their perceptive function is its auxiliary. However, if individuals are typed as an I and a J, the J indicates that their perceptive function is dominant and their judgment function is its auxiliary.

Even though Loomis and Singer' reasoning may have been based upon a faulty premise, there may be grounds to predict that the forced choice format effects the measurement of the dominant function. Tzeng (1983) examined the nature of forced choice formats. He compared dichotomous forced choice formats with "true/neutral/false," Likert scale without neutral, and Likert scale with neutral formats. Tzeng created four versions of one measure by changing the items to match the four different formats. When comparing the dichotomous format with the Likert with neutral format, 9% of the items were rated as neutral on the Likert scale but were chosen as true or false on the dichotomous format. Tzeng concluded that dichotomous formats unnecessarily introduce error variance into the measurement of a construct. From his analyses, Tzeng further concluded that, because of the reduction of data, dichotomous formats lose information about the relevance of the items to the subject, cannot detect relative differences



between two subjects on the same personality characteristic or relative saturation of two characteristics for one subject, and tend to overemphasize minimally relevant characteristics, and de-emphasize the maximum dominant characteristic for each subject. In general, Tzeng (1983) concluded that dichotomous measures do not act well as direct measures of relative saturations on underlying trait continua, given that they do not reflect the characteristics of the trait's continuity.

If Tzeng's conclusions are accurate, then the forced-choice format may indeed spuriously influence the measurement of the dominant function on the MBTI. The EI and JP scales attempt to measure the relative saturation of traits. For example, the JP scale attempts to measure the relative level of differentiation of the functions within an individual. If the forced-choice format tends to overemphasize minimally relevant, de-emphasize maximum dominant characteristics and introduce error variance into the measure, the JP scale may not be a very valid method of determining the dominant function. However, if the method of comparing all the function's scores for the highest score is used, then the forced choice format would confound the measurement through the paradox proposed by Loomis and Singer.

Singer and Loomis (1984) also reported other results which were to support the inaccuracy of the assumption of exclusivity and bipolar opposition of functions. Out of a sample of artists and psychotherapists, 20% artists and 27%

psychotherapists "did not have as their least-developed cognitive mode a function that was the bipolar opposite of their most highly developed cognitive mode." In a separate study, Loomis and Singer (1980) rewrote the MBTI, changing the format from forced-choice to rating the items on a scale from 1 to 7. They found that 29 out of 79 people sampled (36%) did not exhibit "the superior-inferior opposition in their profiles (Loomis & Singer, 1980, p. 354)." Loomis and Singer concluded that these results were in contradiction to Jung's assumption of bipolar opposition which results from the exclusive nature of the dominant function's development. However, Jung does not argue that the dominant and inferior functions are necessarily bipolar opposites.

In his discussion of inferior functions and the development of the dominant type, Jung (1971) stated that "As a consequence of this one-sided development, one or more functions are necessarily retarded." According to this statement, multiple non-dominant functions can be inferior functions, not necessarily only the bipolar opposite of the dominant function. In his description of individual types, Jung (1971) stated that the extraverted-feeling woman represses thought most of all and the introverted-intuitive man represses sensation most of all. However, he also describes extraverted irrational types as basing themselves exclusively on experience, so exclusively that their judgment cannot keep pace with their experience. From his description

of personality types and his assumptions about their structure, Jung leaves the identity of the least developed type undefined. Bipolar opposition applies to the dominant and auxiliary functions and to the relative differentiation of the functions within perception or judgment, not to the dominant versus least differentiated function.

Given that Jung's assumption that the use of functions is mutually exclusive is of questionable accuracy, and that Jung, himself, proposed an exception to the effects of mutual exclusivity, the possibility that functions may be equally developed, a more effective measure of Jungian personality typologies may be obtained when the functions are assessed independently. Unfortunately, Loomis and Singer' results evaluating this issue are inconclusive because of the inaccuracy of some of their own assumptions.

#### Occupational Choice and Jungian Typology

If a measure which assesses the functions independently is a more effective measure of Jungian typology, one would expect that it would measure predicted relationships with other variables more effectively. One such relationship is that between Jungian typology and the field of study chosen by college students (Carland & Carland, 1987; Goldschmid, 1967; Jung, 1971; Miller, 1988; Myers & Myers, 1980). Certain jobs or fields of study are hypothesized to demand proficiency with certain functions. For example, if a field of study demands exact attention to innumerable details, people with a highly

developed sensing function will perform well (Miller, 1988). If they perform well in this area, then they are more likely to select this area as a field of study, and more likely to survive its tests.

In Carlyn's (1977) review of the MBTI, she came to the conclusion that it has moderate predictive validity in the area of choice of major. For example, she cited a study by Goldschmid in which the MBTI was found to have moderate predictive validity in the derivation of regression equations forecasting college major (cited in Carlyn, 1977). For males, a science major was predicted by a negative relationship with extraversion, and the humanities by a positive relationship with intuition and perception (cited in Carlyn, 1977). For females, humanities major was predicted by a negative relationship with sensation and thinking functions.

Myers also cited a study by MacKinnon and Laney in which they found patterns between the dominant/auxiliary pair and fields of college study (cited in Myers, 1980). Of those with a finance or commerce major 51% were ST's. Of those majoring in nursing, 44% were SF's. Of those majoring in counseling, 76% were NF's. Of those majoring in science, 57% were NT's. Of those majoring in health-related professions, 44% were NF's. Of those majoring in education, 42% were SF's. Of those majoring in journalism, 42% were NF's. Two thirds of those majoring in PE and health were equally split between ST's and SF's.

The relationships between the MBTI and the Strong Vocational Interest Blank (SVIB) and the Strong-Campbell Interest Inventory (SCII) have also been frequently explored. One such study comparing the MBTI with the SVIB, that by Stricker & Ross (1964), found that the EI scale was correlated with the professional, technical-scientific and negatively correlated with social service and business contact scales on the SCII. The SN scale was correlated with the professional, technical-scientific, social service and verbal scales, and negatively correlated with business detail and business contact scales. The TF scale was correlated with the social service scale. The JP scale was correlated with the verbal scale, and negatively correlated with business details scale.

Dillon and Weissman (1987) also evaluated the relationship between the MBTI and the Strong-Campbell Interest Inventory. For males, the SCII realistic category contained mostly ST's, the artistic category contained NFP's, the social category contained mostly EF's, the enterprising category contained mostly E's, and the conventional category contained mostly ESJ's. For females, the investigative category contained most NT's, the artistic category contained mostly NP's, the social category contained mostly ENP's, the enterprising category contained mostly ET's and the conventional category contained mostly SJ's.

One issue in the measurement of occupational or field of study choice is that of the differences in typology according

to gender. Myers (1980) has noted that females taking the MBTI generally show a greater preference for the use of the Feeling function in comparison to the Thinking function. This difference in typology seems to generalize to comparing typologies within and between college majors. For example, Carland and Carland (1987) found a significant difference in the Feeling/Thinking function, as measured by the MBTI, between males and females in business and nonbusiness majors. Males preferred the use of the Thinking function, and females preferred the use of the Feeling function. However, in a study by Hoy and Boulton (1983) it was found that female students preferred the Thinking function. This situation becomes a concern when looking at averaged profiles across a major.

#### Scope of the Current Study

The purpose of the current study is to examine the construct validity of the MBTI and the SLIP, specifically in the areas of the effect of the format on the assumption of mutually exclusive functions and the bipolar opposition of dominant/auxiliary pairs. The questions to be addressed are if the criticisms of the MBTI's forced-choice format are supported, and how does the change in format affect the construct validity of the measure.

#### Hypotheses

1. The forced-choice format of the MBTI is hypothesized to restrict the choice of dominant/auxiliary pairs to those that

are bipolar opposites. It is expected that a revised MBTI, with a scaled format, and the SLIP would show more dominant/auxiliary pairs which are not bipolar opposites than the original version of the MBTI.

2. If the forced-choice format erroneously influences the construct validity of the MBTI, it would be expected that

a. The correlations between opposing attitudes and functions would be lower within a scale formatted measure of Jungian typology than a measure with a forced-choice format.

b. The scales of a scaled format MBTI would correlate only moderately with the scales of the original MBTI.

c. A factor analysis of the scaled format of the MBTI would result in factors reflecting the structural characteristics of personality typology proposed by Jung. Further, this factor structure would be similar but not identical to that found on the original MBTI and the SLIP.

3. If the lack of a forced-choice format produces a more effective measure of Jungian personality typology, it would be expected that the revised version of the MBTI would be more effective at predicting college majors than the original version of the MBTI.

## CHAPTER III

### METHOD

#### Subjects

The subjects were 89 students drawn from a pool of undergraduate introductory psychology classes in a Chicago Jesuit university. Students in introductory psychology classes were required to participate in psychology experiments and were given class credit for doing so. Students selected experiments from folders which contained the date, time, number of credits possible, and location of the experiment. The subjects of this study ranged from 17 to 38 years in age, and were primarily in their freshman year (see Table 1). Of the 84, 37 were males, 47 were females. The university primarily draws from Chicago and its suburbs in the makeup of its student body.

#### **Instruments**

##### Singer Loomis Inventory of Personality

The SLIP is a paper and pencil, self-report personality inventory. It is composed of fifteen situations. Within each situation is a series of eight "I" statements describing behaviors in response to the situation. The individual rates



Table 1

Descriptive Statistics on Age and Year of Study

---

Variable	Mean	S.D.	Median	Mode
Age	19.35	2.31	18.77	19
Year	1.45	.78	1.22	1

---

each "I" statement on a scale of one to five on how often they behave in this manner, one being never, five, always. The following is an example of one of the situations used in the SLIP:

I have a free day coming up this week and will be able to do whatever I want. I would:

1. Imagine what is possible, then wait to see what the day brings before I decide.
2. Participate in some sport with other people.
3. Spend part of the day working in a group doing something of importance.
4. Try something new with a few friends.
5. Anticipate going with my group to a benefit for a worthwhile charity.
6. Do some of the planning and organizing that I have been putting off.
7. Call up the theatre and reserve a ticket for a show I've been wanting to see.
8. Stay home alone and get into one of my hobbies like gardening, painting, woodworking, music, or yoga.

(Singer & Loomis, 1984)

Each of the "I" statements reflects a different cognitive mode. A cognitive mode, according to Loomis and Singer, is a pairing of an attitude with a function, for example: IF or EF, IS or ES. Singer and Loomis (1984) refer to Jung's conceptualization of the relationship between the attitudes and functions. According to Jung (1971), the function does not exist separate from the attitude, the orientation of energy, but is conceptualized in combination with the attitude as a cognitive mode.

Gorlow, Simonson and Kraus (1966) reported a study which

seems to support the assumption that the functions and attitudes coexist. They performed a Q-sort on 100 propositions selected from Psychological Types by Jung. Subjects sorted the propositions into 11 piles along the dimension of "least like myself" to "most like myself." Gorlow et al. performed a principle components factor analysis on the results. The factor analysis resulted in eight factors which accounted for 46.03% of the variance. From an item analysis, Gorlow et al. labeled the first six factors EF, IT, ET, IT-B, ES EN. According to Gorlow et al. the remaining two factors were not readily interpretable. Notably, each of the first six factors retained the structure of a function paired with an attitude.

The sum of the weight assigned to the situation responses results in a score for each of the eight cognitive modes (ES, IS, EN, IN, EF, IF, ET, IT). The preference for the judging or perceiving function is calculated by combining the scores of the judging and perceiving cognitive modes separately. Thus, the SLIP produces 16 scales based upon the combination of the eight cognitive modes and the preference for judging or perceiving.

The current SLIP, and that used in this study, is the third version of this instrument and is still in its experimental edition. Most of the published work on the SLIP's reliability and validity is from research done on the earlier versions. According to Singer and Loomis (1984), the

third version was published to accommodate the information from statistical analyses of the previous two versions.

The sample on which Singer and Loomis performed construct validity and reliability analyses were primarily white, over half had graduate training, 40% were male and 60% were female. Singer and Loomis (1984) also reported that they deleted all subjects under the age of 20 years of age from the sample when performing the reliability analyses, reasoning that the SLIP had been designed for an adult population. However, these same subjects were included in the construct validity analyses. In the manual for the third version of the SLIP, Singer and Loomis (1984) also state that the SLIP, in its present version, is designed to be used with high school and college students and adults. The appropriate age group for use of the SLIP remains ambiguous.

Reliability. In the manual for the current edition of the SLIP, Singer and Loomis (1984) reported coefficient alpha reliabilities for the eight cognitive modes ranging from .56 for extroverted feeling to .71 for extroverted sensation. The reliability coefficients for the four functions were: sensation=.80, intuition=.76, thinking=.80, and feeling=.73. Reliability coefficients for the orientations were: extraversion=.88 and introversion=. 5. Reliability coefficients for the dominant functions were: judging=.86 and perception=.85.

Construct Validity. Singer and Loomis (1984) also

reported factor analyses which indirectly support the construct validity of their measure. In the current SLIP manual, Singer and Loomis (1984) reported the results of two factor analyses performed on the second version of the SLIP with one sample of 1233 subjects. The first analysis utilized the Alberta General Factor Analysis Program, which analyzes a sample in total and split halves for principal components. This analysis was performed on the first 1188 subjects. After an additional 45 subjects completed the SLIP, Singer and Loomis performed a principle components factor analysis on the sample, now totaling 1233 subjects.

The results of these analyses were very similar. In both analyses, four factors were found. All four factors consisted of roughly equal numbers of introversion and extraversion oriented items. Loomis and Singer labelled the factors Perceptual, Perceptual-Affective, Judging-Reflective and Judging-Active. Altogether, the four factors account for 26.73 percent of the variance in the principal components analysis from the 1233 subject sample. In the principal components analysis resulting from the Alberta General Factor Analysis Program, the SLIP accounted for 25.74 percent of the total variance, when utilizing the measure as a whole. Singer and Loomis (1984) concluded that the factor analyses provided indirect support for the construct validity of the four functions.

However, it is notable that the factors obtained from

the analyses do not support pairing the functions with an attitude. In the construction of the SLIP, Singer and Loomis assume that each function can only exist when paired with an attitude. But, the results of the factor analyses show a relatively equal number of extraverted and introverted items per factor.

Criterion Validity. Singer and Loomis (1984) also reported the results of Loomis' doctoral dissertation in which she compared SLIP profiles for a sample of artists and psychotherapists using the first version of the SLIP. Loomis found that psychotherapists had significantly higher scores than artists for extraverted thinking, introverted intuition and extraverted intuition. According to Singer and Loomis (1984), these results correspond with their prediction that psychotherapists would need to have higher intuitive skills. Although they did not predict that psychotherapists would show higher thinking skills, Singer and Loomis allowed that this result could logically be understood under Jung's theory of personality development.

Loomis and Saltz (1984) reported a different study in which they used the original version of the SLIP to predict artistic styles in 45 professional artists. The artists supplied self-descriptions of their art. Loomis and Saltz used the self-descriptions to categorize the artistic style of the artist using style categories developed through a cluster analysis of the descriptions of eight twentieth century

artists. Loomis and Saltz found that artists with different personality types reported different artistic styles, and vice versa. Loomis and Saltz (1984) concluded that the results supported the SLIP's measurement of extraversion, introversion, judgmental and perceptive functions.

Content Validity. Singer and Loomis (1984) reported that each item of the SLIP was evaluated in the construction of the third version. Each item was evaluated in terms of its correlation with orientation, function and cognitive mode (a function combined with its libidinal direction). Each item was also evaluated in terms of its factor loading in the principal components analysis, and a Procrustes factor analysis. Items were relabeled, removed or rewritten if so judged to be appropriate under these criteria.

#### Myers-Briggs Type Indicator

The MBTI is also a paper and pencil, self-report personality inventory. The form used in this study, form F, contains 166 forced-choice items (Myers, 1976). Each item is designed to reflect a choice between opposites. The directions state to choose one of the two endings to sentences which comes closest to telling how the subject usually feels or acts, or to choose one of two words based upon how much it appeals to the subject. An example of an item is as follows:

1. Does following a schedule  
    (A) appeal to you, or  
    (B) cramp you?  
    (Myers, 1976)

The theory on which the MBTI is based closely parallels Jung's personality theory. The MBTI contains extraversion vs. introversion (E-I), sensation vs. intuition (S-N) and thinking vs. feeling (T-F) scales. However, it also contains a judging vs. perception scale. While this scale is not taken directly from Jung's theory it does attempt to indicate which function is dominant and which is its auxiliary function. The judging vs. perception (J-P) scale indicates which type of function, judging or perceptual, individuals favors when dealing with the world on which they prefer to focus. The dominant process is that function with which the person deals with the external environment, and the auxiliary process is the function with which the person deals with the internal world. Therefore, the J-P preference works differently with extroverts and introverts. Extroverts prefer to focus on the outer world. Therefore their favorite process is the one they tend to most use in the outer world. Introverts prefer to focus on their inner world. Therefore, their favorite process is the one they tend to most use in their inner world. Introverts relate to the outside world with their auxiliary function (Myers, 1980). The J-P scale works in combination with the E-I scale to determine the dominant and auxiliary functions. For example, if individuals are typed as an E and a J, the J indicates that their judging function is dominant and their perceptive function is its auxiliary. However, if individuals are typed as an I and a J, the J indicates that their



perceptive function is dominant and their judgment function is its auxiliary.

Ninety-five of the items apply towards the scales. Of those items scored, most contain answers which correspond to the opposite poles within orientations (E-I), types of functions (S-N and T-F), or direction of dominant function (J-P). Some contain answers of which only one is scored. Answers are weighted as worth either one or two points. According to Myers (1980), the weights are assigned to counteract social desirability. The weights of endorsed answers are summed. Preference scores are computed by subtracting the totals for opposites functions. For example, the preference score for the E-I scale is computed by subtracting the total of the E items and the total of the I items. The greater total indicates the direction of the preference. The difference score is then applied to a table in which the difference scores correspond to a preference score. The preference score indicates the reported strength of the preference. Continuous scores can also be obtained by using the difference score and adding a constant to avoid negative values.

Reliability. Internal consistency reliabilities for the individuals scales generally range from .59-.81 (EI), .66-.85 (SN), .63-.78 (TF for males), .63-.69 (TF for females) and .53-.82 (JP) based upon continuous scores (Carlson, 1985; Carlyn, 1977; Mendelsohn, 1965; Sipps, Alexander & Friedt,

1985; Sundberg, 1965; Webb, 1964;). When using dichotomous scores the reliabilities consistently tend to be .10 points lower than those found for the continuous data (Carlyn, 1977). The TF scale consistently tends to have lower internal consistency reliability coefficients (Carlson, 1985; Carlyn, 1977; Mendelsohn, 1965; Sipps, Alexander & Friedt, 1985; Sundberg, 1965; Webb, 1964;).

Information on the stability of the scales is less available. In one study over a 14 month period the test-retest reliabilities for EI, SN and JP were .70 and .48 for TF (Mendelsohn, 1965) Sundberg (1965), reported test-retest coefficients of .73 (EI), .69 (SN and JP) and .48 (TF). Carlson (1985), reported that test-retest EI, TF and SN coefficients ranged from .56 to .89. The lower coefficients were consistently from the TF scale. Computations based upon continuous scores tended to score higher reliability coefficients (Carlson, 1985). Younger and less capable groups tended to obtain somewhat lower reliabilities, especially on the TF scale (Carlyn, 1977; Sundberg, 1965).

Construct Validity. Studies in which factor analyses are performed on the MBTI seem to support its construct validity (Sipps & Alexander, 1987). Comrey (1983) factor analyzed the MBTI using a minimum residual method. He found five major factors. He labeled them IE, NS, TF, FT and PJ. In the EI factor, 15 out of 22 items were from the MBTI-EI scale. In the NS factor, 21 out of 26 items were from the

MBTI-SN scale. In the TF factor 8 out of 23 items were from the MBTI-TF scale. The same is true of the FT scale. In the TF scale, all the b responses added to individuals' T scores. In the FT scale, all the b responses added to the individuals' F scores. In the PJ factor, all of the 24 items were from the MBTI-JP scale.

Sipps, Alexander & Friedt (1985) used a principle components analysis and found 6 major factors which explained 27.4% of the variance. They did not label the first and sixth factors. The remaining factors were labeled JP, TF, EI and SN. In the JP factor, all of the 17 items were from the MBTI-JP scale. In the TF factor, 10 of the 13 items were from the MBTI-TF scale. In the EI factor, all of the 16 items were from the MBTI-TF scale. In the SN factor, all of the 11 items were from the MBTI-SN scale.

Tzeng, Outcalt, Boyer, Ware & Landis (1984) reported that a factor analysis yielded facts which matched almost perfectly with the theoretical scales of the MBTI. However, they do not elaborate on the nature of the factors or the amount of variance account for by the factors.

Thompson and Borrello (1986a) used a principle components analysis which yielded four major factors. They labeled the factors JP, EI, SN and TF. In the JP factor, 22 of the 24 items were from the MBTI-JP scale. In the EI factor, 20 of the 22 items were from the MBTI-EI scale. In the SN factor, 22 of the 26 items were from the MBTI-SN scale.

In the TF factor, 16 of the 23 items were from the MBTI-TF scale. All the factors were very highly correlated with the corresponding MBTI scale continuous scores (.92 to .96 and -.84 to -.94), with the exception of the EI factor and the I scale, which was -.06. Thompson and Borrello (1986b) also performed a second-order factor analysis on the same data. They used 32 factors from the preceding analysis which had eigenvalues greater than 1 as input for the second-order factor analysis. The analysis resulted in four major factors which were almost identical to the first-order factor. They also found support for the differential weighting of items. According to their results, items which were weighted as 2 tended to have larger factor pattern coefficients than items weighted as 1.

Criterion Validity. A substantial body of empirical data has developed on the MBTI in which it has been related to creativity, academic achievement, vocational preferences, aesthetic preferences, values, needs, aptitudes, turnover in positions, differences between natural groups and behavior ratings. Multiple reviewers of the MBTI have concluded that it has been related meaningfully to a wide range of variables in terms of personality, ability, interest, value, aptitude and performance measures, and that the results tend to broadly support the hypotheses generated by Jungian personality theory (Carlyn, 1972; Carlson, 1985; Coan, 1972; Mendelsohn, 1965; Sundberg, 1965).

Coan (1972) and Mendelsohn (1965) summarized much of the

criterion related validity studies performed on the MBTI. Their conclusions were that the EI scale seems to measure extraversion and introversion in more of the popular sense of sociability than in the Jungian sense. The SN scale seems to refer to a practical, conventional, realistic attitude in contrast to one more idea and theory oriented. The TF scale seems to reflect a legalistic, rationalistic, versus humanistic, sympathetic approach. The JP scale seemed to refer to a preference for order and planning as opposed to spontaneity and novelty. It seems that the MBTI scales reflect particular behavior domains which overlap somewhat with Jungian personality typology. The MBTI seems to sample from more behaviorally oriented domains which can only indicate the state of the internal structures and dynamics as proposed by Jung. However, Myers (1980) acknowledges that this is just the case when she states

Since the more superficial aspects of type are often the easiest to report, many trivial reactions are useful for identification, but these are merely straws to show which way the wind blows. They are not the wind. (p.24).

Most of the studies mentioned above analyze the MBTI in terms of its individual scales. Mendelsohn (1965) pointed out that Jung's personality theory proposes that an individual's different types interact in a complex manner which is exhibited in the individual's behavior. According to Mendelsohn (1965), the little data which directly evaluate this hypothesis are inconclusive.

Content Validity. Not all scales of the MBTI are independent of one another, contrary to what would be predicted from Jung's personality theory. The SN and JP scales of the MBTI are consistently correlated with one another (Carlyn, 1977; Bruhn, Bunce & Greaser, 1978; Mendelsohn, 1965; Sundberg, 1965; Thomas, 1984; Webb, 1964;). The correlations between these two scales range from .26 to .47 (Carlyn, 1977, Thomas, 1984). The TF and JP scales tend to also be related, but not as strongly or consistently (Bruhn, et. al., 1978; Mendelsohn, 1965; Thomas, 1984).

Strong negative relationships exist between the opposite poles of the scales. Tzeng et al. (1984) report an average coefficient of  $-.84$ .

In Coan's review of the MBTI (1972), he analyzed the item content of the scales. His conclusions were that the EI scales emphasizes expressiveness and sociability as opposed to reserve, suggesting the social dimension of the EI scale; the T scale tended to emphasize logic and impersonal justice, but not as much the truth-orientation central to the Jungian concept of the thinking function; the F scale emphasizes warmth and compassion, which is more appropriate to the EF function; and the SN scale presented a contrast between imagination and practical-mindedness and a contrast between theory and abstraction and facts that would be more appropriate to the EI attitudes.

Criticisms of the MBTI. Sundberg (1965) criticized the

forced-choice format of the items based upon the reactions of subjects completing the measures. He found that over half of the subjects reported feeling less motivated to be careful because of the unrealistic choices they were asked to make.

Sipps, Alexander and Friedt (1985) found that the factors correlated only weakly with their corresponding MBTI scales when they performed a principle components factor analysis on the MBTI. They also found no difference within the factor structure to account for the difference in male and female TF scale scoring or the difference in weights between items. They also pointed out that 71 of the items of the MBTI are not scored and the reason for their inclusion ambiguous, making the measure unnecessarily bulky and time consuming.

#### Revised Myers-Briggs Type Indicator.

The MBTI was revised in order to evaluate the effect of a dichotomous item format on the bipolarity of the dominant and auxiliary pairs and the construct validity of the measure. The format of each item was changed to a 5 point Likert scale. Subjects were instructed to rate each response to the stem sentence on how much they felt the item applied to how they feel or act. For example, the MBTI item

1. Does following a schedule
  - (a) appeal to you, or
  - (b) cramp you?

was replaced by two items:

- A1. Following a schedule....
  1. cramps me.
  2. appeals to me.

each of which the subjects would rate on a scale of 1 to 5.

Two rules of thumb were also applied in the conversion of MBTI items. All qualifiers or words implying relative frequencies were removed from the responses. This was done so that the responses could have the same baseline of frequency or intensity of the behaviors. Different baselines would likely have affected how the subjects rated the responses. For example, if one response states that the person always does something, and the second response states that the person sometime does something else, the higher frequency response may more likely be rated lower than the low frequency response because of the wording. The second rule of thumb was the removal of all words which compared one response to another which were only appropriate to a dichotomous assumption. For example, most items contained an implicit comparison between responses by using an "or" between the responses.

Response ratings were totaled and then averaged for each scale, E, I, S, N, T, F, J and P. Individuals were also "typed" according to which of the function pairs had a higher average. For example, the E and I scale were compared and one type chosen as the more dominant attitude for that individual. The averages were used because of the difference in number of items per scale. If the scales were not expressed with the same base, the difference in number of items per scale could have biased the "typing" of the individuals. For example, there are more items in the S scale than the N scale. If the



raw totals of these scales are used to decide which is the more dominant function, the probability that the S will be chosen is inflated simply because there were relatively more items on this scale than on the N scale. However, if the averages are used, the difference in number of items should not effect the probability of which function is chosen as the more dominant.

### Procedure

At the beginning of the experimental sessions, the subjects were introduced to a form which described the procedures followed to ensure the confidentiality and anonymity of their data. The subjects were then introduced to the nature of the experiment. The measures were described as personality surveys with no right or wrong answers. Subjects were then administered the three measures, the SLIP, MBTI and the revised version of the MBTI described above. The measures were administered one at a time to groups of 10-15 subjects. Within administrations, subjects were randomly divided into 6 groups. These groups were based upon all possible orders in which the three measures could be administered. Each group received the measures in a different order, so that the order of completing the measures was balanced across subjects. After completing all the measures, each subject was asked to complete a short questionnaire covering demographic information such as gender, age, year of study in college and major.

Five subjects were dropped from the sample after completing the experiment because of irregular responses to the revised form of the MBTI. Four subjects completed most of one page of this measure with a pattern of numbers: "5 4 3 2 1 2 3 4 5 4 3 2 1," etc.. The fifth subject completed only every other item on the revised form of the MBTI.

## CHAPTER IV

### RESULTS

#### Reliability of the Measures

Measures of internal consistency (Cronbach's alpha coefficients) were computed for all three measures. In the MBTI, the alpha coefficients range from  $-.31$  to  $.55$  for the individual scales. The coefficient alpha for the test as a whole was  $.54$ . The coefficients found in this study fall in the lower range of those found in previous studies (Carlson, 1985; Carlyn, 1977; Mendelsohn, 1965; Sipps, Alexander & Friedt, 1985; Sundberg, 1965; Webb, 1964). The pattern of the coefficient values across the scales is also consistent with previous studies. For example, the coefficient alpha for the TF scale is the lowest of the four, with the SN scale the next highest value.

The coefficients for the Revised MBTI (R-MBTI) scales exhibited a wider range of values. The coefficients ranged from  $.29$  to  $.78$ . Unlike the MBTI, the SN and TF scales had the highest coefficient alphas (see Table 2). The EI and JP scales have much lower coefficient alphas. The coefficient for the measure as a whole was high,  $.87$ .

Table 2

Alpha Coefficients of the MBTI and Revised-MBTI Scales

---

Scale	MBTI	R-MBTI
Total score	.5416	.8671
EI	.5527	.4226
SN	.3527	.7810
TF	-.3087	.7540
JP	.4398	.2914

---

cognitive mode scales. These range between .55 and .67 (see Table 3). The coefficient alpha for the test as a whole was .90. These results are very consistent with those found by Loomis and Singer (1982) for the current version of the SLIP.

### Test Construction Issues

It is proposed that the forced-choice format of the MBTI restricts the sensitivity of this instrument to non-opposite dominant and auxiliary pairs. In order to assess this hypothesis it is necessary to re-examine the method by which the MBTI determines which functions are dominant and auxiliary. In the MBTI, the dominant is determined by the score on the JP and EI scale. The auxiliary is assumed to be the highest scoring function from the other pair of functions. For example, if the dominant is F, then the auxiliary must be a S or N. This method of determining the dominant/auxiliary pair would mask the existence of any non-opposite pairs even if the items are changed to a scale format. The SLIP uses the method of simply comparing the functions and choosing the two with the first and second highest percentage of scores. This method does not mask the existence of possible non-opposite dominant-auxiliary pairs.

Another issue which arose when the method of scoring the R-MBTI was determined was the number on which to base the scale scores so that they are comparable. As noted previously, the scales contain different number of items. The measurement of the attitudes and functions should reflect the

Table 3

Alpha Coefficients of the SLIP Scales

---

Scale	Alpha Coefficient
Total Score	.9004
ES	.5508
EN	.5527
ET	.6684
EF	.5486
IS	.6047
IN	.6675
IT	.5980
IF	.6772

---

assumption that, if only chance is operating, all the scales should be equal. However, this is not true in the construction of the MBTI. This situation was amplified in the R-MBTI because each item was split into at least two and retained in the measure. To correct for this bias, the scale scores were divided by the number of items in the scale. It was the averages which were compared against each other to determine the dominant and auxiliary pairs for the R-MBTI. However, the SLIP uses a different base for comparing the scales against one another. Singer and Loomis (1982) decided to use the score from the measure as a whole as a base for the individual scales to prevent response biases from effecting the validity of the instrument. The sum of each cognitive mode is divided by the total score. If this method were to be used with the R-MBTI, the comparison of scales against one another would still be biased by the relative difference between number of items per scale.

Therefore, the R-MBTI scale scores were averaged for any analyses. But, the dominant and auxiliary pairs were also calculated using the method from the SLIP, basing the scale scores upon the total instrument score. This was done to provide a comparison approach and will be designated as the Revised-MBTI based upon the Total score (R-MBTI-T). In order to provide further comparisons, all dominant-auxiliary pairs were computed by using both the PJ and EI scale method utilized by the MBTI and the maximum score method used by the

SLIP. These approaches will be designated as the PJ method and the maximum method. Default methods will be used unless otherwise noted for comparison purposes. The default methods for scoring the MBTI are those set down by Myers (1962); the PJ method is used to determine the dominant-auxiliary pairs and the individual scale scores represent the sums of the scale's items. The default methods for scoring the R-MBTI are the use of the maximum score comparison when determining the dominant-auxiliary pair and the scale scores represent averages of the sum of scale items. The default methods for scoring the SLIP are those given by Loomis and Singer (1982). They use the maximum score comparison when determining the dominant-auxiliary pair and the scale scores represent the sum of scale items divided by the total score of the instrument as a whole.

In order to compare the SLIP against the MBTI and R-MBTI more directly, the cognitive modes were collapsed to form E, I, S, N, T, F, J, P scores from ES, EN, EF, ET, IS, IN, IF and IT scores. For example the E scale was constructed by combining all the items from scales with the E attitude, resulting in an E scale. The same procedure was performed on the other attitude and functions. The J and P scales were constructed by combining the judging function scales and the perceptive scales, respectively. Each scale is divided by the total score just as the cognitive modes were. The E, I, J and P scales have 32 items each, because four scales were combined



to make up each one, whereas the S, N, T and F scales have 16 items each, because two scales were combined to make up each one. Unlike on the R-MBTI, this does not become a problem when determining the dominant and auxiliary functions because only functions with the same number of items per scale are compared against each other. This method of reorganizing the scales has also been used by Singer and Loomis (1984).

This organization of the scales will only be used to compare the SLIP with the MBTI and R-MBTI. The decision to reorganize the SLIP was based upon the supposition that the MBTI and the R-MBTI are not amenable to reorganization to fit the eight cognitive modes proposed by Singer and Loomis. The function scale items of the MBTI do not contain any consistent indication of the libidinal direction of the function, making it difficult to construct scales based upon ES, EN, IS, IN etc. functions.

### **Construct Validity**

#### Effect of the Forced-Choice Format Upon Dominant-Auxiliary Pairs

In order to examine the hypothesis that the forced-choice format of the MBTI effected the determination of the dominant-auxiliary pairs, these pairs were calculated with the multiple number of methods described above (see Table 4 and 5).

Even though the PJ method of determining the dominant-auxiliary pair is replaced by a method which would not mask

Table 4

Frequency of Dominant-Alternate Pairs as Determined by the  
PJ Method

Measure	ST/TS	SF/FS	NT/TN	NF/FN	Not Opposite	Equal Scores
MBTI	27	17	16	24	0	0
R-MBTI	12	34	8	30	0	0
R-MBTI-T	11	41	6	25	0	0
SLIP	15	20	23	24	0	0

Table 5

Frequency of Dominant-Alternate Pairs as Determined by the  
Maximum Score Method

Measure	ST/TS	SF/FS	NT/TN	NF/FN	Non-Opposing Pairs		Equal Scores
					SN/NS	FT/TF	
MBTI	27	17	16	23	0	0	1
R-MBTI	11	34	6	25	0	5	3
R-MBTI-T	8	29	5	16	3	20	3
SLIP	11	15	15	11	9	13	8

possible non-opposite pairs, it should be noted that the MBTI does not show any non-opposite pairs. But, the revised version of the MBTI shows five subjects with non-opposing dominant-auxiliary pairs, and three subjects with ties for their highest two scales. That comes to 9% of subjects from the MBTI who no longer met the criteria for bipolar opposite dominant-auxiliary pairs on the revised form of the MBTI. When the pairs from the MBTI are compared with those from the SLIP, 30% of the subjects from the MBTI no longer meet the criteria for bipolar opposite dominant-auxiliary pairs on the SLIP.

#### Correlations of Scales

If by choosing one response over another, subjects are decreasing the opportunities of adding scores to one scale while proportionally adding to another, it would be expected that these two scales would be highly correlated with one another. It would be expected that the MBTI scales will correlate highly within attitudes or functions, and that the R-MBTI and the SLIP will do so only at a lower value. However, this is not the case with the data presented in Table 6. Most of the scales are moderately correlated, with the exception of two scales on the R-MBTI, which are more strongly correlated.

It was also hypothesized that, because the forced-choice format affects the construct validity of the MBTI, changing the forced-choice format will affect the realm of behavior

Table 6

Pearson Correlations Between Opposite Functions

Scale	MBTI	R-MBTI	SLIP
E & I	-.63	-.83	-1.00
S & N	-.56	-.53	- .58
T & F	-.51	-.56	- .55
J & P	-.53	-.72	-1.00

Note. All coefficients are significant at the .001 two-tail probability level.

which the measure assesses. If this is true, then it would be expected that the R-MBTI would not correlated highly with the MBTI, despite the similarity of items between the two measures. This hypothesis seems to be upheld in the data in Table 7. The correlation coefficients of the scales of the MBTI and R-MBTI range between .61 and .75. Also of note are the very low correlation coefficients between the MBTI and the SLIP, as well as the R-MBTI and the SLIP scales.

### Factor Analyses

If the forced-choice versus scaled format has an effect upon the construct validity of a measure it would be expected that the factor structure resulting from the measure would also be affected. The factor structures of a measure with the forced-choice format and a measure with the scaled format should be similar because, in this case, the measures are based upon the same theory, with very similar items. But they should also be dissimilar because of the effect of the difference in format of the items.

A principal components factor analysis was performed on all three of the measures in this study. Five factors were extracted from each analysis based upon the point at which the eigenvalues for the factors began to level off (see Table 8). These factors were rotated according to varimax criteria.

The content of the factors was examined in terms of how it reflected Jungian personality typology and the composition of the scales from the three measures. Tables showing the

Table 7

Pearson Correlations Between the Same Functions

Scale	MBTI x R-MBTI	MBTI x SLIP	R-MBTI x SLIP
E	.75	.14 (n.s.)	.25
I	.71	.35	.22
S	.61	.25	.18
N	.61	.18	.28
T	.64	.17 (n.s.)	.27
F	.62	.21	.20
J	.66	.08 (n.s.)	-.09 (n.s.)
P	.74	-.10 (n.s.)	-.01 (n.s.)

Note. All correlations are significant at least at the .05 two-tail probability level unless otherwise noted (n.s.).

Table 8

Eigenvalues of Extracted Factors

Factors	Eigenvalues		
	MBTI	R-MBTI	SLIP
1	9.69	15.22	11.39
2	8.06	11.84	6.35
3	6.36	9.05	5.46
4	4.43	7.91	4.98
5	3.13	6.08	4.51
6	2.84	5.52	4.24
7	2.63	4.76	3.56
total above	29	38	34



items composing the factors of each analysis can be found in Appendices C, D, and E. From Table 9 it can be seen that three of the factors mirror the scales of the MBTI. The second factor seems to be identified with the TF scale of the MBTI. The third factor seems to be identified with the EI scale, and the fourth factor with the JP scale. The first and fifth factors contained items from every scale, without a clear pattern identifying them with a specific scale.

The analysis of the R-MBTI revealed a factor structure which looked much different from the structure of the MBTI. The factors seem to reflect the interaction of attitudes and functions (see Table 10). The first factor seems to be identified with an ESTJ typology. The second factor seems to be identified with the ENFP typology, the third with an IF attitude/function pair, the fourth with an S-N combined with the P scale and the fifth with the N scale.

The factor analysis of the SLIP resulted in a factor structure which seemed to reflect two of the SLIP scales (see Table 11). Although factors one, four and five did not contain a clear pattern of items, factors two and three seemed to be identified with the SN and E scale, respectively.

#### Measures of Jungian Typology and College Major

If the change from a forced-choice format to a scaled format results in a more effective measure of Jungian typology, it would be expected that the R-MBTI and SLIP would be able to predict variables related to Jungian typology more

Table 9

Composition of MBTI Factors


---

Factors	Ratio of items with eigenvalues above .35	Scale of Best Fit
1		indeterminant
2	11/19 belong to TF scale	TF
3	10/11 belong to EI scale	EI
4	7/9 belong to JP scale	JP
5		indeterminant

---

Table 10

Composition of Revised-MBTI Factors


---

Factors	No. of Positive Loadings per scale								Scale of Best Fit
	E	I	S	N	T	F	J	P	
1	7	2	9	0	8	3	12	1	ESTJ
2	4	0	0	3	0	5	0	6	ENFP
3	1	12	2	0	1	6	0	2	IF
4	1	0	6	8	2	0	0	8	S/NP
5	0	2	0	6	1	0	1	2	N

---

Table 11

Composition of SLIP Factors

Factors	Ratio of items with eigenvalues above .35	Scale of Best Fit
1		indeterminant
2	10/15 belong to SN scale	SN
3	11/14 belong to E scale	E
4		indeterminant
5		indeterminant

effectively than the MBTI.

The subjects' self-reported majors were collapsed into the categories of "Science," "Business," "Arts," "Political Science/History" and "Other." Science consisted of majors such as the hard sciences, biology, chemistry, physics, other behavioral sciences and nursing. Business consisted of majors such as marketing, finance, economics, accounting and business management. Arts consisted of such majors as fine arts and language arts. Political Science/History consisted of political science, pre-law and history majors. The "Other" categories consisted of majors such as math, philosophy, environmental engineering and education.

Because of the differences between males and females on the MBTI when related to major and occupation (Carland & Carland, 1987; Hoy & Boulton, 1983; Myers, 1980;), they were compared separately with their major. This resulted in tables with a higher percentage of cells with less than 5 as an expected value. Chisquare statistics could not have been validly applied to these data. Because of the small number of subjects per cell, the conclusions of the following comparisons are tentative.

Among the males on the MBTI, a higher percentage of ST/TS's than would be expected had Business or "Other" majors (see Table 12). A higher percentage of NT/TN's were Science majors. A higher percentage of NF/FN's had Arts or Political Science/History majors. Among the females, a higher

Table 12

Males' MBTI Dominant-Alternate Pairs Cross-tabulated with Major

Dominant-Alternate Pair	Science	Business	Arts	Pol/History	Other
ST/TS	5 (33%)	7 (47%)	1 (50%)	0 ( 0%)	2 (13%)
SF/FS	0 ( 0%)	1 (50%)	0 ( 0%)	1 (50%)	0 ( 0%)
NT/TN	4 (50%)	3 (38%)	1 (13%)	0 ( 0%)	0 ( 0%)
NF/FN	4 (36%)	3 (27%)	2 (18%)	1 ( 9%)	1 ( 9%)
All	13 (36%)	14 (39%)	4 (11%)	2 ( 6%)	3 ( 8%)

Note. Percentages within dominant-alternate pairs are ratios of subjects with that personality configuration who have chosen that major. Percentages in the "All" row reflect the ratio of all male subjects with that particular major.

percentage of ST/TS's than would be expected had Business or Political Science/History majors (Table 13). A higher percentage of SF/FS's were Science majors. A higher percentage of NT/TN's were Business and Arts majors. A higher percentage of NF/FN's were Arts and Political Science/History majors.

Among males on the R-MBTI, a higher percentage of ST/TS's than would be expected were Business majors (Table 14). A higher percentage of SF/FS's were Political Science/History majors. A higher percentage of NT/TN's and NF/FN's were Science majors. A higher percentage of TF/FT's were business majors. Among females on the R-MBTI, a higher percentage of SF/FS's than would be expected were Science majors (Table 15). A higher percentage of TF/FT's were Business and Other majors.

Among males on the SLIP, a higher percentage of SN/NS's than would be expected were Science majors (Table 16). A higher percentage of ST/TS's, SF/FS's and NT/TN's were Business majors. A higher percentage of NF/FN's were Arts majors. A higher percentage of TF/FT's were Science and Arts majors. Among females on the SLIP, a higher percentage of SF/FS's and NF/FN's were Arts majors (Table 17). A higher percentage of NT/TN's were Science majors. A higher percentage of TF/FT's were business majors.

Table 13

Females' MBTI Dominant-Alternate Pairs Crosstabulated with Major

Dominant-Alternate Pair	Science	Business	Arts	Pol/History	Other
ST/TS	6 (50%)	3 (25%)	1 ( 8%)	2 (17%)	0 ( 0%)
SF/FS	8 (53%)	3 (20%)	2 (13%)	1 ( 7%)	1 ( 7%)
NT/TN	2 (25%)	2 (25%)	3 (36%)	9 ( 0%)	1 (13%)
NF/FN	4 (31%)	1 ( 8%)	3 (23%)	3 (23%)	2 (15%)
All	20 (42%)	9 (19%)	9 (19%)	6 (13%)	4 ( 8%)

Note. Percentages within dominant-alternate pairs are ratios of subjects with that personality configuration who have chosen that major. Percentages in the "All" row reflect the ratio of all female subjects with that particular major.



Table 14

Males' R-MBTI Dominant-Alternate Pairs Crosstabulated with Major

Dominant-Alternate Pair	Science	Business	Arts	Pol/History	Other
ST/TS	0 ( 0%)	4 (67%)	0 ( 0%)	0 ( 0%)	2 (33%)
SF/FS	3 (30%)	2 (20%)	2 (20%)	2 (20%)	1 (10%)
NT/TN	2 (67%)	0 ( 0%)	1 (33%)	0 ( 0%)	0 ( 0%)
NF/FN	4 (57%)	2 (29%)	1 (14%)	0 ( 0%)	0 ( 0%)
TF/FT	3 (33%)	6 (67%)	0 ( 0%)	0 ( 0%)	0 ( 0%)
All	3 (36%)	14 (39%)	4 (11%)	2 ( 6%)	3 ( 8%)

Note. Percentages within dominant-alternate pairs are ratios of subjects with that personality configuration who have chosen that major. Percentages in the "All" row reflect the ratio of all male subjects with that particular major. One subject did not have a dominant-alternate pair.

Table 15

Females' R-MBTI Dominant-Alternate Pairs Crosstabulated with Major

Dominant-Alternate Pair	Science	Business	Arts	Pol/History	Other
SN/NS	1 (33%)	1 (33%)	1 ( 33%)	0 ( 0%)	0 ( 0%)
ST/TS	1 (50%)	1 (50%)	0 ( 0%)	0 ( 0%)	0 ( 0%)
SF/FS	11 (58%)	2 (11%)	3 ( 16%)	2 (11%)	1 ( 5%)
NT/TN	0 ( 0%)	0 ( 0%)	2 (100%)	0 ( 0%)	0 ( 0%)
NF/FN	4 (44%)	2 (22%)	2 ( 22%)	1 (11%)	0 ( 0%)
TF/FT	3 (27%)	3 (27%)	1 ( 9%)	1 ( 9%)	3 (27%)
All	20 (42%)	9 (19%)	9 ( 19%)	6 (13%)	4 ( 8%)

Note. Percentages within dominant-alternate pairs are ratios of subjects with that personality configuration who have chosen that major. Percentages in the "All" row reflect the ratio of all female subjects with that particular major.

Table 16

Males' SLIP Dominant-Alternate Pairs Crosstabulated with Major

Dominant-Alternate Pair	Science	Business	Arts	Pol/History	Other
SN/NS	4 (57%)	1 (14%)	1 (14%)	0 ( 0%)	1 (14%)
ST/TS	2 (29%)	3 (43%)	0 ( 0%)	1 (14%)	1 (14%)
SF/FS	1 (14%)	3 (43%)	1 (14%)	1 (14%)	1 (14%)
NT/TN	1 (20%)	4 (80%)	0 ( 0%)	0 ( 0%)	0 ( 0%)
NF/FN	1 (33%)	1 (33%)	1 (33%)	0 ( 0%)	0 ( 0%)
TF/FT	2 (50%)	1 (25%)	1 (25%)	0 ( 0%)	0 ( 0%)
All	3 (36%)	14 (39%)	4 (11%)	2 ( 6%)	3 ( 8%)

Note. Percentages within dominant-alternate pairs are ratios of subjects with that personality configuration who have chosen that major. Percentages in the "All" row reflect the ratio of all male subjects with that particular major. Three subjects did not have a dominant-alternate pair.

Table 17

Females' SLIP Dominant-Alternate Pairs Crosstabulated with Major

Dominant-Alternate Pair	Science	Business	Arts	Pol/History	Other
SN/NS	1 (33%)	0 ( 0%)	2 (67%)	0 ( 0%)	0 ( 0%)
ST/TS	1 (25%)	0 ( 0%)	0 ( 0%)	3 (75%)	0 ( 0%)
SF/FS	3 (38%)	1 (13%)	3 (38%)	1 (13%)	0 ( 0%)
NT/TN	7 (70%)	1 (10%)	1 (10%)	0 ( 0%)	1 (10%)
NF/FN	3 (38%)	1 (13%)	2 (25%)	1 (13%)	1 (13%)
TF/FT	3 (33%)	4 (44%)	0 ( 0%)	1 (11%)	1 (11%)
All	20 (42%)	9 (19%)	9 (19%)	6 (13%)	4 ( 8%)

Note. Percentages within dominant-alternate pairs are ratios of subjects with that personality configuration who have chosen that major. Percentages in the "All" row reflect the ratio of all female subjects with that particular major.

## CHAPTER V

### DISCUSSION

It seems that there is tentative support for the hypothesis that the forced-choice format of the MBTI decreases its sensitivity to non-opposing dominant-auxiliary pairs. Although the MBTI did not result in any non-opposing dominant-auxiliary pairs, a revised version which changed the forced-choice format to a scale format did result in eight subjects without opposite pairs. This number, is quite small. However, this result is somewhat strengthened by the results of the SLIP in which 30 subjects did not have bipolar opposite dominant-auxiliary pairs. The R-MBTI retained the order of the items from the original MBTI. This means that items from opposite ends of the polar functions were grouped under one sentence stem. Although the subjects are instructed to rate each item separately, the fact that they are grouped together may imply a comparison, and so the rating of each item may not be independent. In the SLIP, items from all eight of the cognitive modes are grouped under one sentence stem. This structure may also imply some comparison, but not as much as the structure on the R-MBTI. In some respects, the MBTI, R-MBTI and SLIP present a continuum of structures enhancing

independence of item rating, with the MBTI being the least independent and the SLIP being the most independent. The number of non-opposing dominant-auxiliary pairs increases from the MBTI, to the R-MBTI and to the SLIP, thus supporting a hypothesis that the choice between items reduces the sensitivity of the measure to non-opposing pairs. This argument rests upon the assumption that the SLIP is a valid measure of Jungian typology. Although Singer and Loomis (1984) have provided some support of the SLIP's validity, it is still a relatively new instrument. The SLIP needs to have more research performed upon it before any definitive answer to the question of its validity can be given.

The correlations found between opposite ends of the attitude or functions within each measure did not support the hypothesis that the forced-choice format forces a bipolarity upon the data. The correlation coefficients were of only moderate strength for most of the measures, unlike the strong correlations found for the MBTI in previous research (Tzeng, et al., 1984). However, the correlations between measures provided some support for the hypothesis that the format of the items effect the construct validity of the measures. The correlation coefficients for attitude and function scales of the MBTI and R-MBTI were moderate to moderately high in terms of their strength. The correlations were of the strength which suggests that the two measure overlap in terms of the behavior domain which they assess, but do not assess identical

behavior domains. Given that the difference between the MBTI and the R-MBTI is the format of the items, it would seem that the format has an effect upon the construct validity of the measures.

The factor analyses performed on the MBTI, R-MBTI and the SLIP resulted in factor structures which were different from each other. The factor structure resulting from the MBTI seemed to be consistent with factor analyses performed in earlier studies. Most factor analyses on the MBTI resulted in factor structures which reflected the composition of the MBTI scales. Most factors were based upon at least three of the EI, SN, TF and JP scales (Comrey, 1983; Sipps, Alexander & Friedt, 1985; Thompson & Borello, 1986a, Tzeng, et al., 1984). The results of this study are consistent with previous factor analyses in that the current analysis resulted in three factors which reflected the TF, EI and JP scales.

The factor analysis performed on the R-MBTI resulted in a much different factor structure. This factor structure seemed to reflect the interaction between attitudes and functions which make up the personality typology. For example, the first factor seemed to be identified with the ESTJ typology. As Mendelsohn (1965) pointed out, Jung's personality theory proposes that an individual's different types interact in a complex manner. In other words, the pattern of the types influences behavior in a way which cannot be captured if the individual's scales are examined

separately. The results of the factor analysis performed on the R-MBTI are consistent with this hypothesis. The factors coalesced in such a way as to suggest that the interaction of the scales result in personality type which cannot be broken down and still retain its meaning. This result suggests that the forced-choice format of the MBTI may, in fact, be hindering its ability to assess the individual's personality typology with the structural characteristics proposed by Jung.

The results of the factor analysis of the SLIP in the current study were not consistent with those found by Singer and Loomis (1984). Singer and Loomis found a factor structure which reflected the composition of the SLIP more closely than the factor structure found in the current study. The current factor analysis resulted in only two factors which reflected something of the SLIP scales. Again, the SLIP is a relatively new instrument and more research needs to be performed to definitively comment on its construct validity. The difference between Singer and Loomis's study and the present one may be due to constructs in the measure which are not well-defined, or the disparity in the number of subjects between the two factor analyses. Singer and Loomis performed the factor analysis with 1233 subjects while this study contain 84 subjects. Perhaps, if this study had more subjects, the resulting factor structure would be more similar to that found by Singer and Loomis.

The results of the MBTI, R-MBTI and SLIP



crosstabulations with major are contrary to the hypothesis that the force-choice format results in a less effective instrument when predicting college major. Of the three measures, the MBTI seemed to predict the college majors with the highest consistency with the implications from Jung's theory and the results from previous research. previous research and extrapolations from Jung's theory primarily identify the ST scale with business majors such as finance, commerce and marketing; the SF scale with nursing, education and other helping profession-oriented majors, the NT scale with science and law; and the NF scale with counseling, health-related, journalism, humanities and artistic majors (Carland & Carland, 1987; Carlyn, 1977; Goldschmid, 1967; Hoy & Boulton, 1983; Myers, 1980). In the MBTI, subjects with ST/TS, SF/FS and NF/FN dominant-auxiliary pairs tend to have majors which fit those proposed by earlier research and the implications of Jung's theory. Additionally, male subjects with an NT/TN dominant auxiliary pairs tend to choose a science major, as would be predicted from Jung's theory.

The results of the R-MBTI and the SLIP are more mixed. Males on the R-MBTI, tend to have majors which would be predicted for them, with the exception of those with SF/FS dominant-auxiliary pairs. The R-MBTI dominant-auxiliary pairs do not seem to discriminate between majors very well for females. Only those with a SF/FS pair show a clear tendency to choose a particular major. However, it was a major which

was inconsistent with that proposed by previous research and the implications of Jung's theory.

Subjects with NF/FN dominant-auxiliary pairs on the SLIP show a tendency to be art majors. Male ST/TS's tend to be business majors and female NT's tend to be science majors. These results are consistent with previous research and would be predicted from Jung's theory. However, they are only half of the different types of pairs. Subjects with the other four pairs did not show a clear pattern indicated a tendency to have a major consistent with the results from previous studies. Therefore, it seems that the MBTI has been more effective in capturing the relationship between dominant-auxiliary pairs and college major.

Support for the hypothesis that the forced-choice format of the MBTI affects the construct validity of this measure seems to be mixed. There is tentative evidence that the MBTI is not sensitive to non-opposing dominant-auxiliary pairs which exist in the population. The intercorrelations within the measures do not support the hypothesis that the forced-choice format of the MBTI forces a negative correlation between opposing ends within the attitude or function. The pattern of correlations between the measures and the factor analyses provide some support for the hypothesis that the forced-choice format affects the behavior domain assessed by the MBTI. However, this was not supported in the examination of the relationship between the measures and college major.

It seems that there are some indications that the forced-choice format does affect the sensitivity of the MBTI to non-opposing dominant-auxiliary pairs, but how this effects the construct validity of the measure remains to be seen.

It seems that research in the future may profitably focus upon several areas uncovered by this study. One such area is the factor structure of the SLIP. Singer and Loomis (1984) found a factor structure which more closely mirrored Jungian typology. However, this study did not find a clear factor structure mirroring the SLIP scales, although relatively clear factor structures were found for the MBTI and the Revised-MBTI.

Another area for future research could be in the relationship between the MBTI and the SLIP and choice of college major. Unfortunately, this study did not contain enough subjects to examine this issue with any certainty.

Finally, a third area of interest is in the effect of the physical relationship between items. In the MBTI, the items reflecting bipolar opposites are next to each other. In the Revised-MBTI the same items are next to each other, although there are no instructions to compare them against each other. In the SLIP, items reflecting all possible functions are next to each other. Notably, the Revised-MBTI show several non-bipolar-opposite dominant-auxiliary pairs. However, they do not show as many as the SLIP. This may be

due to an implicit pull for comparison between items on the Revised-MBTI because they are placed next to each other.

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## **APPENDIX A**

**PERSONALITY TYPE INDICATOR****DIRECTIONS**

There are no "right" or "wrong" answers to these questions. Your answers will help show how you like to look at things and how you like to go about deciding things. Knowing your own preferences and learning about other people's can help you understand where your special strengths are, what kinds of work you might enjoy and be successful doing, and how people with different preferences can relate to each other and be valuable to society.

Read each question carefully and mark you answer on the separate answer sheet. **Make no marks on the question booklet.** Do not think too long about any question. If you cannot decide on a question, skip it but be careful that the next space you mark on the answer sheet has the same number as the question you are then answering.

Rate each item on a scale of 1 to 5 where:

- 1 is DISAGREE
- 2 is SOMEWHAT DISAGREE
- 3 is NEUTRAL
- 4 is SOMEWHAT AGREE
- 5 is AGREE

as to how much you feel the statement applies to how you feel or act. Fill in the blank with the number that most closely corresponds to you. Fill in an answer for the numbered items.

---

1	2	3	4	5
DISAGREE	SOMEWHAT DISAGREE	NEUTRAL	SOMEWHAT AGREE	AGREE

- A1. Following a schedule...
1. cramps me.
  2. appeals to me.
- B1. I get along with...
3. imaginative people.
  4. realistic people.
- C1. If strangers are staring at me in a crowd, I...
5. become aware of it.
  6. do not notice it.
- D1. I am careful about people's...
7. feelings.
  8. rights.
- E1. I enjoy...
9. deciding things.
  10. letting circumstances decide a matter for me.
- F1. When I am with a group of people, I like to...
11. join in the talk of the group.
  12. talk individually with people I know well.
- G1. When I have more knowledge or skill in something than people around me it is satisfying to...
13. guard my superior knowledge.
  14. share it with those who want to learn.
- H1. When I have done all I can to remedy a troublesome situation I am...
15. able to stop worrying about it.
  16. still haunted by it.
- I1. If I were asked on a Saturday morning what I was going to do that day I would...
17. be able to tell.
  18. list twice too many things.
  19. have to wait and see.
- J1. I think that...
20. children have the best of it.
  21. life is interesting for grown-ups.
- K1. In doing something that many other people do, it appeals to me to...
22. do it in the accepted way.
  23. invent a way of my own.
- L1. When I was small, I felt...
24. sure of my parent's love and devotion to me.
  25. that they admired and approved of some other child more than they did of me.

M1. I...

26. prefer to do things at the last minute.

27. find that doing things at the last minute is hard on the nerves.

N1. If a breakdown or mix-up halted a job on which I and a lot of others were working, my impulse would be to...

28. enjoy the breathing spell.

29. look for some part of the work where I could still make progress.

30. join the "trouble-shooters" who were wrestling with the difficulty.

O1. I...

31. show my feelings freely.

32. keep them to myself.

P1. When I have decided upon a course of action, I...

33. reconsider it if unforeseen disadvantages are pointed out to me.

34. put it through to a finish, however it may inconvenience myself and others.

Q1. In reading for pleasure, I...

35. enjoy odd or original ways of saying things.

36. like writers to say exactly what they mean.

R1. In any of the ordinary emergencies of everyday life, I like to...

37. take orders and be helpful.

38. give orders and be responsible.

S1. At parties, I...

39. get bored.

40. have fun.

T1. It is hard for me to adapt to...

41. routine.

42. constant change.

U1. I am willing to take on a heavy load of extra work for the sake of...

43. extra comforts and luxuries.

44. a chance to achieve something important.

V1. The things I plan or undertake...

45. are things that I can finish.

46. prove too difficult to carry through.

- W1. I am attracted to...  
47. a person with a quick and brilliant mind.  
48. a practical person with a lot of common sense.
- X1. I find people...  
49. slow to appreciate and accept ideas not their own.  
50. open-minded.
- Y1. When I have to meet strangers, I find it...  
51. pleasant, or at least easy.  
52. something that takes a good deal of effort.
- Z1. I...  
53. value sentiment.  
54. value logic.
- A2. I like to...  
55. arrange dates, parties, etc. well in advance.  
56. be free to do whatever looks like fun when the time comes.
- B2. In making plans which concern other people, I like to...  
57. take them into my confidence.  
58. keep them in the dark until the last possible moment.
- C2. It is a compliment to be called...  
59. a person of real feeling.  
60. a consistently reasonable person.
- D2. When I have a decision to make, I...  
61. make it right away.  
62. wait as long as I reasonable can before deciding.
- E2. When I run into an unexpected difficulty in something I am doing, I feel it to be...  
63. a piece of bad luck.  
64. a nuisance.  
65. all in the day's work.
- F2. I ...  
66. enjoy the present moment and make the most of it.  
67. feel that something just ahead is more important.
- G2. I am...  
68. easy to get to know.  
69. hard to get to know.
- H2. With most of the people I know, I...  
70. feel that they mean what they say.  
71. feel I must watch for a hidden meaning.

- I2. When I start a big project that is due in a week, I...
- 72. take time to list the separate things to be done and the order of doing them.
  - 73. plunge in.
- J2. In solving a personal problem, I...
- 74. feel more confident about it if I have asked other people's advice.
  - 75. feel that nobody else is in as good a position to judge as I am.
- K2. I admire the people who are...
- 76. conventional enough never to make themselves conspicuous.
  - 77. too original and individual to care whether they are conspicuous or not.
- L2. It would be natural for me to make the mistake of...
- 78. drifting from one thing to another all my life.
  - 79. staying in a rut that didn't suit me.
- M2. When I run across people who are mistaken in their beliefs, I feel that...
- 80. it is my duty to set them right.
  - 81. it is their privilege to be wrong.
- N2. When an attractive chance for leadership comes to me, I...
- 82. accept it if it is something I can really swing.
  - 83. let it slip because I am too modest about my own abilities.
  - 84. in reality aren't attracted to leadership.
- O2. Among my friends, I am...
- 85. one of the last to hear what is going on.
  - 86. full of news about everybody.
- P2. I am at my best when...
- 87. dealing with the unexpected.
  - 88. following a carefully worked-out plan.
- Q2. The importance of doing well on a test makes it ...
- 89. easy for me to concentrate and do my best.
  - 90. hard for me to concentrate and do myself justice.
- R2. In my free hours, I...
- 91. enjoy stopping somewhere for refreshments.
  - 92. want to use the time and money for something else.

- S2. At the times in my life when things pile up on me the worst, I find that...
- 93. I had gotten into an impossible situation.
  - 94. by doing only the necessary things I could work my way out.
- T2. The people that I know...
- 95. take their fair share of praise and blame.
  - 96. grab all the credit they can but shift any blame on to someone else.
- U2. When I am in an embarrassing spot, I...
- 97. change the subject.
  - 98. turn it into a joke.
  - 99. days later, think of what I should have said.
- V2. Such the emotional "ups and downs" as I may feel are...
- 100. marked.
  - 101. moderate.
- W2. I am...
- 102. a "good mixer."
  - 103. quiet and reserved.
- X2. In my early childhood (at six or eight), I...
- 104. felt my parents were very wise people who should be obeyed.
  - 105. found their authority irksome and escape it when possible.
- Y2. When I have a suggestion that ought to be made at a meeting, I...
- 106. stand up and make it as a matter of course.
  - 107. hesitate to do so.
- Z2. I get annoyed at...
- 108. fancy theories.
  - 109. people who don't like theories.
- A3. When I am helping in a group undertaking, I am struck by...
- 110. the cooperation.
  - 111. the inefficiency.
  - 112. in reality, I don't get involved in group undertakings.
- B3. When I go somewhere for the day, I like to...
- 113. plan what I will do and when.
  - 114. just go.



- C3. The things I worry about are...  
 115. not worth it.  
 116. serious.
- D3. In deciding something is important, I...  
 117. find I can trust my feeling about what is best to do.  
 118. think I should do the logical thing, no matter how I feel about it.
- E3. I have...  
 119. deep friendships with a few people.  
 120. broad friendships with many different people.
- F3. I think my friends...  
 121. feel I am open to suggestions.  
 122. know better than to try to talk me out of anything I've decided to do.
- G3. The idea of making a list of what I should get done over a week-end...  
 123. appeals to me.  
 124. leaves me cold.  
 125. positively depresses me.
- H3. In traveling, I would like to go...  
 126. with a companion who had made the trip before and "knew the ropes."  
 127. alone or with someone greener at it than myself.
- I3. I would like to have...  
 128. an opportunity that may lead to bigger things.  
 129. an experience that I am sure to enjoy.
- J3. Among my personal beliefs are...  
 130. some things that cannot be proved.  
 131. only things that can be proved.
- K3. I like to...  
 132. support the established methods of doing good.  
 133. analyze what is still wrong and attack unsolved problems.
- L3. I has been my experience that I...  
 134. fall in love with a notion or project that turns out to be a disappointment-so that I "go up like a rocket and come down like the stick."  
 135. use enough judgment on my enthusiasms so that they do not let me down.

M3. I think that I get...

136. more enthusiastic about things than the average person.

137. less enthusiastic about things than the average person.

N3. If I divided all the people I know into those I like, those I dislike, and those toward whom I feel indifferent, there would be more of...

138. those I like.

139. those I dislike.

O3. In my daily work, I...

140. enjoy an emergency that makes me work against time.

141. hate to work under pressure.

142. plan my work so I won't need to work under pressure.

P3. I am likely to speak up in...

143. praise.

144. blame.

Q3. It is high praise to say someone has...

145. vision.

146. common sense.

R3. When playing cards, I enjoy...

147. the sociability.

148. the excitement of winning.

149. the problem of getting the most out of each hand.

150. the risk of playing for stakes.

151. in reality, I don't enjoy playing cards.

**DIRECTIONS:** For items 152 through 255 rate each word on a scale of 1 to 5, on the basis of what appeal the word has for you, where:

1 is NOT APPEALING

2 is SOMEWHAT NOT APPEALING

3 is EQUALLY APPEALING AND NOT APPEALING

4 is SOMEWHAT APPEALING

5 is APPEALING

1	2	3	4	5
NOT APPEALING	SOMEWHAT APPEALING	EQUALLY APPEALING & NOT APPEALING	SOMEWHAT APPEALING	APPEALING

- |                   |                     |                 |
|-------------------|---------------------|-----------------|
| 152. firm-minded  | 155. matter-of-fact | 158. congenial  |
| 153. warm-hearted | 156. systematic     | 159. effective  |
| 154. imaginative  | 157. spontaneous    | 160. theory     |
| 161. certainty    | 187. hard           | 213. ideas      |
| 162. party        | 188. production     | 214. compassion |
| 163. theater      | 189. design         | 215. foresight  |
| 164. build        | 190. forgive        | 216. concrete   |
| 165. invent       | 191. tolerate       | 217. abstract   |
| 166. analyze      | 192. hearty         | 218. justice    |
| 167. sympathize   | 193. quiet          | 219. mercy      |
| 168. popular      | 194. who            | 220. calm       |
| 169. intimate     | 195. what           | 221. lively     |
| 170. benefits     | 196. impulse        | 222. make       |
| 171. blessings    | 197. decision       | 223. create     |
| 172. casual       | 198. speak          | 224. wary       |
| 173. correct      | 199. write          | 225. trustful   |
| 174. active       | 200. affection      | 226. orderly    |
| 175. intellectual | 201. tenderness     | 227. easy-going |
| 176. uncritical   | 202. punctual       | 228. approve    |
| 177. critical     | 203. leisurely      | 229. question   |
| 178. scheduled    | 204. sensible       | 230. gentle     |
| 179. unplanned    | 205. fascinating    | 231. firm       |
| 180. convincing   | 206. changing       | 232. foundation |
| 181. touching     | 207. permanent      | 233. spire      |
| 182. reserved     | 208. determined     | 234. quick      |
| 183. talkative    | 209. devoted        | 235. careful    |

184. statement	210. system	236. thinking
185. concept	211. zest	237. feeling
186. soft	212. facts	238. theory
239. experience	244. systematic	250. accept
240. sociable	245. casual	251. change
241. detached	246. literal	252. agree
242. sign	247. figurative	253. discuss
243. symbol	248. peacemaker	254. executive
	249. judge	255. scholar

**DIRECTIONS:** The remaining items follow the original format in response to how much the statement applies to you or your life.

1	2	3	4	5
<b>DISAGREE</b>	<b>SOMEWHAT DISAGREE</b>	<b>NEUTRAL</b>	<b>SOMEWHAT AGREE</b>	<b>AGREE</b>

S3. I find the more routine parts of my day...  
 256. restful.  
 257. boring.

T3. If I think I am not getting a square deal in a club or team to which I belong, I think it is good to...  
 258. shut up and take it.  
 259. use the threat of resigning if necessary to get my rights.

U3. I can...  
 260. talk easily to almost anyone for as long as I have to.  
 261. find a lot to say only to certain people or under certain conditions.

V3. When strangers notice me, it...  
 262. makes me uncomfortable.  
 263. doesn't bother me.

- W3. If I were a teacher, I would like to teach...  
264. fact courses.  
265. courses involving theory.
- X3. When something starts to be the fashion I am...  
266. one of the first to try it.  
267. not much interested.
- Y3. In solving a difficult personal problem, I...  
268. do more worrying than is useful in reaching a decision.  
269. feel no more anxiety than the situation requires.
- Z3. If people seem to slight me, I...  
270. tell myself they didn't mean anything by it.  
271. distrust their good will and stay on guard with them thereafter.
- A4. When I have a special job to do, I like to...  
272. organize it carefully before I start.  
273. find out what is necessary as I go along.
- B4. I feel it is a fault...  
274. to show too much warmth.  
275. not to have warmth enough.
- C4. When I am at a party, I like to...  
276. help get things going.  
277. let the others have fun in their own way.
- D4. When a new opportunity comes up, I...  
278. decide about it quickly.  
279. miss out through taking too long to make up my mind.
- E4. In managing my life, I...  
280. undertake too much and get into a tight spot.  
281. hold myself down to what I can comfortably handle.
- F4. When I find myself definitely in the wrong, I would want to...  
282. admit I was wrong.  
283. not admit it, though everyone knows it.  
284. in reality, don't find myself in the wrong.
- G4. The new people I meet can tell what I am interested in...  
285. right away.  
286. only after they really get to know me.

- H4. In my home life, when I come to the end of some undertaking, I am...
- 287. clear as to what comes next and ready to tackle it.
  - 288. glad to relax until the next inspiration hits me.
- I4. I think that it is important to...
- 289. be able to see the possibilities in a situation.
  - 290. be able to adjust to the facts as they are.
- J4. I feel that the people whom I know personally owe their successes to...
- 291. ability and hard work.
  - 292. luck.
  - 293. bluff, pull and shoving themselves ahead of others.
- K4. In getting a job done, I depend upon...
- 294. starting early, so as to finish with time to spare.
  - 295. the extra speed I develop at the last minute.
- L4. After associating with superstitious people, I have...
- 296. found myself affected by their superstitions.
  - 297. remained unaffected.
- M4. When I don't agree with what has just been said, I...
- 298. let it go.
  - 299. put up an argument.
- N4. I would like to be considered...
- 300. a practical person.
  - 301. an ingenious person.
- O4. Out of all the resolutions I may have made, there are...
- 302. those I have kept to this day.
  - 303. those that have not lasted.
- P4. I would like to work under someone who is...
- 304. always kind.
  - 305. always fair.
- Q4. In a large group, I...
- 306. introduce others.
  - 307. get introduced.
- R4. I would like to have as a friend someone who...
- 308. is always coming up with new ideas.
  - 309. has both feet on the ground.
- S4. When I have to do business with strangers, I feel...
- 310. confident and at ease.
  - 311. fussed or afraid that they won't want to bother with me.

T4. When it is settled well in advance that I will do a certain thing at a certain time, I find it...

312. nice to be able to plan accordingly.

313. unpleasant to be tied down.

U4. I feel that sarcasm...

314. should not be used where it can hurt people's feelings.

315. is too effective a form of speech to be discarded because it can hurt people's feelings.

V4. When I think of some little thing I should do or buy, I...

316. forget it till much later.

317. get it down on paper to remind myself.

318. carry through on it without reminders.

W4. I let my...

319. heart rule my head.

320. head rule my heart.

X4. In listening to a new idea, I am anxious to...

321. find out all about it.

322. judge whether it is right or wrong.

Y4. I am oppressed by...

323. many worries.

324. few worries.

Z4. When I don't approve of the way a friend is acting, I...

325. wait and see what happens.

326. do or say something about it.

A5. I feel it is a fault to be...

327. unsympathetic.

328. unreasonable.

B5. When a new situation comes up which conflicts with my plans, I try first to...

329. change my plans to fit the situation.

330. change the situation to fit my plans.

C5. I think the people close to me know how I feel...

331. about most things.

332. only when I have had some special reason to tell them.

D5. When I have a serious choice to make, I...

333. come to a clear-cut decision.

334. find it so hard to decide that I do not wholeheartedly follow up either choice.

- E5. On most matters, I...  
335. have a definite opinion.  
336. have an open mind.
- F5. As I get to know people better, I find that they...  
337. let me down or disappoint me in some way.  
338. improve upon acquaintance.
- G5. When the truth would not be polite, I am likely to tell...  
339. a polite lie.  
340. the impolite truth.
- H5. In my way of living, I like to be...  
341. original.  
342. conventional.
- I5. I would have liked to...  
343. argue the meaning of these questions.  
344. not argue the meaning of these questions.
- J5. I think that having a daily routine is...  
345. a comfortable way to get things done.  
346. painful even when necessary.



**APPENDIX B**

**DEMOGRAPHIC DATA**

RESEARCH #: \_\_\_\_\_

Age: \_\_\_\_\_

Gender: \_\_\_\_\_

Year in college: \_\_\_\_\_

If you have a declared major, it  
is: \_\_\_\_\_If you don't have a declared major, what are your top two, in  
order of preference, if you had to make a choice?  
\_\_\_\_\_Check this line if you have absolutely no idea right now what  
your major could be in the future. \_\_\_\_\_

Again, thank you for participating in this research project.

**APPENDIX C**

FACTOR STRUCTURE OF THE MYERS-BRIGGS TYPE INDICATOR

FACTOR 1

-.636	S2	73.	a. imaginative b. matter-of-fact
-.620	FX TX	154.	Do you more often let a. your heart rule your head, or b. your head rule your heart
.589	S N2	104.	a. concrete b. abstract
.572	S2 N	102.	a. facts b. ideas
-.566	F2 T2	26.	Are you inclined to a. value sentiment more than logic, or b. value logic more than sentiment
.523	T2 F	114.	a. thinking b. feeling
-.521	J	99.	a. changing b. permanent
.513	S2 N2	128.	If you were a teacher, would you rather teach a. fact courses, or b. courses involving theory
.487	J2 P2	74.	a. systematic b. spontaneous
-.482	E	15.	Do you usually a. show your feelings freely, or b. keep your feelings to yourself
-.476	P2 J	94.	a. impulse b. decision
.458	J2 P2	118.	a. systematic b. casual
.441	T F2	105.	a. justice b. mercy

- .439 S2 98. a. sensible  
b. fascinating
- .423 S 121. a. accept  
b. change
- .375 J2 P 109. a. orderly  
b. easy-going
- .374 S 165. In your way of living, do you prefer to be  
a. original, or  
b. conventional
- .371 E I 160. Do you think the people close to you know how you feel  
a. about most things, or  
b. only when you have had some special reason to tell them
- .367 S N 119. a. literal  
b. figurative
- .367 S2 N2 145. Would you rather be considered  
a. a practical person, or  
b. an ingenious person
- .365 S 90. a. production  
b. design
- .346 T F 81. a. benefits  
b. blessings
- .339 S N2 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
- .324 T 133. Do you feel it is a worse fault  
a. to show too much warmth, or  
b. not to have warmth enough
- .316 N2 S 76. a. theory  
b. certainty
- .312 P J 20. Is it harder for you to adapt to  
a. routine, or  
b. constant change

- .304                    29.    Is it a higher compliment to be called  
                               F            a. a person of real feeling, or  
                               T2           b. a consistently reasonable person
- .283                    97.    a. punctual  
                               J            b. leisurely  
                               P
- .254                    140. Do you think it is more important to  
                               S            a. be able to see the possibilities  
   in a situation  
   b. be able to adjust to facts as  
   they are
- .154                    147. Would you rather work under  
   someone who is  
                               FX            a. always kind, or  
   b. always fair.

## FACTOR 2

- .593                    111. a. gentle  
                               F            b. firm  
                               T
- .593                    72.    a. firm-minded  
                               T2           b. warm-hearted
- .579                    1.     Does following a schedule  
                               J2            a. appeal to you, or  
                               P2            b. cramp you
- .578                    11.    In doing something that many other  
   people do, does it appeal to you more  
   to  
                               S            a. do it in the accepted way, or  
                               N            b. invent a way of your own.
- .561                    103. a. compassion  
                               F            b. foresight  
                               T2
- .531                    113. a. quick  
                               P            b. careful
- .514                    91.    a. forgive  
                               T2           b. tolerate
- .496                    120. a. peacemaker  
                               T2           b. judge

- .495 J2 85. a. scheduled  
P2 b. unplanned
- .467 T2 86. a. convincing  
FX b. touching
- .456 TX 79. a. analyze  
F2 b. sympathize
- .447 T2 89. a. soft  
b. hard
- .439 T2 108. a. wary  
b. trustful
- .420 J2 55. When you go somewhere for the day,  
would you rather  
a. plan what you will do and when,  
or  
P2 b. just go
- .407 J 151. When it is settled well in advance  
that you will do a certain thing at  
a certain time, do you find it  
a. nice to be able to plan  
accordingly, or  
P b. a little unpleasant to be tied  
down
- .402 P2 49. Do you think that having a daily  
routine is  
a. a comfortable way to get things  
done, or  
b. painful even when necessary
- .375 TX 4. Are you more careful about  
a. people's feelings, or  
b. their rights
- .374 I 95. a. speak  
b. write
- .360 T 100. a. determined  
FX b. devoted
- .341 P 142. In getting a job done, do you depend  
upon  
a. starting early, so as to finish  
with time to spare, or  
b. the extra speed you develop  
at the last minute

- .320            27. Do you prefer to  
 J2            a. arrange dates, parties, etc. well  
               in advance, or  
 P            b. be free to do whatever looks like  
               fun when the time comes
- .294           70. Is it higher praise to say someone  
               has  
 N2           a. vision, or  
 S            b. common sense
- .288           13. Do you  
 P            a. rather prefer to do things at the  
               last minute, or  
 J            b. find that hard on the nerves
- .213            64. Would you rather  
 S2           a. support the established methods  
               of doing good, or  
               b. analyze what is still wrong and  
               attack unsolved problems

## FACTOR 3

- .729            50. Are you usually  
 E2           a. a "good mixer", or  
 I2           b. rather quiet and reserved
- .677            134. When you are at a party, do you like  
               to  
 E            a. help get things going, or  
 I2           b. let the others have fun in their  
               own way
- .553           41. Among your friends, are you  
 I            a. one of the last to hear what is  
               going on, or  
 E2           b. full of news about everybody
- .546           106. a. calm  
 I            b. lively  
 E
- .545            92. a. hearty  
 E            b. quiet  
 I2
- .529            126. Can you  
 E2           a. talk easily to almost anyone for  
               as long as you have to, or  
 I2           b. find a lot to say only to  
               certain people or under certain  
               conditions



- .502                    33. Are you  
E                    a. easy to get to know, or  
I2                    b. hard to get to know
- .491                    19. At parties, do you  
I                    a. sometimes get bored, or  
E2                    b. always have fun
- .484                    112. a. foundation  
N2                    b. spire
- .464                    148. In a large group, do you more often  
E2                    a. introduce others, or  
I2                    b. get introduced
- .456                    129. When something starts to be the  
I2                    fashion, are you usually  
a. one of the first to try it, or  
b. not much interested
- .398                    138. Can the new people you meet tell  
E                    what you are interested in  
I                    a. right away, or  
b. only after they really get to  
know you
- .387                    78. a. build  
S2                    b. invent  
N2
- .377                    66. Do you think you get  
E                    a. more enthusiastic about things  
I                    than the average person, or  
b. less enthusiastic about things  
than the average person
- .371                    116. a. sociable  
I                    b. detached
- .337                    87. a. reserved  
E2                    b. talkative
- .304                    6. When you are with a group of people,  
E                    would you usually rather  
I2                    a. join in the talk of the group, or  
b. talk individually with people you  
know well
- .303                    77. a. party  
E                    b. theater
- .290                    117. a. sign  
S                    b. symbol

## FACTOR 4

- .459 9. If you were asked on a Saturday morning what you were going to do that day would you  
 a. be able to tell pretty well, or  
 b. list twice too many things, or  
 c. have to wait and see  
 P  
 P
- .458 2. Do you usually get along better with  
 a. imaginative people or  
 b. realistic people  
 N2  
 S
- .448 60. Does the idea of making a list of what you should get done over a week-end  
 a. appeal to you, or  
 b. leave you cold, or  
 c. positively depress you  
 J  
 P  
 P
- .397 132. When you have a special job to do, do you like to  
 a. organize it carefully before you start, or  
 b. find out what is necessary as you go along  
 J  
 P2
- .395 17. In reading for pleasure, do you  
 a. enjoy odd or original ways of saying things  
 b. like writers to say exactly what they mean  
 S
- .384 153. When you think of some little thing you should do or buy, do you  
 a. often forget it till much later, or  
 b. usually get it down on paper to remind yourself, or  
 c. always carry through on it without reminders  
 P  
 J
- .381 124. Do you find the more routine parts of your day  
 a. restful, or  
 b. boring  
 J
- .381 35. When you start a big project that is due in a week, do you  
 a. take time to list the separate  
 J2

- things to be done and the order of doing them, or  
 b. plunge in
- P
- .368 42. Are you at your best  
 a. when dealing with the unexpected, or  
 b. when following a carefully worked-out plan
- P  
 J
- .315 107. a. make  
 b. create
- S2
- .311 149. 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
- N  
 S2
- .237 158. Do you feel it is a worse fault to be  
 a. unsympathetic, or  
 b. unreasonable
- FX
- .233 53. Do you get more annoyed at  
 a. fancy theories, or  
 b. people who don't like theories
- S  
 N
- .225 115. a. theory  
 b. experience
- N2

#### FACTOR 5

- .451 88. a. statement  
 b. concept
- S2
- .435 122. a. agree  
 b. discuss
- F
- .380 68. In your daily work, do you  
 a. rather enjoy an emergency that makes you work against time, or  
 b. hate to work under pressure, or  
 c. usually plan your work so you won't need to work under pressure
- P  
 J
- .360 47. When you are in an embarrassing spot, do you usually  
 a. change the subject, or  
 b. turn it into a joke, or  
 c. days later, think of what you should have said
- E  
 I2



**APPENDIX D**

## FACTOR STRUCTURE OF THE REVISED-MYERS-BRIGGS TYPE INDICATOR

## FACTOR 1

.636	J	I am at my best when... 88. following a carefully worked-out plan.
.623	J	I think that having a daily routine is... 345. a comfortable way to get things done.
.589	S	250. accept
-.586	J2	Following a schedule... 1. cramps me.
.581	P2	2. appeals to me.
.525	J	The idea of making a list of what I should get done over a week-end... 123. appeals to me.
-.424	P	124. leaves me cold.
-.438	P	125. positively depresses me.
.518	J	I like to... 55. arrange dates, parties, etc. well in advance.
.509	T	170. benefits
.509	S	161. certainty
.501	J	When I have a special job to do, I like to... 272. organize it carefully before I start.
.500	F	252. agree
.489	S2	I like to... 132. support the established methods of doing good.
.486	E	I... 31. show my feelings freely.
.484	J2	When I start a big project that is due in a week, I... 72. take time to list the separate things to be done and the order of doing them.

- .475                    When it is settled well in advance that I  
will do a certain thing at a certain time,  
I find it...  
J                    312. nice to be able to plan accordingly.
- .474                    When I think of some little thing I should  
do or buy, I...  
J                    317. get it down on paper to remind  
myself.
- .447                    F                    171. blessings
- .443                    F                    153. warm-hearted
- .443                    When I go somewhere for the day, I like  
to...  
J2                    113. plan what I will do and when.
- .432                    It is high praise to say someone has...  
S                    146. common sense.
- .427                    If I were a teacher, I would like to  
teach...  
S2                    264. fact courses.
- .414                    S                    188. production
- .413                    E                    240. sociable
- .409                    S2                    204. sensible
- .399                    I am careful about people's...  
T                    8. rights.
- .398                    T                    180. convincing
- .396                    E                    221. lively
- .390                    In doing something that many other people  
do, it appeals to me to..  
S                    22. do it in the accepted way.
- .386                    I...  
T                    54. value logic.
- .384                    T                    231. firm
- .372                    The new people I meet can tell what I am  
interested in...  
E                    285. right away.

- .366 J I...  
27. find that doing things at the last minute is hard on the nerves.
- .366 I2 When I am with a group of people, I like to...  
12. talk individually with people I know well.
- .365 E2 183. talkative  
.364 T It is a compliment to be called...  
60. a consistently reasonable person.
- .359 J 202. punctual
- .332 T 215. foresight
- .321 T 208. determined
- .315 S I think that it is important to...  
290. be able to adjust to the facts as they are.
- .302 E When I am in an embarrassing spot, I...  
98. turn it into a joke.
- .289 J In my daily work, I...  
142. plan my work so I won't need to work under pressure.
- .284 P If I were asked on a Saturday morning what I was going to do that day I would...  
19. have to wait and see.
- .249 T 236. thinking
- .239 I I have...  
119. deep friendships with a few people.
- .186 S2 I would like to be considered...  
300. a practical person.
- .180 E I am...  
68. easy to get to know.

## FACTOR 2

- .595 S 216. concrete
- .580 J2 156. systematic



-.546	J2	178. scheduled
.545	F	214. compassion
		I let my...
.536	F	319. heart rule my head.
-.535	T	320. head rule my heart.
.527	F	237. feeling
-.469	J2	244. systematic
.464	P2	157. spontaneous
		I can...
.456	E2	260. talk easily to almost anyone for as long as I have to.
.452		When I am with a group of people, I like to...
	E	11. join in the talk of the group.
.444	P	203. leisurely
.434		I like to...
	P	56. be free to do whatever looks like fun when the time comes.
.411	P	227. easy-going
-.411	T	152. firm-minded
.405		I get along with...
	N2	3. imaginative people.
.402		It is a compliment to be called...
	F	59. a person of real feeling.
-.397		I am...
	I2	69. hard to get to know.
-.390	J	207. permanent
.380	N2	217. abstract
.374		I would like to have as a friend someone who...
	N	308. is always coming up with new ideas.
-.370	S2	155. matter-of-fact
		I feel it is a fault...

-.362	T	274. to show too much warmth.
-.360	T	249. judge
-.345	T	195. what
		I think the people close to me know how I feel...
.336	E	331. about most things.
-.326	I	332. only when I have had some special reason to tell them.
.304	F	I feel it is a fault to be... 327. unsympathetic.
.303	E	162. party
-.285	P	If I were asked on a Saturday morning what I was going to do that day I would... 18. list twice too many things.
.280	P2	When I go somewhere for the day, I like to... 114. just go.
-.277	I2	When I am in an embarrassing spot, I... 99. days later, think of what I should have said.
-.273	I	241. detached
.214	P2	179. unplanned

## FACTOR 3

		I am...
-.505	E2	102. a "good mixer."
.669	I2	103. quiet and reserved.
.591	I	220. calm
		When I am at a party, I like to...
-.538	E	276. help get things going.
.276	I2	277. let the others have fun in their own way.
.532	F	230. gentle
.512	I2	193. quiet

- .509 I 182. reserved
- .501 I2 I can...  
261. find a lot to say only to certain people or under certain conditions.
- .436 E2 In a large group, I...  
.478 I2 306. introduce others.  
307. get introduced.
- .454 I Among my friends, I am...  
85. one of the last to hear what is going on.
- .365 E2 86. full of news about everybody.
- .432 I At parties, I...  
39. get bored.
- .319 E2 40. have fun.
- .422 F 167. sympathize
- .413 F 181. touching
- .411 I I think that I get...  
137. less enthusiastic about things than the average person.
- .368 F I...  
53. value sentiment.
- .356 F 209. devoted
- .351 I The new people I meet can tell what I am interested in...  
286. only after they really get to know me.
- .345 S In my way of living, I like to be...  
342. conventional.
- .335 F 219. mercy
- .316 S I admire the people who are...  
76. conventional enough never to make themselves conspicuous.
- .303 P 234. quick
- .292 T 187. hard
- .288 I 199. write

.249	E	192. hearty
.223	T	191. tolerate
-.212	P	In my daily work, I... 140. enjoy an emergency that makes me work against time.

## FACTOR 4

.551	S2	212. facts
.489	T	218. justice
.489	N2	If I were a teacher, I would like to teach... 265. courses involving theory.
.485	N	185. concept
.459	T	166. analyze
.459	P	I... 26. prefer to do things at the last minute.
.451	S2	184. statement
.427	S	246. literal
.413	N	In doing something that many other people do, it appeals to me to.. 23. invent a way of my own.
.403	P2	I think that having a daily routine is... 346. painful even when necessary.
.402	P2	When I have a special job to do, I like to... 273. find out what is necessary as I go along.
.392	N	165. invent
.383	E2	I have... 120. broad friendships with many different people.
.372	S	242. sign
		In getting a job done, I depend upon...

- .361 P 295. the extra speed I develop at the last minute.
- When I start a big project that is due in a week, I...
- .350 P 73. plunge in.
- I am at my best when...
- .349 P 87. dealing with the unexpected.
- .346 S2 222. make
- .346 N 213. ideas
- .342 N 247. figurative
- .339 N2 160. theory
- .334 N2 233. spire
- .315 S2 164. build
- It is hard for me to adapt to...
- .314 P 41. routine.
- .212 J 42. constant change.
- When I think of some little thing I should do or buy, I...
- .264 P 316. forget it till much later.
- I find the more routine parts of my day...
- .209 J 256. restful.

#### FACTOR 5

- In reading for pleasure, I...
- .478 S 36. like writers to say exactly what they mean.
- When something starts to be the fashion I am...
- .418 I2 267. not much interested.
- I would like to have as a friend someone who...
- .416 S2 309. has both feet on the ground.
- .400 P2 196. impulse
- .365 N2 238. theory

- .355 N2 It is high praise to say someone has...  
145. vision.
- .354 N In doing something that many other people  
do, it appeals to me to..  
23. invent a way of my own.
- .351 N2 I admire the people who are...  
77. too original and individual to care  
whether they are conspicuous or not.
- .343 S I get along with...  
4. realistic people.
- .335 P2 245. casual
- .329 N2 I would like to be considered...  
301. an ingenious person.
- .318 J 197. decision
- .299 F I would like to work under someone who  
is...  
304. always kind.
- .287 T 224. wary
- .283 I I think that I get...  
the 137. less enthusiastic about things than  
average person.
- .207 N I get annoyed at...  
109. people who don't like theories.

**APPENDIX E**

## FACTOR STRUCTURE OF THE SINGER-LOOMIS INVENTORY OF PERSONALITY

## FACTOR 1

.593	ET	4-31. discuss the need to work out a disaster plan for our own community.
.578	IT	7-49. set up a daily plan to reward myself as I change my behavior.
.518	IS	6-41. thumb through the travel section of the paper and clip articles on likely spots to visit.
.513	IN	4-30. wonder what I would do if I were caught in such a situation
.503	ET	12-95. arrange a telephoning plan to notify relatives and friends.
.498	IS	2-9. relax in the warm glow of well-being.
.487	IT	9-70. check the routes of escape.
.476	IF	4-27. experience it almost as a personal tragedy.
.472	IS	9-72. follow the guidelines issued by the fire department
.468	IN	10-80. explain that I have not done this in the past but should do it now.
.454	IN	5-33. get away from he others and try to figure out what went wrong.
.451	IF	5-39. ask myself if I really want to keep working there.
.449	EF	9-68. fear for the person and rush to the rescue.
.443	ET	10-76. acknowledge to them that because there are both pros and cons to this undertaking, it requires careful consideration
.422	EN	10-78. help them to visualize how it will affect them in the end



- .409 IF 6-42. entertain myself at home with my favorite situation comedy television programs and good music
- .402 IF 13-103. know immediately what would look good on me.
- .399 ES 15-118. explain in detail what the results will be if I do what I have proposed.
- .396 IT 5-38. reflect on how I might change my way of handling things.
- .392 IN 9-65. see all the possibilities for escape and act as fast as I can.
- .383 EN 2-14. speculate on where we might spend our vacation
- .378 EN 3-24. brainstorm with others to envision original ways of raising money for the schools.
- .376 ET 14-108. phone someone to take over and explain exactly what needs to be done.
- .366 IT 1-6. do some of the planning and organizing that I have been putting off.
- .337 IT 13-102. sit down and plan what I need and budget how much to spend on each item.
- .327 IF 1-7. call up the theatre and reserve a ticket for a show I've been wanting to see
- .324 ET 11-83. try to determine ways in which we can reasonably work together.
- .324 ES 12-90. suggest practical ways I can help with the arrangements.
- .322 EF 12-89. be shocked and express my sadness to the person who called.
- .315 ES 9-66. call the fire department immediately and give them my name, address, telephone number, and nearest cross streets.
- .313 IS 1-8. stay home alone and get into one of my hobbies like gardening, painting,

woodworking, music, or yoga.

- .311 IS 4-32. watch with interest all the television coverage.
- .305 EF 3-20. respond to what the students like.
- .302 IT 8-61. be in a position where I could organize my work for maximum efficiency.
- .291 IN 3-23. look at the problems from a variety of perspectives.
- .285 EF 7-52. seek professional help
- .284 ES 8-58. work with a skilled crew building or repairing equipment.
- .279 IN 1-1. imagine what is possible, then wait to see what the day brings before I decide
- .256 EN 14-110. lie there and wonder what is happening where I am supposed to be.
- .205 IF 10-74. stick to my own beliefs no matter what anyone says.
- .203 IT 3-17. clarify my objective and outline a step-by-step progression toward my goals.

## FACTOR 2

- .535 EN 7-56. worry about what other people are thinking of me.
- .483 ES 4-26. advocate a commission to inquire into exactly what occurred and what the situation is now.
- .452 IN 2-16. daydream about the future.
- .450 IN 12-94. begin imagining how this will change my life.
- .438 IN 7-55. wonder if I can change.
- .426 IF 9-71. be frightened for my safety.
- .414 EF 13-100. select something fashionable that will impress my friends.

- .410 EF 4-25. volunteer to contact my neighbors for contributions for relief for the victims.
- .407 ET 1-3. spend part of the day working in a group doing something of importance
- .399 ES 7-54. join a self-help group that records people's progress regularly
- .396 IS 3-21. study carefully the present school budget and course of studies.
- .393 ES 1-2. participate in some sport with other people
- .390 EN 1-5. anticipate going with my group to a benefit for a worth-while charity
- .378 IT 11-81. concentrate my efforts on the project, not the person.
- .376 EN 12-92. wonder what the long-range effects of this person's death will be.
- .334 EF 1-4. try something new with a few friends
- .329 IN 6-48. speculate on where I could live where I would not have to endure this.
- .320 ES 5-34. go with someone for entertainment such as dinner and a show.
- .302 EN 15-120. point out, using many examples, that my friends and other people are doing this.
- .290 IS 5-40. get something to eat and stretch out on the couch.
- .287 IN 13-97. try to picture how I would look in these clothes.

### FACTOR 3

- .495 EF 10-77. want them to appreciate the value of this undertaking
- .474 EN 6-46. play a game like blackjack or poker.

- .474 ET 8-63. be a member of a problem-solving team.
- .450 EN 9-69. try to put out the fire by any means at had.
- .448 ET 5-35. phone a co-worker to discuss the problems that arose during the day, and try to determine together what caused them
- .445 ES 10-79. give them the names of people involved in this to strengthen my position
- .396 IT 12-93. inquire about the funeral arrangements.
- .392 ES 11-86. tell my co-worker what it is like when we work under these conditions.
- .388 IT 6-43. use the time to do some paper work that I should have done long ago.
- .384 EN 5-37. imagine what things could be like at work if we could do some of the things a few of us have talked about.
- .382 IF 12-91. go off by myself and have a good cry
- .383 ET 2-12. use the time to plan our next project and set priorities.
- .370 ET 9-67. determine the source of the fire and take practical measures to put it out-if possible.
- .355 EF 6-45. decide I might as well enjoy it and invite some friends to dinner
- .339 EF 2-13. be especially sensitive to any disturbances in our relationship.
- .329 IF 11-82. keep quiet and leave the situation doing as little damage as possible.
- .280 ET 6-44. start some projects that need to be done around the house and get others to help.
- .263 IS 11-85. recognize each of our skills and divide the labor accordingly.

## FACTOR 4

- .513 IT 4-29. read the paper for further details.
- .438 ES 3-22. work on a fact-finding committee that would check on possible leakage of funds in such places as the cafeteria, bookstore, etc.
- .431 EN 8-60. work in an environment with people who would stimulate each other to be creative.
- .419 IT 10-75. point out to them the possibilities for me if I follow this course of action.
- .419 IT 15-113. consider the other person's arguments and weigh the evidence before I act.
- .416 ET 15-115. present reasons why my position is justified.
- .407 IN 11-87. have great personal difficulty in getting past my objections.
- .392 IS 15-117. gather together all the facts and then point them out.
- .370 IS 14-105. Stay in bed and pay attention to my body.
- .366 IF 14-106. give in to my feelings because it is the right thing to do under the circumstances.
- .335 ET 13-99. consider the salesperson's views before I buy anything.
- .327 ET 7-51. examine what causes me to fall into this pattern
- .317 EF 15-116. modify my position to keep peace in the family.
- .310 EF 11-84. talk with the person to find out how we can get along better.
- .308 IT 14-107. consider the pros and cons of cancelling my commitments.

- .268 IF 8-59. seek a position that feels just right to me.
- .262 IF 15-114. do what seems best to me despite what the other person says.
- .229 EN 11-88. say, "Let's find a way to get it done no matter what."

## FACTOR 5

- .405 ES 6-47. call up some friends to join me in some physical sport.
- .401 IF 2-10. appreciate how wonderful this person is to me.
- .376 ES 14-111. call the doctor to relate my symptoms and recall their history.
- .369 ET 3-19. suggest that we as a group examine the causes of our difficulties and determine what ought to be done about them.
- .365 IF 7-50. become depressed and blame myself.
- .346 IS 7-53. become aware of what I'm doing to my body.
- .343 IS 12-96. recall how the person looked the last time we were together.
- .341 IN 14-112. worry that perhaps some people will think I am not able to do my job and that maybe they will find someone else.
- .338 EF 14-109. ask for a little tender loving care.
- .293 IN 15-119. worry about what might happen if I don't get my way, and try to think up some alternatives.
- .276 IS 13-104. choose something that suits my lifestyle.
- .190 IN 8-62. work independently in a pleasant environment

## FACTOR 6

.467	ES	2-15. help with the dishes and putting the house in order.
-.451	IF	3-18. suggest the kind of activities I would enjoy in my school
.384	IS	8-64. work alone with figures, computers, or other instruments allowing exact methods and answers.
.376	ES	13-98. choose colors that coordinate with what I already own.
-.347	EF	5-36. share with others the things that are bothering me.
-.326	EN	4-28. estimate the high cost to life and property
.252	IT	2-11. read that book I've been meaning to get to.

APPROVAL SHEET

The thesis submitted by Anne M. Bradley has been read and approved by the following committee:

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The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and 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 Master of Arts.

Date

2/21/91

Director's Signature

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