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A Construct Validity Study of the Singer-Loomis Inventory of Personality

Silas Gregory Gilliam
Loyola University Chicago

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A CONSTRUCT VALIDITY STUDY OF THE
SINGER-LOOMIS INVENTORY OF PERSONALITY

by

Silas Gregory Gilliam

A Dissertation Submitted to the Faculty of the Graduate
School of Loyola University of Chicago in Partial
Fulfillment of the Requirements for the Degree of
Doctor of Philosophy

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VITA

The author, Silas Gregory Gilliam, is the son of Silas W. and Eula (Ison) Gilliam. He was born June 29, 1958, in Norton, Virginia.

His elementary education was obtained in the public schools of Wise County, Virginia. His secondary education was completed in 1976 at J. J. Kelly High School in Wise, Virginia.

For his undergraduate studies Mr. Gilliam attended Northwestern University, Evanston, Illinois, between 1976 and 1980. While attending Northwestern, he was elected a member of Phi Beta Kappa in 1979. He received the degree of Bachelor of Arts, with Highest Distinction and Departmental Honors, from Northwestern in June, 1980, with a major in psychology.

In September, 1980, Mr. Gilliam entered the graduate program in clinical psychology at Loyola University of Chicago. In 1982 he was awarded Departmental Distinction on his master's qualifying examination. Mr. Gilliam received a Master of Arts degree in clinical psychology from Loyola in May, 1984. His master's thesis was titled: "Hispanic Subgroup Utilization Patterns at an Inner-City Community Mental Health Center".

During the course of his graduate studies Mr. Gilliam completed clinical externships at Lakeside Veterans' Administration Hospital, the Charles I. Doyle, S. J. Center and Day School, and at Michael Reese Hospital in Chicago, Illinois. From September, 1985 to August, 1987 he completed a two-year predoctoral clinical internship at the Milwaukee County Mental Health Complex in Milwaukee, Wisconsin.

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CHAPTER I

INTRODUCTION

The Singer-Loomis Inventory of Personality, "SLIP", (Singer & Loomis, 1984) is a relatively new measure of Jungian typology, currently published in an experimental edition. Like the more commonly utilized measures of Jungian typology, the SLIP is a self-report, pencil-and-paper inventory which attempts to assess personality functioning in terms of the dimensions introversion - extraversion, thinking - feeling, and sensation - intuition. In Jungian type theory introversion and extraversion are called attitudes, and refer to the prevailing direction of energy used by an individual in orienting him- or herself in the world. Thinking, feeling, sensation, and intuition are labeled as functions. They refer to the psychological processes involved in receiving and processing information.

Jung based his theory of psychological types on the assumption that the functions of thinking and feeling, as well as sensation and intuition, are bipolar opposites in terms of the psychological processes involved. He assumed that as one function of a bipolar

pair becomes more highly developed, the opposing function becomes less well developed. Furthermore, he also considered the attitudes introversion and extraversion to be energetically opposing and mutually exclusive orientations to the world (Singer & Loomis, 1984).

A number of recent Jungian theorists and researchers (for example, Loomis, 1982; Loomis & Singer, 1980; Mahlberg, 1982) have voiced dissatisfaction with the rigid interpretation of Jung's bipolarity assumption that is the basis for the construction of measures of Jungian typology to date. These theorists argue that these measures, by virtue of their forced-choice item formats and procedures for determining type profiles, always force negative correlations between scales reflecting theoretically opposing functions and produce type profiles which always conform to Jung's bipolarity assumption. Recent research evidence and theoretical considerations have suggested that it may be more appropriate to conceptualize the functions as independently ordered rather than ordered by the principle of bipolarity. If this is so, the commonly used measures of Jungian typology do not allow for the accurate depiction of the typological functioning of individuals whose personality structures do not conform

to the bipolarity assumption (e.g., individuals who, through environmental demands and/or psychological growth, have developed both thinking and feeling functions to a very high degree).

The SLIP was developed in response to this criticism of rigid adherence to the bipolarity assumption and its heretofore impact on the measurement of type (Singer & Loomis, 1984). The item format for the SLIP allows for greater independence in the measurement of the Jungian dimensions, and does not force its resulting type profiles to conform to the bipolarity assumption.

Statement of the Problem

Very few studies to date have provided evidence of the construct validity of the SLIP, or that it measures the Jungian constructs it was designed to assess. It is the purpose of this study to further examine the construct validity of the SLIP. This will be done through the utilization of a number of established techniques of construct validation such as described by Anastasi (1976). Analyses of the SLIP's internal consistency and its patterns of correlations with other personality measures will be performed. Analyses of theoretically expected differences in SLIP profiles for

different age groups will be conducted as a means to assess the SLIP's usefulness as a tool to assess and provide suport for certain aspects of its authors' theory of type development. Also, the SLIP's pattern of scale correlations with other measures of Jungian constructs will be examined through the construction of multitrait-multimethod correlation matrices; and the extent to which the SLIP and another very popular measure of Jungian constructs, the Myers-Briggs Type Indicator, agree on Jungian type classfications will be examined. These particular analyses will provide information regarding the nature of association and degree of similarity between the constructs assessed by the SLIP and constructs with the same name assessed by other instruments. They will also provide informaton in regard to the interchangeability between the SLIP and other measures of Jungian type.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

The Structure of Jung's Type Theory

Jung (1931) described his theory of psychological types as "a phenomenology of the psyche, which enables us to formulate a corresponding theory about its structure" (p. 527). It is a structural theory which Jung utilized to account for individual differences in the way people relate to the outer and inner worlds of experience through habitual attitudes, reaction styles, and response tendencies (Quenk & Quenk, 1982). As such, it may be viewed as an approach to understanding individual differences in terms of both cognitive style and character (Singer, 1972; Singer & Loomis, 1984).

The concepts of energetic attitude and psychological function constitute the basis of Jung's type theory. Jung (1921/1971) posited that there are two fundamental energetic attitudes, introversion and extraversion, and suggested that all individuals exhibit one of these attitudes to a greater degree than the other. These energetic attitudes are defined in terms of the prevailing direction of the psychological energy an individual

utilizes in his or her manner of relating to the world. Introversion refers to a preferred orientation to one's inner, subjective reality. The flow of psychological energy is inward, toward the subject, such that inner experience (the world of ideas, impressions, and images) is valued more highly than the outer social and physical world (Quenk & Quenk, 1982). Extraversion is the opposing energetic attitude, in that psychological energy is typically directed toward the objective physical and social world. In extraversion, outer phenomena are more highly valued and more readily responded to than inner processes. Jung considered these two attitudinal preferences to be constitutionally predisposed characteristics. He observed that even in early childhood a preference for one of these modes of relating to others and orienting oneself in the world can be seen (Jung, 1921/1971; Quenk & Quenk, 1982).

In addition to the attitudes, Jung identified two distinct and fundamental modes of perceiving information (sensation and intuition), and two distinct modes of evaluating this information (thinking and feeling). These four functions, theoretically understood as pairs of psychologically opposing tendencies, are frequently depicted in a diagram such as seen in Figure A.

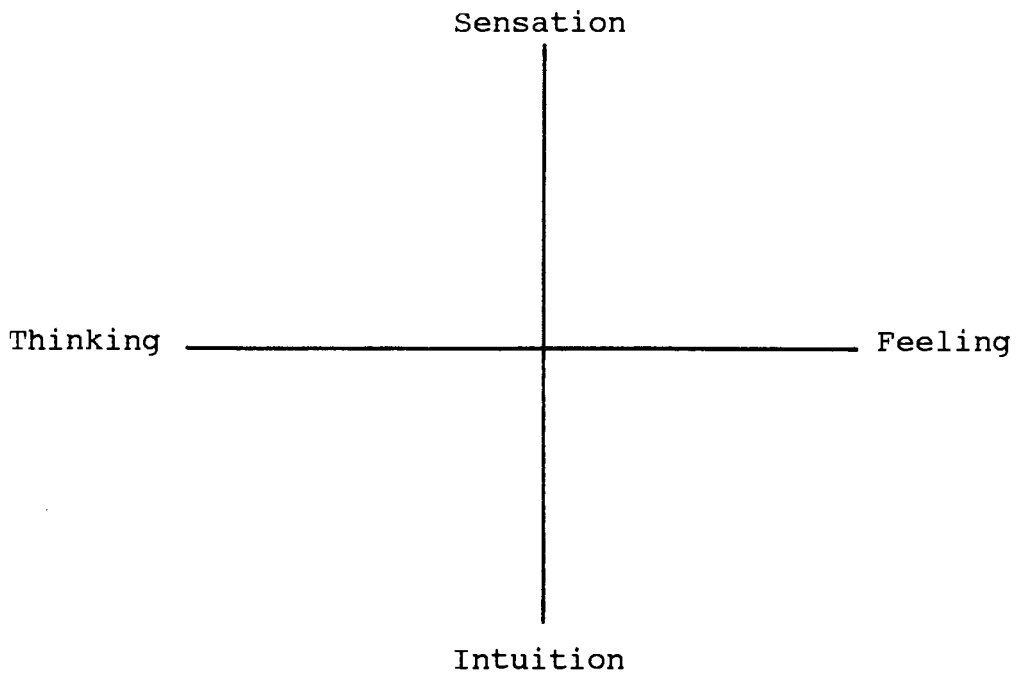


Figure A. Bipolar Representation of the Four Jungian Functions

Sensation and intuition, as the two possible modes of perceiving, are considered to be the irrational functions because the use of these functions does not involve the evaluation or interpretation of information. Rather, these functions operate through the acceptance and registering of the world as it is seen, experienced, or imagined, without value restriction. They are also referred to as the perceiving functions.

The sensation function operates through the five senses, so that the focus is on concrete, tangible reality in the present. Individuals in whose character structure sensation predominates tend to distrust any information or ideas for which they cannot clearly perceive a concrete basis.

Intuition is defined as perception via unconscious processes. This mode of perceiving involves the integration of information received subliminally, either from the physical world or the subjective realm, and the emergence of this information into consciousness in the form of a complete idea or vision of what may be possible. A person who arrives at perceptions via this function is usually unaware of the concrete basis for that perception (Jung 1921/1971; Quenk & Quenk, 1982).

Thinking and feeling, on the other hand, are considered to be the rational functions in that they are

the two possible methods of evaluating and making decisions about the information acquired through one of the modes of perception. Evaluation through the thinking function entails an impersonal, logical appraisal of perception. Decisions made via the thinking function are based on logical analysis.

In contrast to thinking, evaluation through use of the feeling function is not concerned with whether something is logically valid or invalid, but with whether it is important or unimportant in relation to human values and how it affects people. Because thinking and feeling, as modes of processing information and making decisions, involve the evaluation of perceptions, they are also often labelled as the judging functions (Jung, 1921/1971; Quenk & Quenk, 1982).

As was shown in Figure A, the functions have traditionally been considered to be bipolar in nature. That is, each member of a pair has been held to be a psychologically opposing and contradictory process to the other. For example, the use of sensation would automatically make impossible the concurrent use of intuition. Jung's theory does not rule out the possibility that the opposing functions can be exercised consecutively, however, and he points out that no one

uses one attitude or function exclusively (Jung, 1921/1971).

The Derivation of Type

It is possible to define an individual's type simply on the basis of his or her preferred attitude or most highly developed function (e.g., an extraverted type or a thinking type; Myers & Myers, 1980). However, Jung (1921/1971) explained that an individual's habitual and favored use of one of the attitudes, considered in dynamic combination with that individual's most highly developed function, is more meaningful in terms of providing a descriptive definition of that person's type. For example, an individual who is characteristically extraverted and has thinking as his or her dominant function would be considered to be an extraverted thinking type. As can be deduced, the two attitudes can occur in combination with the four functions to form eight possible basic types: introverted thinking, introverted feeling, introverted sensation, introverted intuition, extraverted thinking, extraverted feeling, extraverted sensation, and extraverted intuition.

Jung (1921/1971) concerned himself primarily with the eight basic types in his description of type characteristics. However, he and others (Myers & Myers,

1980; Singer, 1972) also expanded the definition of type to include the roles of the remaining, less highly developed, functions in an individual's character structure. The auxiliary function is defined as an individual's second most developed and utilized function, and is considered to be a "helping" function (Myers & Myers, 1980). According to traditional type theory, if an individual's dominant function is a rational, judging function (thinking or feeling), his or her auxiliary function will necessarily be one of the irrational functions (sensation or intuition), and is the function through which the individual usually takes in the information to be evaluated (Myers & Myers, 1980). Also, the inferior function is defined as the process least available to an individual for conscious use. Traditional type theory postulates that the inferior function is the theoretical opposite of the dominant function (i.e., if the dominant function is thinking, feeling is the inferior function). The significance of the particular ordering and dynamic interactions of the dominant, auxiliary, and inferior functions for personality functioning has been extensively explored by Myers and Myers (1980). When the auxiliary function is included in an individual's type classification, the number of possible type

combinations expands to sixteen (there being two possible auxiliary functions for each dominant function and attitude combination).

Assessment of Type

Current efforts to determine an individual's type through the use of psychological tests are conducted primarily through the use of the Myers-Briggs Type Indicator, "MBTI", (Myers, 1962) and the Jungian Type Survey (JTS), formerly known as the Gray-Wheelwrights' Test (Wheelwright, Wheelwright, & Buehler, 1964). Both are self-report inventories consisting of scales for extraversion - introversion (I - E), sensation - intuition (S - N), and thinking - feeling (T - F). The MBTI also has an additional scale for judging - perceiving, a dimension that was developed to indicate whether a person characteristically uses a perceiving (S or N) or judging (T or F) function when dealing with the outer world. Both the MBTI and JTS also provide a type profile which classifies individuals in terms of preferred attitude (I or E), dominant function, and auxiliary function.

The MBTI has received by far the most acceptance and attention by researchers, and has generated hundreds of studies which primarily attend to the practical utility of understanding an individual's type in

educational and occupational settings (Center for Applications of Psychological Type, 1986). Reviewers of the substantial reliability and validity research conducted with the MBTI (Carlson, 1985; Carlyn, 1977) report satisfactory reliability correlations for the instrument's various scales and favorable support for the instrument's content, predictive, and construct validity.

Much less research has been conducted with the JTS. Woehlke and Piper (1980) reviewed the literature on the JTS, noted the scanty evidence for its reliability and validity as compared to that available for the MBTI, and conducted a factor analysis of the JTS. They identified strong I - E and S - N factors, but a weak T - F factor, and concluded that they had found some support for the construct validity for the instrument. They recommended that the T - F scale be improved by the addition of appropriately weighted items.

Two studies have directly compared the MBTI and JTS (or one of its earlier versions). Stricker and Ross (1964a) administered the MBTI and the 14th edition of the JTS in counterbalanced order to 51 undergraduate men, ranging in age from 19 to 55. All the product moment correlations between the continuous scores for

the corresponding scales on the two inventories were significant ($p < .01$). The instruments' Introversion-Extraversion scales correlated .79, the Sensation-Intuition scales correlated .58, and the Thinking-Feeling scales correlated .60. Bradway (1964), in a study in which she compared the results of the JTS and the MBTI with the self-typing of 28 Jungian analysts, also compared the degree of agreement (in terms of type-concordance percentages) between the two tests. Significant agreements between the two tests were found on all dimensions except the Judging-Perceiving dimension. (Again, the Judging-Perceiving scale is an additional scale devised by Myers (1962) to reflect an individual's predilection to use judging or perceiving functions when dealing with the outside world.) Myers and McCaulley (1985) and Hicks (1984) have asserted that the MBTI and the JTS are very similar and measure essentially the same constructs.

In recent years, however, there has been growing dissatisfaction with both the MBTI and the JTS as measures of Jungian typology, especially among a number of Jungian oriented clinicians and researchers. The source of this dissatisfaction is that both the MBTI and the JTS, by virtue of their forced-choice item format,

force a negative correlation between the paired functions for each item (Singer & Loomis, 1984). Both instruments were developed in strict concordance with Jung's bipolarity assumption of the functions. Thus, MBTI and JTS items are of the format: "At a party, I: a) like to talk; b) like to listen". This forces the respondent to choose a response characteristic of one function and to reject the other. The result is that the type profiles produced by the MBTI and JTS always conform with the bipolarity assumption. If an individual scores highest overall on thinking (his dominant function), then feeling automatically becomes his inferior (and supposedly most undeveloped, least differentiated, and most unavailable) function (Singer & Loomis, 1984).

A number of theorists and researchers have called such rigid adherence to the bipolarity assumption into question on both theoretical and empirical grounds. Jarrett (1972) asks the question, "How opposite is opposite?", when one is speaking in terms of Jung's opposing functions. He calls for a distinction between logical opposition and empirical opposition, arguing that while thinking and feeling, for example, may be empirical opposites in the sense that they rarely occur

together, it is not logically inconceivable that thinking might happen in the same person at the same time with feeling. Jarrett (1972), Loomis and Singer (1984), and Metzner, Burney, and Mahlberg (1981) all point out that inherent in Jungian theory is the idea that through the individuation process (which for the purposes here may be briefly defined as a process through which increasing psychological awareness, wholeness, and maturity are achieved) the eventual union of, or transcendence of, opposing trends in the psyche can be achieved. Applied to Jung's theory of types, this idea would imply that individuals who, for example, naturally may have extraverted thinking as their dominant attitude and function may also come to achieve the ability to utilize introverted feeling (their inferior attitude and function) in a highly developed manner. For this reason Loomis and Singer (1980) argue that while they do not disagree with Jung's assumption that the two pairs of functions have opposing tendencies, they do disagree with the conclusions implied through the construction of the MBTI and JTS, namely, that it is impossible for individuals to transcend the bipolar opposites under any conditions. They argue that in the case of an individual who might

have the ability to use both thinking and feeling in a highly differentiated, adaptive manner, the MBTI and JTS results for that individual might be highly distorted.

Some empirical evidence exists which seems to discredit the bipolarity assumption, as reflected in the MBTI and JTS, as well. Stricker and Ross (1964b) argued that if there are qualitatively different kinds of people, as Jung's typological system suggests, and if individual test items each pit alternatives designed to attract one type or the other against one another, as each scale of the MBTI does, then the true score distributions of each scale should be bimodal. Hence, insofar as the obtained scores reflect the true scores, the obtained score distributions also should be bimodal. Stricker and Ross administered the MBTI to 21 samples which included groups of high school, college, and graduate school students, recently employed college graduates, and public school teachers. Samples varied in size from 60 to 2,389. They inspected the frequency distributions of scores on each of the four MBTI scales from the samples for bimodality. They found none of the distributions to exhibit any marked evidence of bimodality, although there was considerable skewness. Stricker and Ross saw this as offering little support

for the structural properties attributed to Jungian typology, i.e., the existence of dichotomous types. They acknowledged, however, that attempts to identify underlying types from bimodalities in distributions have statistical and theoretical limitations which cast doubt on the usefulness of this approach.

Employing a different kind of scaling method, Cook (1980) utilized Q-sorts of items taken directly from Jung's own descriptions of the eight basic types. He hypothesized significant negative correlations between the pairs of Jungian opposites and found them in three of the four pairs (there was no negative correlation between extraverted feeling (EF) and introverted thinking (IT)). However, equally significant, and at times much larger negative correlations were found between other pairs as well. Thus, EF was correlated $-.35$ with introverted sensation (IS), $-.32$ with introverted intuition (IN), and $-.23$ with introverted feeling (IF) (and not at all with the expected IT). Extraverted thinking (ET) was correlated $-.37$ with IN, $-.35$ with IS, and $-.28$ with IF (the expected). Extraverted intuition (EN) was correlated $-.39$ with IF and $-.37$ with IS, and extraverted sensation (ES) correlated $-.49$ with IN (the expected), but also $-.30$ with IF. These findings were considered by Cook to be

strong evidence against the assumed bipolarity of functions as usually conceived. Cook's general conclusion was that introversion - extraversion (I-E) appears to be a genuinely bipolar continuum, whereas the functions are not.

Mahlberg (1982), again with a different kind of scaling method, also critically examined the assumption that the four psychological functions are necessarily structured by the principle of bipolarity. An alternative measure of Jungian typology, which Mahlberg named the Self-Descriptive Inventory (SDI), was constructed to test for bipolarity by measuring the functions independently with a Likert format. This inventory asked subjects to determine how accurately 120 trait statements described their behavior. Mahlberg administered the SDI, along with either the JTS or the MBTI to 207 introductory psychology students. His hypotheses, derived from Jungian theory, were that the traditionally paired functions would be negatively correlated and that the dominant and inferior functions would be paired functions in 99 percent of the cases. These hypotheses were not supported. Pearson correlations between the paired functions were all found to be positive, and in almost all instances,

significantly so. Dominant and inferior functions were Jungian pairs at proportions significantly less than 99% ($p < .001$). For sensation and intuition he found that if one of the function pair was dominant, the other was the inferior function for 36% of the men (12 out of 33) and also 36% of the women (16 out of 45). With regard to thinking and feeling, he found that when either of the pair was dominant, the opposite function was inferior for 57% of the men (17 out of 28) and 40% of the women (25 out of 63). Mahlberg concluded that the dominant-inferior pairings suggest that the functions are independently ordered rather than ordered by the principle of bipolarity.

Through yet another route Bradway and Wheelwright (1978) found evidence supportive of the idea that the functions may not necessarily be structured by the bipolar principle. They discovered that a sizable minority of Jungian analysts have typed themselves in ways that violate Jungian theory. In a study of the relationship between analyst type and technique employed in therapy, Bradway and Wheelwright found that nearly 25% of the analysts reported inferior functions that were not opposites of the reported dominant functions. Bradway and Wheelwright commented thusly on these

findings: "We have heard analysts argue as to whether this is possible in personality structure. Some insist that it is not, whereas others insist that whether or not it is consistent with theory, it is consistent with their subjective experience" (p. 207).

Loomis and Singer (1980) tested the bipolarity assumption by directly altering the structure of the MBTI and JTS. They, like Mahlberg, attempted to measure the functions independently without forcing a negative correlation between opposing functions as the MBTI and JTS do. Loomis and Singer argued that if the bipolarity assumption is universally valid, the opposition of the dominant and inferior functions should be demonstrable, regardless of the construction of test items. Further, they reasoned that if the profiles obtained by the JTS and MBTI are not partially artifacts of the forced-choice items, then changing the construction of the items should not change the profiles. Loomis and Singer rewrote the forced-choice items of the JTS and MBTI so that their items became two scaled items (double weighted items in the MBTI scoring system were replaced by four scaled items), separated in the tests. Each item was rated by subjects on a scale from 1 to 7 ("never" to "always"). One hundred and twenty subjects

were administered the original and rewritten version of the JTS, with no specified order. Seventy-two percent of these subjects changed their dominant function from one questionnaire to the other. Moreover, in the JTS revised version, 55% of the subjects did not obtain an inferior function that was the hypothesized opposite of their dominant function. Seventy-nine subjects were administered the original and rewritten versions of the MBTI. Of these, 46% did not maintain their dominant function across the inventories, and in the revised version 36% did not evidence the hypothesized dominant-inferior opposition in their profiles. Loomis and Singer suggested from this that some significant distortions of personality functions were being manifested in the inventories currently in use because of their forced-choice formats. They argued that the results did not mean that Jung's theoretical opposition of functions is incorrect, but rather that in some cases personality profiles show that the opposition of functions is reflected in individual cognitive styles and personality characteristics, but that in others the functions may be relatively independent. They concluded that in order to assess whether an individual's type profile conforms to the pattern of bipolar opposites or

deviates from it, it appears that what is needed is an inventory based upon the principle of independent choice, rather than a forced-choice principle.

The Singer-Loomis Inventory of Personality (SLIP)

The theoretical arguments and empirical evidence reviewed above led Singer and Loomis (1984) to develop and publish the Singer-Loomis Inventory of Personality (SLIP). As a new measure of Jungian typology the authors consider the SLIP to be unique. They state in the manual:

The SLIP is unique in a number of ways. It utilizes a situational format that addresses the issue of whether personality is best measured by either an underlying trait, the environmental situation, or both. The situational format allows personality to be measured by the emotional set of the situation while preserving behavioral-trait correspondence as a specific frame of reference. The SLIP contains no bipolarity. The eight Jungian cognitive modes are measured independently, meaning that two modes considered to be opposite could both be high. This lack of bipolarity allows any function or set of functions to be well-developed, as may be reflected in an individual's unique personality (Singer & Loomis, 1984, p. 1).

The SLIP is composed of fifteen situations with eight alternative ways to respond to each situation. Each of these alternative responses reflects a different Jungian pairing of attitude and function (IF, IT, EF, ET, IS, IN, ES, EN), which Singer and Loomis label cognitive modes. After reading each situation

subjects rate each alternative response on a scale of 1 to 5 ("never" to "always") to reflect what they would actually do in such a situation. The response items were constructed from statements based upon Jung's descriptions of the eight basic types such that each cognitive mode is measured in terms of its own parameters, and not with reference to its theoretically opposing cognitive mode. Introverted feeling items, for example, were constructed on the basis of a theoretical dimension involving internally oriented, value-based judgements of like-dislike. Items reflecting poorly developed extraverted thinking were not included among the items on the IF scale. The following is an example of one of the test situations with its eight alternative responses:

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)

The SLIP produces 16 scales. The eight basic cognitive modes constitute the basic scales; their scores are achieved by simply summing subjects' ratings for the eight alternative responses across all fifteen situations. Singer and Loomis recommend converting these raw scores into percent scores for the purpose of profile interpretation. Note that this makes the SLIP's basic scale scores purely ipsative. Scales reflecting the two Jungian attitudes, the four primary functions, and judging and perceiving are derived by combining the appropriate basic scales.

The SLIP as currently published is the third version of the instrument. Most of the published work on the SLIP's reliability and validity is from research on the earlier two versions. This third version reflects revisions deemed appropriate from the results of those earlier studies.

Reliability of the SLIP

The manual reports coefficient alpha reliabilities for the eight basic scales, conducted on a sample of

1188 subjects who took the second version of the SLIP, ranging from a low of .56 for introverted feeling to a high of .71 for extraverted sensation. The coefficient alpha reliabilities for the four functions ranged from .73 for feeling to .80 for both thinking and sensation. Introversion had a reliability coefficient of .85 and extraversion a reliability coefficient of .88. Judging and perceiving showed reliabilities of .86 and .85, respectively.

Criterion-Oriented Validity

In regard to criterion validity Loomis (1980), using the first version of the SLIP, computed mean factor scores for 51 artists and 37 psychotherapists. Psychotherapists were found to have significantly higher scores than artists for extraverted thinking, introverted intuition, and extraverted intuition. Loomis interpreted these results as reflecting an expected need for therapists to be more intuitive than artists. The psychotherapists' higher scores for extraverted thinking was not expected, and not easily explainable.

Loomis and Saltz (1984), also using the original version of the SLIP, investigated the relationship between cognitive style and artistic style in a sample

of 45 professional artists. Extraverted artists, as expected, produced figurative, representational art. Introverted artists produced nonfigurative, abstract art. Art that incorporated recognizable elements and art that was arranged in conformance to rational expectations was likely to be done by those artists whose cognitive styles were dominated by a judging, organizing function. Art which was considered to incorporate unusual elements and art which was arranged unpredictably was likely to be the work of artists whose cognitive styles were dominated by a perceptual function. Loomis and Saltz reported that these results provided support for the constructs of introversion and extraversion as measured by the SLIP. They also concluded that these results supported the SLIP's assessment of the judging functions (thinking and feeling) and the perceptual functions (sensation and intuition).

The Bipolarity Assumption and the SLIP

Two studies examining the type profiles produced by the SLIP have been conducted. Loomis (1980), analyzing the profiles obtained by the sample of artists and psychotherapists described above, found that approximately 25 percent of that sample did not obtain an inferior function that was the bipolar opposite of

their dominant function. Mosher (1985), however, found that in a sample of university undergraduates most of them did have type profiles which conformed to Jung's bipolarity assumption. The authors of the SLIP did not find Mosher's results surprising. They reasoned that it is expected that young adults would be at a developmental stage in which they still relied most heavily upon their constitutionally determined dominant functions, and would not have begun to differentiate and develop their inferior functions (Loomis, 1987, personal communication).

Construct Validity

With respect to the SLIP's construct validity, Singer and Loomis report in the manual the results of two factor analyses of the SLIP, utilizing the sample of 1188 subjects who took the second version of the instrument. The first of these analyses utilized the Alberta General Factor Analysis Program, which analyzed the sample in both total and split halves for principal components. The second analysis is described in the manual as a principal components factor analysis. The results for both analyses were virtually identical. Four factors emerged, two of which were considered to be rational, judging factors, and two of which were

considered non-rational, perceptual factors. All factors consisted of approximately equal numbers of introverted and extraverted items, and were labelled Judging (Reflective), Judging (Active), Perceptual, and Perceptual (Affective). Combined, these factors accounted for only 27 percent of the variance. Singer and Loomis report that these factors are in accord with Jungian theory and give indirect support to the construct validity of the four functions as measured by the SLIP. While they give examples of items with high loadings on each factor, it is somewhat difficult to understand how Singer and Loomis came to label the factors in the way they did.

Also relevant to the SLIP's construct validity are studies conducted by Evans (1985) and Hurley and Cosgro (1986). Evans found that SLIP-classified extraverts appear to place more importance on dreams than do SLIP-classified introverts. This finding has been substantiated by other research using different instruments to measure introversion and extraversion (Loomis, 1987, personal communication). Hurley and Cosgro, using a sample of 117 university undergraduates, correlated the SLIP's various scales with the 18 scales of the Interpersonal Check List (ICL) developed by LaForge and Suczek (1955). A large number of

significant correlations were obtained which, while not always easily explainable, did lead Hurley and Cosgro to conclude that the SLIP may have some utility as an interpersonal measure. Singer and Loomis (Loomis, 1987, personal communication) found some of Hurley and Cosgro's results to be quite supportive of the construct validity of the SLIP scales. Both Extraverted Thinking and Introverted Thinking were found to be negatively correlated with the ICL's Rebelliousness scale, which suggests that the operations involved when one is using the thinking function are more deliberate and independent than reactionary and nonconforming. Also, Extraverted Feeling correlated positively with the ICL's Self-effacing dimension. Singer and Loomis consider this to be an expectable finding, in that extraverted feeling types would be expected to value others' wishes and demands more highly than their own.

Further support for the SLIP's construct validity was found in the results of a study of the validity of the SLIP Interpretive Guide, conducted by Singer and Loomis (Loomis, 1987, personal communication). One hundred and forty SLIP workshop participants described themselves by agreeing or disagreeing with a set of statements abstracted from the SLIP Interpretive Guide and then completed the SLIP itself. These self-

descriptions were compared to scale scores derived from their profiles to determine the degree of congruence between them. The overall validity of the Interpretive Guide was found to be 74 percent (statements drawn from the Guide were congruent with the SLIP scale scores three out of four times). Agreement ranged from a high of 88 percent for the intuition description to an obtained low of 59 percent for the perceiving descriptions.

Singer and Loomis (1984) report that in constructing the third version of the SLIP each item was evaluated for item-total correlations on orientation (extraversion or introversion), function (T, F, S, N), and cognitive mode (the SLIP's basic scales). They report that each item was also examined for its factor loading in the principal components analysis and on a Procrustes factor analysis that was performed. Using these criteria, items were rewritten if the item-total correlations were below .20 or if the factor loadings were low or incompatible. In some cases items were relabelled if they proved to measure one cognitive mode more than the one for which it was originally intended. The authors do not report any factor analyses performed after this process of revision.

Hypotheses

It is the purpose of this study to further evaluate the construct validity of the SLIP. Six major hypotheses are advanced:

1. It is hypothesized that the SLIP item-scale correlations as reported by the authors are stable, such that item-total correlations will not be lower than .20 and that each item will correlate most highly with the scale it is intended to reflect. SLIP item-total correlations for the SLIP's 16 scales thus will be performed for the sample in this study as a means to examine the internal consistency of the SLIP's scales.
2. It is hypothesized that the SLIP's basic scales do reflect their intended constructs and thus will exhibit a theoretically congruent pattern of intercorrelations. Statistical independence is not expected to be found, for the "blended" nature of the scales does not allow for this. However, it is expected that those basic scales which share an attitude or function dimension (e.g., ET and IT) will exhibit higher intercorrelations than those which do not (e.g., ET and IF).

3. It is hypothesized that with increasing age, SLIP respondents will exhibit a significantly lesser tendency to obtain type profiles in which the designated inferior cognitive mode is the theoretical bipolar opposite of the dominant cognitive mode. This hypothesis is derived from the theoretical proposition that with increasing psychological maturity many individuals develop their inferior functions and thus "transcend" the tension between opposing aspects of their personalities. For the purposes of this study, age will be used as a crude index of psychological maturity. Previous measures of Jungian type have not allowed an easy examination of this theoretical developmental process.

4. It is hypothesized that the SLIP and MBTI measure highly similar constructs. This hypothesis will be investigated through the construction of a multitrait-multimethod correlation matrix such as described by Campbell and Fiske (1959). The SLIP and MBTI will be treated as different methods, and it is expected that their corresponding scale intercorrelations will show convergent and discriminant validity coefficients of appropriate direction and size.

While no formal major hypothesis will be advanced, it will be of considerable interest in this study to

explore the degree to which the SLIP and MBTI agree on their classifications of attitude, function, and basic Jungian type. Because of their very different approaches it is not seen as likely that very high levels of agreement would occur, but it would seem that substantial agreement at least on the classification of fundamental attitude (introverted vs. extraverted) and basic type would occur if the two instruments assess highly similar constructs.

5. It is hypothesized that the SLIP and MBTI scales will exhibit highly similar profiles of correlations with the conceptually distinct constructs represented by the eight basic personality style scales of the Millon Clinical Multiaxial Inventory, "MCMI", (Millon, 1983). The basis of this hypothesis is the same as that of Hypothesis (4), that the SLIP and MBTI measure highly similar constructs. It is reasoned that if the comparable SLIP and MBTI scales reflect highly similar constructs, their patterns of intercorrelations with other constructs will be very similar. This method of assessing the construct validity of personality measures is described by Fiske (1973), and is considered to be an extension of the convergent-discriminant validation method of construct validity for tests of personality

constructs (Anastasi, 1976). If this study finds considerable discrepancies between the SLIP and MBTI's profiles of correlations with the MCMI's personality style scales (above and beyond what might be attributable to method variance), the theoretical relevance and congruence of the obtained correlations will provide a useful tool in the logical analysis of the construct validity of the SLIP.

6. It is hypothesized that the introversion and extraversion scales of the SLIP and Eysenck Personality Questionnaire-Revised, "EPQ-R", (Eysenck & Eysenck, 1975; Eysenck, Eysenck & Barrett, 1985) measure highly similar constructs, and thus, that the two measures' scale intercorrelations will show convergent and discriminant validity correlations of appropriate direction and size.

CHAPTER III

METHOD

Subjects

A total of 234 subjects participated in this study. One hundred and sixty-four of these subjects (82 men and 82 women) were volunteer undergraduates from a large private university in Chicago, Illinois, who participated in this study as a way to fulfill introductory psychology course requirements. The 70 subjects from older age groups (21 men and 49 women) were recruited from a variety of sources. Announcements for older volunteers were placed in the newsletters of two of the university's graduate professional programs (the School of Social Work and the Institute of Pastoral Studies). In addition, these subjects were recruited from undergraduate and graduate programs whose enrollments included a sizeable number of students in their thirties and forties (the undergraduate applied psychology and the graduate nursing programs). Other volunteer subjects from older age groups were recruited from a weekend workshop on Jungian typology sponsored by the university's Institute of Pastoral Studies. The

investigator also recruited volunteer subjects from older age groups from the network of families and friends of his acquaintances. No personal acquaintances of the investigator participated. Table 1 presents the demographic characteristics of all subjects and a breakdown by recruitment source.

Instruments

Myers-Briggs Type Indicator (MBTI)

The MBTI (Myers, 1962) is a forced-choice, self-report inventory which was developed to measure the variables in Jung's personality typology. Its Form G was first published in 1977 and contains 126 items. The MBTI consists of four bipolar scales: Extraversion-Introversion (E-I); Sensation-Intuition (S-N); Thinking-Feeling (T-F); and Judgement-Perception (J-P). By using these four indices together 16 types can be generated. The item format is such that items representing a given bipolar scale are never paired with items representing another bipolar scale. For scoring purposes the response alternatives are weighted 0, 1, or 2 points. These weights were determined in accord with the "evidential value" of the alternatives to offset social desirability bias (Myers, 1962, p. 86). Points are summed for each pole of the dimensions and the person is

Table 1

Subject Demographic Characteristics and Recruitment Source

Recruitment Source	Age	<u>n</u>	Sex	<u>n</u>	Education	<u>n</u>	Ethnicity	<u>n</u>
Undergraduate	17-19	138	Males	82	Some College	164	Caucasian	125
Introductory	20-29	22	Females	82			Black	7
Psychology Course	30-39	2					Hispanic	8
Students	40-49	2					Asian	11
(<u>N</u> = 164)							Other	13
Institute of	20-29	2	Males	8	Some College	1	Caucasian	23
Pastoral	30-39	6	Females	16	B.A./B.S.	10	Am. Indian	1
Studies	40-49	13			M.A./M.S.	11		
(<u>N</u> = 24)	50-59	2			Ph.D.	2		
	60-69	1						
Institute of	30-39	4	Males	5	B.A./B.S.	11	Caucasian	14
Pastoral	40-49	9	Females	11	M.A./M.S.	4	South Sea	
Studies	50-59	1			Ph.D./J.D.	1	Islander	2
Typology Workshop	60-69	2						
(<u>N</u> = 16)								

(continued)

Table 1 (continued)

Recruitment Source	Age	<u>n</u>	Sex	<u>n</u>	Education	<u>n</u>	Ethnicity	<u>n</u>
Graduate School of Social Work (<u>N</u> = 4)	30-39	4	Males	1	B.A./B.S.	2	Caucasian	4
			Females	3	M.A./M.S.	2		
Graduate Nursing Program (<u>N</u> = 2)	30-39	1	Males	0	B.A./B.S.	1	Caucasian	2
	40-49	1	Females	2	Ph.D.	1		
Undergraduate Applied Psychology Program (<u>N</u> = 5)	20-29	2	Males	0	Some College	4	Caucasian	5
	30-39	3	Females	5	M.A./M.S.	1		
Others (<u>N</u> = 19)	20-29	4	Males	7	Some College	4	Caucasian	19
	30-39	12	Females	12	B.A./B.S.	10		
	50-59	3			M.A./M.S.	4		

(continued)

Table 1 (continued)

Recruitment Source	Age	<u>n</u>	Sex	<u>n</u>	Education	<u>n</u>	Ethnicity	<u>n</u>
Total (<u>N</u> = 234)	17-19	138	Males	103	Some College	173	Caucasian	192
	20-29	30	Females	131	Ph.D./J.D.	4	Black	7
	30-39	32			M.A./M.S.	23	Hispanic	8
	40-49	25			B.A./B.S.	34	Asian	11
	50-59	6					Other	14

assigned to the pole which has the higher sum. Preference scores, designed to reflect strength of preference, are calculated for each assigned dimension. Continuous scores for each bipolar dimensions are easily derived through a linear transformation of the preference scores.

Test-retest reliabilities for the continuous scores of the four scales of Form G have been shown to be high, ranging from .77 (T-F scale) to .89 for the J-P scale (Carlson, 1985). Intercorrelations of the continuous scores from Form G show that the dimensions E-I, S-N, T-F, and J-P tend to be independent of each other, except that S-N and J-P tend to be significantly and positively correlated (Myers & McCaulley, 1985).

Fairly substantial evidence for the construct validity of the MBTI's scales and classifications has accumulated over the years (Carlson, 1985; Carlyn, 1977). For example, individuals scoring high on MBTI Extraversion tend to exhibit preferences for action, gregariousness, impulsiveness, and talkativeness on scores from other tests (Myers, 1962; Webb, 1964), and behaviorally have been shown to prefer less physical distance from others, to exhibit more talkativeness, and to exhibit better recall of other person's names

(Carskadon, 1979). MBTI introverted types appear to prefer to reflect before acting and they enjoy working alone. They score high on scales of self-sufficiency and are rated by faculty as more solitary and less carefree than MBTI extraverts (Carlyn, 1977).

MBTI Thinking correlates highly with such constructs as autonomy and order (Myers, 1962), and individuals classified by the MBTI as thinking types tend to value the theoretical, logical, and objective aspects of situations (Myers, 1962; Stricker & Ross, 1964a). MBTI Feeling tends to correlate positively with measures of nurturance and affiliation (Myers, 1962).

MBTI Sensing has been related to a preference for facts and tangible stimuli, and correlates particularly highly with measures of practicality (Carlyn, 1977). MBTI Intuition correlates with creativity, intelligence, autonomy, and with aesthetic and theoretical values. MBTI intuitive types seem to prefer the abstract and can tolerate ambiguity (Myers, 1962).

MBTI perceptive types have been associated with spontaneity, impulsiveness, flexibility, and tolerance for complexity. MBTI judging types are associated with dutifulness, dependability, control, and needs for order and endurance (Carlyn, 1977; Stricker & Ross, 1964a; Webb, 1964).

Millon Clinical Multiaxial Inventory (MCMI)

The MCMI (Millon, 1983) is a 175 item true-false instrument which assesses enduring personality styles, pathological personality patterns, and acute symptom disorders. Each of its 20 scales was constructed as an operational measure of a personality pattern or clinical syndrome derived from a comprehensive theory of personality and psychopathology which emphasizes the interaction of biogenic, psychogenic, and situational determinants of behavior (Millon, 1973, 1981). The sophisticated procedures by which item selection, scale development, and external validity were established have led a number of reviewers to consider the instrument's scales highly reliable and well-validated (Hess, 1985; McCabe, 1984; Widiger, 1985).

The MCMI's eight basic personality scales produce scores for Schizoid-Associal, Avoidant, Dependent-Submissive, Histrionic-Gregarious, Narcissistic, Antisocial-Aggressive, Compulsive-Conforming, and Passive-Aggressive (Negativistic) personality styles.

The Schizoid-Asocial scale was designed to measure a personality style noted by social isolation, deficits in energy and pleasure seeking, and a generalized behavioral apathy.

The Avoidant scale reflects a personality pattern characterized by social anxiety and withdrawal, self-alienation, and depressive affect.

The Dependent-Submissive scale reflects a personality pattern characterized by an inadequate and fragile self-image, social passivity, and deficits in autonomy and assertiveness.

The Histrionic-Gregarious scale taps personality traits such as sociability, attention seeking, defensive denial, impulsiveness, and social irresponsibility.

MCMI Narcissistic measures a personality style characterized by exaggerated self-assurance, interpersonal exploitiveness, and a deficient social conscience.

The Antisocial-Aggressive scale reflects traits such as hostile affectivity, fearless and aggressive assertiveness, social domination, and vindictive projection.

The Compulsive-Conforming scale was designed to measure a personality style characterized by a respectful adherence to convention, restrained hostility, denial of personal deficits, and a generalized rigidity.

MCMI Passive-Aggressive (Negativistic) was a scale

constructed to measure self-discontent, labile moodiness, and interpersonal contrariness.

While not generally intended for use with nonclinical populations, the MCMI has been administered to nonclinical populations for normative purposes (Millon, 1983). The MCMI is believed to be particularly interesting for the purposes of this study because its eight basic personality scales assess trait clusters which reflect overall patterns of personality functioning, as opposed to unitary traits.

Using a nonclinical version of the MCMI (no longer available) Wagner (1981) correlated both MBTI raw scale scores and MBTI continuous scale scores with the eight basic personality scales. He found the MBTI and MCMI scale intercorrelations to exhibit theoretically congruent, statistically significant relationships in almost all comparisons. MBTI I exhibited significant positive correlation coefficients of at least .60 with MCMI Asocial and Avoidant. MBTI E exhibited significant positive correlations of at least .30 with MCMI Gregarious, Self-Assured (Narcissistic), and Assertive (Aggressive). MBTI S correlated positively and significantly with MCMI Disciplined (Conforming) ($r = .49$). MBTI N positively correlated with MCMI Gregarious

and Self-Assured (Narcissistic) with r 's of at least .25. MBTI T exhibited a significant r of .30 with MCMI Assertive (Aggressive), and MBTI F exhibited a significant r of .38 with MCMI Cooperative (Submissive). MBTI J correlated positively and significantly with MCMI Disciplined-Conforming ($r = .54$), while MBTI F correlated most highly with MCMI Gregarious ($r = .22$).

Eysenck Personality Questionnaire-Revised (EPQ-R)

The EPQ-R (Eysenck & Eysenck, 1975; Eysenck, Eysenck, & Barrett, 1985) is a 100 item "yes - no" questionnaire developed to assess three fundamental dimensions of personality: extraversion - introversion, neuroticism (or emotionality), and psychoticism (or toughmindedness). The EPQ-R consists of three scales which reflect these dimensions (E, N, and P, respectively), plus an additional scale (the Lie scale 'L') which was developed to reflect a tendency on the part of some respondents to "fake good". The authors report that in addition to the tendency to dissimulate, the L scale appears to reflect some stable personality factor related to social naivete. All the scales were derived from factor analytic studies.

EPQ-R scale E is considered to reflect sociability, impulsivity, excitement-seeking,

aggressivity, and optimism (Eysenck & Eysenck, 1975).

The authors describe a high scorer on scale N as "an anxious, worrying individual; moody and frequently depressed . . . his main characteristic is a constant preoccupation with things that might go wrong and a strong emotional reaction of anxiety to these thoughts" (Eysenck & Eysenck, 1975, p. 5). Low scorers on scale N are described as stable individuals who tend to respond emotionally only slowly and generally weakly. They generally tend to be calm, even-tempered, controlled, and unworried.

High scorers on EPQ-R scale P are described by the authors as solitary, undersocialized, and perhaps cruel or inhumane. High P scorers, the authors report, tend to be hostile, lacking in empathy, impulsive, and aggressive. They may be thrill-seekers who have an inappropriate disregard for danger.

Test-retest reliabilities reported in the manual range from .71 for the P scale to .87 for the E scale.

Although Eysenck (1973) has been critical of Jungian typology and the subjectivity of Jung's formulations, Steele and Kelly (1976) have provided a demonstration of the convergent and discriminant validities of the original EPQ and the MBTI which

suggest that the extraversion-introversion scales on the two instruments measure highly similar constructs. The EPQ E and the MBTI E-I scales correlated highly and significantly ($r = .74$, $p < .001$), and the correlation between these two scales was significantly greater than any other correlation in the matrix.

Procedure

All subjects were administered the SLIP, MBTI (Form G), MCMI and EPQ-R in counterbalanced order, and were given each measure's standard instructions. The time required to complete the measures ranged from one and one-half to two hours. All response forms were scored manually by the investigator.

The introductory psychology course undergraduates completed the measures in small groups. Each of these subjects signed a research consent form which provided assurances of confidentiality and of his or her freedom to discontinue participation in the study at any time without penalty. After completing the measures each of these subjects was provided a written description of the nature of the study and was given the opportunity to ask questions. Appendix A presents the research consent form and debriefing statement which were utilized.

The subjects from the older age groups completed

the four measures either in small groups at the university or individually. Each of these subjects was provided a completed MBTI report form which explained his or her MBTI results, and was given his or her SLIP results. Cautionary statements were provided about the relative lack of construct validity for the SLIP. Each of these subjects was also provided the opportunity to discuss his or her results with the investigator and to receive more information about type theory.

Pearson product moment correlation coefficients were computed for all the correlational analyses relevant to major hypotheses 1, 2, 4, 5, and 6. Raw score distributions of the SLIP scales were used in order to avoid the statistical and interpretive limitations involved when correlations with purely ipsative scores are performed (Anastasi, 1976). Raw score distributions of the MBTI scales were also used. Webb (1964) has established that MBTI raw scores may be utilized in this fashion without any loss of information and without any reduction in the strength of the scales' correlations with other variables. EPQ-R raw scale scores were also utilized, as the EPQ-R manual provides no method for score transformation. MCMI raw scale scores were utilized because it was felt that

transformation of the raw scores to base-rate scores, a conversion of scores based upon personality and syndrome prevalence data in clinical populations, would not be appropriate and would be of questionable meaningfulness for this sample.

In regard to major hypothesis 3, three groups were selected from the total sample in order to perform SLIP profile age group comparisons. The first group consisted of all subjects 22 years old and younger ($n = 156$, mean age = 18.4). The second group was comprised of all subjects between the ages of 28 and 35, inclusive ($n = 31$, mean age = 32). The third group was comprised of all subjects 41 years old and older ($n = 33$, mean age = 47.3).

Cohen's Kappa (Cohen, 1960), an index of interjudge agreement, was utilized to test for statistical significance in the comparison of SLIP and MBTI profiles. Cohen's Kappa provides an index for agreement over and above the agreement expected by chance for independent ratings between two judges. It is thus a more meaningful procedure for indicating interjudge agreement than percentage-of-concordance procedures. In assessing classification agreement between the two measures for the individual functions,

an agreement was considered to have occurred whenever one of the two highest SLIP combined function scores also appeared in the MBTI profile.

CHAPTER IV

RESULTS

SLIP Item-Total Correlations

Major hypothesis 1 was not supported in regard to both level of item-total correlations and item-scale discrimination. Twelve items (10%) failed to correlate with one or more of their assigned scales at the test authors' minimum criterion level of .20. The basic scales exhibited the highest item-total stability: only one IT item and one IF item failed to reach the .20 level. Among the combined function scales, one T scale item, one S scale item, three F scale items, and two N scale items did not exhibit an item total correlation at or above that level. Only one E scale item, but five I scale items showed item-total correlations below .20, and the J and P scales each had four items fall below that level.

Since .20 is a rather low criterion level, the item-total correlations were also inspected to determine what percentage of the correlations failed to exhibit a level of at least .30. Again, the basic scales fared best. One IT, one IS, one ES, two IN, and three IF

scale items failed to show at least that level of association. Among the combined function scales, only one T scale item, but fully 20% of the S scale items, 23% of the N scale items, and 30% of the F scale items failed to exhibit item-total correlations of .30. Fifteen percent of the E scale items and 27% of the I scale items failed to correlate at that level. Thirty-five percent and 37% of the P and J scale items, respectively, also failed to show item-total correlations of .30. Table 2 presents the average item-total correlations and item-total correlation ranges for the SLIP's sixteen scales.

As can be seen, all average item-total correlations are rather low, the highest being .44 for the IT and EN basic scales. The lowest was .33 for the F and J scales. The correlation ranges indicate that considerable item heterogeneity exists within each scale.

Major hypothesis 1 was also not supported in that 64 items (53.3%) failed on at least one occasion to correlate most highly with their assigned scales. Fourteen items correlated more highly with one or more non-assigned basic scales. Only one Thinking item failed to correlate most highly with that combined

Table 2

Singer-Loomis Inventory of Personality Average Item-
Total Correlations^a

Scale	Mean item-total correlation	Range	Number of items
Introverted Thinking (IT)	.44	.17-.53	15
Introverted Feeling (IF)	.39	.17-.54	15
Introverted Sensation (IS)	.41	.25-.54	15
Introverted Intuition (IN)	.43	.27-.62	15
Extraverted Thinking (ET)	.43	.37-.58	15
Extraverted Feeling (EF)	.40	.30-.51	15
Extraverted Sensation (ES)	.42	.22-.61	15
Extraverted Intuition (EN)	.44	.30-.52	15
Extraversion (E)	.36	.14-.60	60
Introversion (I)	.34	.08-.48	60
Sensation (S)	.36	.14-.55	30
Intuition (I)	.38	.15-.62	30
Thinking (T)	.41	.16-.56	30
(continued)			

Table 2 (continued)

Scale	Mean item-total correlation	Range	Number of items
Feeling (F)	.33	.14-.49	30
Judging (J)	.33	.09-.48	60
Perceiving (P)	.34	.11-.56	60

^aN = 234

scale. However, eight of the thirty Feeling scale items correlated more highly with one or more of the other combined function scales. Also, eight of the thirty Intuition scale items and twelve of the thirty Sensation scale items correlated more highly with one or more of the other combined function scales. Eleven Extraversion items (18%) correlated more highly with the Introversion scale, and twelve Introversion items (20%) correlated more highly with the Extraversion scale. Thirteen Judging items (22%) and fifteen Perceiving items (25%) correlated more highly with the wrong scale of that dimension.

Satisfactory item-scale discrimination was also not exhibited even when an item did correlate most highly with its intended scales, since its correlations with one or more other theoretically incongruent scales were nearly as large in numerous instances. Appendix B contains a listing of those items which failed to correlate at the .20 and .30 levels with their assigned scales. Appendix B also contains a listing of those items which failed to correlate most highly with their assigned scales. The non-assigned scales with which they correlated most highly are indicated. A copy of the Singer-Loomis Inventory of Personality's 15

situations and 120 response items is contained in Appendix C.

SLIP Basic Scale Intercorrelations

Major hypothesis 2 was not supported. While the SLIP basic scales which share either an attitude or function did, on average, intercorrelate more highly than those basic scales which do not (average intercorrelation of .57 versus .46), the expected pattern failed to occur in 24 instances (25% of the relevant comparisons). For example, IT correlated more highly with EF, ES, and EN than with IF and IN. Table 3 shows the SLIP's basic scale intercorrelations.

The relatively high correlation between IT and ET ($r = .75$) suggests that the SLIP combined Thinking scale reflects a more unified dimension than the other combined function scales. IF and EF exhibited a correlation of .39, IS and ES a correlation of .55, and IN and EN a correlation of .59.

Bipolar Ordering of Functions across Age Groups

Major hypothesis 3 was not supported. Subjects in the older age groups did not exhibit a lesser tendency to be classified by the SLIP as having inferior cognitive modes which were the bipolar opposites of their dominant cognitive modes ($X^2(2) = 0.37$, n.s.).

Table 3

Singer-Loomis Inventory of Personality Basic Scale
Intercorrelations^{a, b}

Scale	IT	IF	IS	IN	ET	EF	ES	EN
IT								
IF	.36							
IS	.65	.53						
IN	.42	.63	.57					
ET	.75	.24	.57	.31				
EF	.50	.39	.57	.49	.57			
ES	.56	.28	.55	.37	.62	.65		
EN	.53	.50	.57	.59	.61	.66	.60	

Note. IT = Introverted Thinking; IF = Introverted Feeling; IS = Introverted Sensation; IN = Introverted Intuition; ET = Extraverted Thinking; EF = Extraverted Feeling; ES = Extraverted Sensation; EN = Extraverted Intuition.

^aN = 234

^bp < .001 in all instances

Twenty-two percent (32) of the subjects 22 years old or younger, 18% (5) of the subjects between the ages 28 and 35, and 24% (8) of the subjects 41 years old or older exhibited a bipolar ordering of the SLIP cognitive modes.

SLIP and MBTI Comparisons

Multitrait-Multimethod Correlation Matrix

Hypothesis 4 was not supported. In the SLIP and MBTI multitrait-multimethod correlation matrix (see Table 4) only two of the correlations in the validity diagonal of the heteromethod block exhibited even minimal evidence of convergent validity. Most of these validity correlations approached zero. Of the three which were appreciably different from zero, SLIP scales E and J correlated positively and significantly with their corresponding MBTI scales. SLIP scale P correlated negatively and significantly with MBTI scale P.

Evidence for satisfactory discriminant validity was also not found. In no instance was an entry in the validity diagonal of the heteromethod block the highest value in its particular row and column. Most of the heteromethod-heterotrait entries approached zero. All the SLIP scales except the F scale and the N scale

Table 4

Singer-Loomis Inventory of Personality (SLIP) and Myers-Briggs Type Indicator (MBTI)
Multitrait-Multimethod Correlation Matrix^a

	T	F	S	SLIP ^b N	E	I	J	P	T	F	S	MBTI N	E	I	J	P
SLIP																
T	()															
F	.54	()														
S	.73	.69	()													
N	.56	.77	.67	()												
E	.81	.76	.86	.78	()											
I	.72	.83	.78	.81	.72	()										
J	.90	.84	.81	.75	.90	.88	()									
P	.70	.80	.90	.93	.89	.90	.85	()								
MBTI																
T	.03	-.12	.02	.05	.04	-.04	-.04	.04	()							
F	-.09	.09	-.08	-.05	-.06	-.01	-.01	-.01	-.90**	()						
S	-.01	-.04	.08	-.01	.01	.01	-.02	.04	.34**	-.33**	()					
N	-.04	.01	-.12	-.03	-.05	-.05	-.02	.08	-.30**	.33**	-.92**	()				
E	.03	.05	.08	-.10	.16 ⁺	-.14 ⁺	.05	-.02	-.02	.04	-.17 ⁺	.16 ⁺	()			
I	-.06	-.09	-.12	.05	-.19*	.09	-.08	-.03	-.01	-.00	.15 ⁺	-.14 ⁺	-.94**	()		
J	.36**	.03	.22*	.09	.21*	.17*	.24**	.16 ⁺	.14 ⁺	-.18*	.45**	-.44**	-.12	.11	()	
P	-.38**	-.05	-.23**	-.07	-.22*	-.18*	-.26**	-.16 ⁺	-.11	.17*	-.41**	.43**	.13 ⁺	-.13 ⁺	-.96**	()

(continued)

Table 4 (continued)

Note. T = Thinking; F = Feeling; S = Sensation; N = Intuition; E = Extraversion;
I = Introversion; J = Judging; P = Perceiving.

^aN = 234

^bAll SLIP Scale Intercorrelations significant, p < .001

⁺p < .05

^{*}p < .01

^{**}p < .001

correlated positively and significantly with MBTI J, and negatively and significantly with MBTI P.

Worthy of some note is the fact that the SLIP's E scale correlated negatively and significantly with the MBTI I scale, and that the SLIP's I scale correlated negatively and significantly with the MBTI's E scale. However, these relationships were very weak.

It is also worth noting that the relatively higher intercorrelations among the instruments' scales in the monomethod blocks, especially among the SLIP's scales, indicate the dominance of method factors in the instruments' score variance.

Classification Comparisons

Table 5 presents the frequencies with which the SLIP and MBTI classified the introductory psychology course undergraduates 24 years old or younger and the subjects from older age groups in the individual and basic type categories.

Slightly more than 87% of the total sample was classified as introverted by the SLIP, whereas the MBTI classified only 50% of the total sample as introverted. The SLIP classified the older subjects considerably less often as N types in comparison to the introductory psychology course undergraduates (30% to 51%). The SLIP

Table 5

Singer-Loomis Inventory of Personality (SLIP) and Myers-Briggs Type Indicator (MBTI)
Classification Frequencies^{a,b}

Dimension	Younger ^c	SLIP Older	Total(%)	Younger	MBTI Older	Total(%)
E	20	7	27 (11.5)	80	37	117 (50.0)
I	137	67	204 (87.2)	80	37	117 (50.0)
S ^d	57	23	80 (34.2)	96	21	117 (50.0)
N ^d	81	22	103 (44.0)	64	53	117 (50.0)
T ^d	79	57	136 (58.1)	78	22	100 (42.7)
F ^d	86	40	126 (53.8)	82	52	134 (57.3)
J	87	64	151 (64.5)	76	36	112 (47.9)
P	71	9	80 (34.2)	84	38	122 (52.1)
IT (I-TP) ^e	33	24	57 (24.4)	11	6	17 (7.3)
IF (I-FP)	24	14	38 (16.2)	20	14	34 (14.5)
IS (IS-J)	28	13	41 (17.5)	40	7	47 (20.1)
IN (IN-J)	37	7	44 (18.8)	9	10	19 (8.1)
ET (E-TJ)	5	4	9 (3.8)	13	7	20 (8.5)
EF (E-FJ)	11	2	13 (5.6)	14	12	26 (11.1)
ES (ES-P)	1	1	2 (0.8)	23	3	26 (11.1)
EN (EN-P)	4	0	4 (1.7)	30	15	45 (19.2)

(continued)

Table 5 (continued)

Note. E = Extraversion; I = Introversion; S = Sensation; N = Intuition; T = Thinking; F = Feeling; J = Judging; P = Perceiving; IT (I-TP) = Introverted Thinking dominant; IF (I-FP) = Introverted Feeling dominant; IS (IS-J) = Introverted Sensation dominant; IN (IN-J) = Introverted Intuition dominant; ET (E-TJ) = Extraverted Thinking dominant; EF (E-FJ) = Extraverted Feeling dominant; ES (ES-P) = Extraverted Sensation dominant; EN (EN-P) = Extraverted Intuition dominant.

^aN = 234

^bFor SLIP E, I, J, P, and Basic Type classifications all ties were omitted.

^c"Younger" designates those introductory psychology course subjects 24 years old and younger. "Older" designates all remaining subjects from all recruitment sources.

^dClassification for this dimension was based upon whether this dimension appeared as one of the top two function scores.

^eLetters in parentheses represent the equivalent MBTI Basic Type profile.

also classified the older subjects considerably more often as T types (77% to 49%), more often as J types (86% to 54%), and less often as P types (12% to 45%). (Chi squares could not be computed because for the function classifications subjects belonged to more than one category.)

The MBTI produced rather contradictory group differences. It classified the older subjects proportionately more often as F types and less often as T types ($\chi^2(1) = 7.5, p < .01$). Also, the MBTI classified the older subjects more often as N types and less often as S types ($\chi^2(1) = 16.8, p < .001$).

In regard to the degree of classification agreement between the SLIP and MBTI, their level of agreement on the classification of E and I was significant ($\kappa = .13, p < .05$), but not very substantial. Their degree of agreement on the classification of T was also significant ($\kappa = .10, p < .05$), but again, not much more meaningful than chance (i.e., this level of agreement suggests that only about one percent of those agreements between the SLIP and MBTI on the classification of who is or who is not a thinking type can be attributed to non-chance factors). Classification agreement on F was significant and more

substantial ($K = .24$, $p < .001$).

Classification agreement on S was also modest and significant ($K = .12$, $p < .05$). Classification agreements for N ($K = -.05$), J - P ($K = .09$), and basic type ($K = .01$) were not significant. Appendix D contains the tables which display these comparisons.

An additional analysis, comparing type classification with preferred academic subject, was performed for both the SLIP and MBTI. The MBTI (Form G) asks respondents to indicate their favorite subject from among mathematics, history, science, practical skills, art, English, and music. On the basis of theoretical type descriptions (Singer & Loomis, 1984) and previous research comparing complete MBTI type profiles to preferred academic subject (Myers, 1962), it was hypothesized that thinking types would more frequently report preferences for science and mathematics than feeling types, and that feeling types would more frequently report preferences for art, music, and English. Singer and Loomis (1984) describe thinking types as being concerned with cause-and-effect relationships, logical analysis, and theoretical issues. If also extraverted, thinking types may involve themselves in objective scientific research.

Introverted thinking is described as "the realm of philosophy, mathematics, inferential statistics, and crossword puzzles" (Singer & Loomis, 1984, p. 14).

Feeling types are described as being more concerned with personal subjective values, personal expression, harmonious interpersonal relationships, and more abstract, spiritual issues.

It was also hypothesized that sensation types would more frequently report preferences for practical skills and history than intuitive types, and that intuitive types would more frequently report preferences for art, music, and English. Singer and Loomis describe sensation types as individuals who have good memory for detail, are realistic, and are factually oriented. They often value technical skill, and often place importance on the quality of their environment. Intuitive types are described as dreamers and visionaries and are often seen as creative and spontaneous.

These hypotheses were supported by the MBTI comparisons, but not by the SLIP comparisons. Table 6 presents the comparison between T and F types for both the SLIP and the MBTI.

Subjects classified as T or F by the SLIP (those subjects who were classified as both T and F were

Table 6

Comparison of Preferred Academic Subjects for Thinking and Feeling Types on the Singer-Loomis Inventory of Personality and Myers-Briggs Type Indicator

Instrument	Classification	Science Math	Art Music English	n (%)
Singer- Loomis Inventory of Personality ^a	T	25	16	41 (47.7)
	F	25	20	45 (52.3)
	<u>n</u>	50	36	86
$\chi^2 (1) = .26, \text{ n.s.}, \text{ one-tailed}$				

Myers- Briggs Type Indicator	T	39	17	56 (44.1)
	F	32	39	71 (55.9)
	<u>n</u>	71	56	127
$\chi^2 (1) = 7.67, p < .01, \text{ one-tailed}$				

Note. T = Thinking; F = Feeling.

^aSubjects selected only if T or F (not both) was one of the top two combined functions.

omitted) did not significantly differ on the frequency of reported preference for science and mathematics as opposed to art, music, and English. Subjects classified as T or F by the MBTI did exhibit the expected significant differences in academic subject preference ($\chi^2 (1) = 7.67, p < .01$, one-tailed).

Table 7 presents the comparisons between S and N types for both the SLIP and MBTI. (Again, those subjects who were classified as both S and N by the SLIP were omitted for that comparison.)

Subjects classified as S or N by the SLIP exhibited a tendency to differ on the frequency of their reported preferences for practical skills and history versus art, English, and music in the expected direction, but this association between SLIP S versus N types and subject preference failed to reach significance ($\chi^2 (1) = 2.14, p < .10$, one-tailed).

Subjects classified as S or N by the MBTI did exhibit the expected significant differences in academic subject preference ($\chi^2 (1) = 14.20, p < .001$, one-tailed).

SLIP and MBTI Correlations with the MCMI

Major hypothesis 5 was not supported. Table 8 presents the SLIP's and MBTI's scale intercorrelations with the MCMI.

Table 7

Comparison of Preferred Academic Subjects for Sensation and Intuitive Types on the Singer-Loomis Inventory of Personality and Myers-Briggs Type Indicator

Instrument	Classification	History Practical Skills	Art Music English	n (%)
Singer- Loomis Inventory of Personality ^a	S	14	11	25 (38.5)
	N	15	25	40 (61.5)
	<u>n</u>	29	36	65
	χ^2 (1) = 2.14, <u>p</u> < .10, one-tailed			

Myers- Briggs Type Indicator	S	32	16	48 (45.7)
	N	17	40	57 (54.3)
	<u>n</u>	49	56	105
	χ^2 (1) = 14.2, <u>p</u> < .001, one-tailed			

Note. S = Sensation; N = Intuition.

^aSubjects selected only if S or N (not both) was one of the top two combined functions.

Table 8

Singer-Loomis Inventory of Personality (SLIP) and Myers-Briggs Type Indicator (MBTI)
Correlations with the Millon Clinical Multiaxial Inventory (MCMI)^a

	MCMI Scale							Passive- Aggressive
	Schizoid	Avoidant	Dependent	Histrionic	Narcissistic	Antisocial	Compulsive	
SLIP T	-.10	-.07	.07	-.02	.09	.02	.21**	-.11
MBTI T	.18**	.03	-.24**	-.07	.20**	.44**	-.10	.03
SLIP F	.04	.18**	.32***	.15*	.01	-.05	-.21**	.30***
MBTI F	-.11	.03	.23***	.06	-.18**	-.40***	.06	.01
SLIP S	-.02	.03	.15*	.08	.12	.11	-.01	.09
MBTI S	.30***	.14*	.11	-.42***	-.22**	.11	.14*	-.04
SLIP N	.18**	.29***	.36***	.06	-.02	-.01	-.24***	.35**
MBTI N	-.25***	-.15*	-.12	.40***	.20**	-.11	-.13*	.04
SLIP E	-.06	.05	.22**	.16*	.14*	.06	-.04	.13*
MBTI E	-.48*	-.37**	.64***	.49***	.22**	-.16*	.00	.00
SLIP I	.12	.18**	.26***	-.03	-.03	-.02	-.08	.20**
MBTI I	.43***	.32***	.15*	-.63***	-.47***	-.22**	.22**	-.07
SLIP J	-.04	.04	.21**	.06	.07	-.01	.03	.08
MBTI J	.13*	.07	.08	-.39***	-.16*	-.03	.40***	-.18**

(continued)

Table 8 (continued)

	<u>MCM I Scale</u>							Passive- Aggressive
	Schizoid	Avoidant	Dependent	Histrionic	Narcissistic	Antisocial	Compulsive	
SLIP P	.09	.18**	.29***	.07	.05	.05	-.15*	.25**
MBTI P	-.10	-.05	-.10	.38***	.16*	.06	-.42***	.22**

Note. T = Thinking; F = Feeling; S = Sensation; N = Intuition; E = Extraversion;
I = Introversion; J = Judging; P = Perceiving.

^aN = 234 *p < .05 **p < .01 ***p < .001

The corresponding SLIP and MBTI scales correlated in the same direction with the MCMI variables only 50% of the time (32 of the 64 pairs of correlations), and correlated significantly and in the same direction with the same MCMI variable on only eight occasions. While many of these "agreements" seemed theoretically congruent and modestly supportive of the construct validity of the SLIP and MBTI (for example, SLIP E and MBTI E correlated significantly and positively with MCMI Histrionic-Gregarious; SLIP I and MBTI I correlated positively and significantly with MCMI Avoidant), the many instances in which their arrays of correlations exhibited incongruities indicate that the two instruments' scales do not measure highly similar dimensions.

Most of the SLIP's scale relationships to the MCMI variables were quite weak. Moreover, except for the SLIP's T scale, all the SLIP scales correlated most positively with MCMI Dependent-Submissive and correlated least or most negatively with MCMI Compulsive-Conforming or MCMI Schizoid-Asocial. The SLIP's T scale correlated most positively with MCMI Compulsive-Conforming and most negatively with MCMI Passive-Aggressive (Negativistic).

MBTI T correlated most positively with MCMI .

Antisocial-Aggressive and MBTI F correlated most positively with MCMI Dependent-Submissive. MBTI S and I correlated most positively with MBTI Schizoid-Asocial. MBTI N, E, and P correlated most positively with MCMI Histrionic-Gregarious. MBTI J correlated most positively with MCMI Compulsive-Conforming.

SLIP and EPQ-R Comparisons

Major hypothesis 6 was partially supported. In the SLIP and EPQ-R correlation matrix (Table 9) SLIP scale E and EPQ-R scale E exhibited modest evidence of convergent and discriminant validity. While the correlation was rather low ($r = .29$), neither scale correlated more highly with other scales. However, SLIP I exhibited a near zero correlation with EPQ-R E and showed a much stronger relationship with EPQ-R N.

SLIP scales F, N, and P correlated positively and significantly with EPQ-R N. SLIP scales T, S, and J correlated negatively with EPQ-R P.

Steele and Kelly (1976) have previously shown the MBTI E-I continuous scale scores to correlate highly with the original EPQ E scale in a sample of undergraduate students. In order to compare the relative strength of association between the SLIP and MBTI E and I scales and the EPQ-R E scale for this sample, a standard multiple correlation was performed

Table 9

Singer-Loomis Inventory of Personality (SLIP) and
Eysenck Personality Questionnaire-Revised (EPQ-R)
Correlation Matrix

SLIP	<u>EPQ-R</u>			
	E	N	P	L
T	.09	-.05	-.36***	.22**
F	.23***	.28***	-.07	.02
S	.18**	.07	-.19**	.14*
N	.12	.40***	-.05	-.08
E	.29***	.10	-.18	.05
I	.03	.28***	-.19**	.11
J	.17**	.11	-.26***	.15*
P	.16*	.27***	-.12	.02

Note. For SLIP scales: T = Thinking; F = Feeling; S = Sensation; N = Intuition; E = Extraversion; I = Introversion; J = Judging; and P = Perceiving. For EPQ-R scales: E = Extraversion-Introversion; N = Neuroticism; P = Psychoticism, and L = Lie.

^aN = 234 *p < .05 **p < .01 ***p < .001

between EPQ-R E as the dependent variable and SLIP I, SLIP E, MBTI I and MBTI E as the independent variables. Table 10 displays the correlations between the variables, the unstandardized regression coefficients (B) and intercept, the standardized regression coefficients (Beta), the semipartial correlations (sr^2), and \underline{R} , \underline{R}^2 , and adjusted \underline{R}^2 . \underline{R} for regression was significantly different from zero ($F(4,299) = 88.92$, $p < .0001$).

Three of the four "independent variables" were significantly associated with EPQ-R E: SLIP E ($\text{sr}^2 = .01$, $p < .05$); MBTI I ($\text{sr}^2 = .02$, $p < .01$); and MBTI E ($\text{sr}^2 = .01$, $p < .01$). In combination these three variables contributed another .57 in shared variability. Altogether, 61% (60% adjusted) of the variability in EPQ-R E could be predicted by SLIP E, MBTI E, and MBTI I. SLIP I did not contribute significantly to the multiple correlation.

Finally, an effort was made to better understand what factors may have contributed to the fact that, in a considerable number of cases, the SLIP classified individuals as introverted who were classified as extraverted by the MBTI and who obtained high scores on the EPQ-R's E scale. The possibility that the SLIP's

Table 10

Standard Multiple Correlation of Singer-Loomis Inventory of Personality Extraversion and Introversion (SLIP E and SLIP I) and Myers-Briggs Type Indicator Extraversion and Introversion (MBTI E and MBTI I) on Eysenck Personality Questionnaire-Revised Extraversion (EPQ-R E)

Variables	EPQ-R E (DV)	SLIP E	SLIP I	MBTI E	MBTI I	B	Beta	sr^2 (unique)
SLIP E	.29					.03*	.16	.01
SLIP I	.03	.72				-8.97-04	.004	.00
MBTI E	.75	.16	-.14			.26**	.35	.01
MBTI I	-.76	-.19	.09	-.94		-.29**	-.40	.02
Means	15.73	172.02	193.37	13.76	12.69			
Standard Deviations	4.57	24.16	22.97	6.14	6.30			

^aUnique variability = .04;
Shared variability = .57

* $p < .05$ ** $p < .001$

Intercept = 10.68
 $R^2 = .61^a$
Adjusted $\bar{R}^2 = .60$
 $\bar{R} = .78^{**}$

Introversion items may be more "socially desirable" responses was considered. In order to explore this possibility, two groups of subjects were compared for their means on the EPQ-R L scale, which reflects a tendency to dissimulate and/or social naivete. Group 1 ($n = 20$) was comprised of those subjects who obtained a classification of E on the SLIP and MBTI, and who scored above the mean on the EPQ-R E scale. Group 2 ($n = 87$) consisted of those subjects who obtained an E classification on the MBTI and who scored above the mean on EPQ-R E, but were classified as introverted by the SLIP. It was reasoned that if the SLIP Introversion items have a more socially desirable stimulus value, a number of "true" extraverts (i.e., those who may have a higher need to "look good") may have been responsive to that aspect of those items and thus obtained a SLIP classification of I. Thus, it was hypothesized that subjects in Group 2 would exhibit higher EPQ-R L scores. This hypothesis was not supported. The two group means did not significantly differ on EPQ-R L ($t(105) = .58$, n.s.).

CHAPTER V

DISCUSSION

It was the purpose of this study to provide more information about the construct validity of the Singer-Loomis Inventory of Personality (SLIP). Only a very small number of studies to date have directly or indirectly addressed the question of the SLIP's construct validity. The nature of most of the previous studies (all conducted with earlier versions of the instrument) has chiefly been criterion-oriented. Whether through comparisons of type profiles and artistic style, or comparisons of the congruence between self-descriptions and type profile, the results have been encouraging and generally supportive of the SLIP's construct validity.

However, the results of the authors' factorial studies of the SLIP have appeared less encouraging. The four factors they report to have identified as supportive of the instrument's construct validity accounted for very small percentages of the instrument's total score variance. Moreover, on the basis of the authors' labels for the factors and their examples of

the item loadings it is not at all clear that these identified factors truly reflect the underlying functional dimensions described by Jung. Particularly noteworthy was the fact that no factors appear to have emerged which reflected the attitude dimensions.

This study approached the problem of investigating the SLIP's construct validity primarily by examining its relationships to other measures of both similar and conceptually distinct constructs which have received fairly substantial empirical support for their construct validity. Secondly, an examination of some aspects of the third version of the SLIP's internal structure was performed. These procedures are perhaps not the ideal means by which to investigate a test's construct validity, in that the instrument's scales were not directly compared to observables. However, in the absence of external criteria that are considered to be entirely adequate to operationally define Jung's constructs, they are procedures which can expand the body of evidence relevant to what constructs the SLIP's scales appear to be measuring (Cronbach, 1955; Campbell & Fiske, 1959). Moreover, the specific comparisons of the SLIP with the MBTI provide practical implications for consumers who have questioned how these two

instruments of Jungian type compare.

This discussion section is organized in six parts. The first addresses the results pertaining to this study's major hypothesis concerning the SLIP and MBTI comparisons. The second addresses the results pertaining to the major hypothesis which concerned itself with the SLIP and EPQ-R comparisons. The third section addresses the question of which instrument, the SLIP or MBTI, appears to "perform better" in relation to the modest external criteria available for comparison in this study. The fourth section addresses the results pertaining to this study's major hypothesis regarding the bipolar ordering of functions for different age groups. The fifth section contains a discussion of the results relevant to this study's major hypotheses about the current version of the SLIP's internal structure, and the sixth section is a summary of findings, including a discussion of methodological issues and suggestions for further research with the SLIP.

SLIP and MBTI Comparisons

The major hypothesis in this study concerning the interface between the SLIP and MBTI was not supported. Neither through direct comparison of the instruments via a multitrait-multimethod correlation matrix, nor through

an examination of their respective arrays of correlations with the MCMI variables, was satisfactory evidence of convergent and discriminant validity obtained for any scale. In the SLIP and MBTI correlation matrix the only scales which even minimally exhibited favorable convergent validity were the SLIP and MBTI E and J scales. The degree of congruence observed in the arrays of correlations with the MCMI variables did not appear to appreciably differ from what might be expected from chance.

Campbell and Fiske (1959) delineate a number of propositions an investigator should entertain when this situation is encountered: 1) Neither method is adequate for measuring the traits; 2) one of the two methods does not really measure the traits (and perhaps measures some other constructs); 3) the traits are not functional unities such that the response tendencies involved are specific to non-trait attributes of each test; and 4) irrelevant method variance and/or response sets are occurring in one or both tests to such an extent that evidence of validity is not obtained. In the examination of the SLIP and MBTI correlation matrix and their arrays of correlations with the MCMI it appears that proposition (4), and perhaps (2), may best explain

the obtained findings. (Alternative proposition 1 is not supported by the fact that the MBTI scales have received generally favorable empirical support.

Alternative proposition 3, while possible, is not readily apparent in the available data and beyond the scope of this study to support or refute.)

The very high intercorrelations among the combined SLIP scales in Table 4 not only indicated low discrimination among the scales, but also that method factors played a predominant role in total score variance. In addition to this, it was interesting to note that six of the eight combined SLIP scales (T, S, E, I, J, and P) correlated most positively and significantly with the J-P dimension of the MBTI, and that SLIP scales F and N did not exhibit meaningful correlations with any of the MBTI scales. If some construct validity of the MBTI J-P scales is accepted, this finding suggests that individuals who score more highly on those six SLIP scales tend to have a behavioral style characterized by a concern for organization, purposefulness, decisiveness, and a need for closure (Myers & McCaulley, 1985).

Considered in light of the SLIP response format this would also suggest that those who are more decisive

and in greater need of closure (and perhaps more "set" in their self perceptions) are more likely to give ratings of "almost always" or "always" to more of the SLIP's response alternatives. Correspondingly, those who exhibit less decisiveness and need for closure (and who perhaps may have more fluid self perceptions) may be more open to seeing themselves performing any of the SLIP responses and thus less likely to respond "always" or "almost always". Thus, at least in regard to those six SLIP scales, it can be argued that the pattern of correlations obtained between the SLIP and MBTI does little more than reflect a response bias phenomenon akin to "degree of tentativeness" in regard to what respondents are willing to report about behavior. SLIP F and N's failure to exhibit this pattern is difficult to explain. It may be that those scales' items are less subject to this particular bias (or do not assess this particular "trait").

It was also interesting to observe that all SLIP combined scales except scale T exhibited their highest positive significant correlations with MCMI Dependent-Submissive, and their most negative correlations with either MCMI Compulsive-Conforming or Schizoid-Asocial. This pattern of correlations did not appear to be

artifactual in that all the MCMI variables had approximately equal variances.

Millon (1983) reports that individuals scoring high on Dependent-Submissive exhibit docile and noncompetitive temperaments, interpersonal submissiveness, low self confidence, naive and/or global cognitive styles, and avoidance of self assertion. Individuals scoring high on Compulsive-Conforming exhibit restrained affectivity, a disciplined and conscientious self-image, interpersonal respectfulness, cognitive constriction characterized by indecisiveness and rule-bound thought, and behavioral rigidity. High scorers on Schizoid-Asocial reflect tendencies toward interpersonal indifference, behavioral apathy, poor awareness of self and others, disruptions in cognition, and affective blandness.

With Millon's scale descriptions in mind, one possible interpretation of this pattern of correlations between the SLIP and MCMI is again one of a particular response bias. Examining this pattern of correlations in terms of the cognitive style associated with each of the above MCMI variables, it appears that individuals who score highly on almost any SLIP scale (more likely to respond "always") are also more likely to exhibit

global or perhaps naive cognitive styles, and low scorers more likely to exhibit indecisive, restrained, or apathetic cognitive styles. SLIP F and N scales appeared to be most strongly subject to this phenomenon.

That SLIP scale T did not exhibit this pattern, showing only a single positive significant correlation with MCMI Compulsive-Conforming, was interesting. As was seen in the basic scale intercorrelations, scale T appears to reflect a more unitary dimension than the other combined function scales. One possible interpretation of this finding, then, is that fairly strong common trait variance between SLIP T and MCMI Compulsive-Conforming (appreciation of logic, rules, and orderliness) "overcame" response bias in this instance, providing supportive evidence for the construct validity of SLIP T.

In summary, satisfactory validity estimates between the MBTI and SLIP were not obtained, with confounding method variance and response biases in the SLIP overwhelmingly apparent. On the basis of this, the two instruments certainly may not be said to be interchangeable. Lack of congruence was also seen in the findings that the two instruments appreciably agreed by little or no more than chance on their

classifications of seven of the eight individual attitude and function dimensions, and of basic type profiles.

Admittedly, the SLIP was not constructed to be "interchangeable" with the MBTI, especially with respect to the classification of the functions. However, their very low level of agreement on the I and E dimensions is particularly striking, since introversion-extraversion is considered to be such a fundamental personality dimension. The method factor which perhaps most contributed to the lack of congruence observed between the two instruments is the SLIP's rather complicated situational format. By placing its response alternatives in the context of situations designed to elicit "emotional sets" (Singer & Loomis, 1984), the SLIP, in effect, is an instrument which assesses situation-specific response tendencies rather than the more general traits which the MBTI attempts to assess. Thus, the additional "noise in the system" contributed by the SLIP may largely account for the striking lack of common trait variance obtained for any of their respective scales.

SLIP and EPQ-R Comparisons

The major hypothesis in regard to the SLIP and

EPQ-R comparisons, that the I-E dimensions of the two instruments measure highly similar constructs, was only partially supported. EPQ-R E exhibited its largest positive and significant (though still modest) correlation with SLIP E. However, no correlation was obtained between SLIP I and EPQ-R E, and SLIP I exhibited a significant positive correlation with EPQ-R N.

Since Loo (1979) and Rocklin and Revelle (1981) have provided rather convincing evidence that EPQ-R E is a unidimensional scale of sociability, these findings can be interpreted as modest support for the construct validity of the SLIP E scale. Singer and Loomis (1984) describe extraverts as tending to have many friends, and as individuals whose essential decisions and actions are determined by their relationships to other people.

The pattern of correlations obtained between SLIP I and EPQ-R variables, especially the lack of negative association between SLIP I and EPQ-R E, is not supportive of that scale's construct validity. In as much that Jungian theory holds that the attitude of introversion is characterized by "a negative relation to the object" (Jung, 1933, p. 98), that introverts are more attuned to and concerned with the subject and the

development of self knowledge than to their subjective surroundings (Singer, 1972), and that introverts may mistrust other people and expect the worst of them (Whitmont, 1969), it would be expected that SLIP I would exhibit a negative association to EPQ-R E. For SLIP I to exhibit no such relationship to EPQ-R E would suggest that its scores should not be interpreted readily in terms of the commonly understood sociability aspect of introversion, and that more evidence is needed to shed light on what aspects of the construct it may reflect.

SLIP I's modest positive association with EPQ-R N, which suggests that high scorers on SLIP I tend to report a greater tendency to worry and to exhibit negative emotionality, is not supportive of the Jungian construct of introversion per se. Jung (1921/1971) argued that introversion is an equally valid psychological adaptation to the world as extraversion, not to be equated with pathological constructs or constitutional weakness. However, he and other Jungian theorists (Singer, 1972; Whitmont, 1969) agree that introverts, especially in their younger years, often have difficulties "fitting in" and being comfortable in the context of the extraverted demands of our western culture. Thus, to the extent that the finding of a weak

relationship between SLIP I and EPQ-R N may reflect introverts' relative unhappiness in this sample, the finding is not considered surprising or unexpected.

Modest levels of support for a number of the other SLIP scales' construct validity was also seen in the SLIP and EPQ-R correlation matrix. For example, SLIP T correlated negatively and significantly ($r(232) = -.36$, $p < .001$) with EPQ-R P.

EPQ-R P reflects a personality dimension characterized by poor socialization, disregard for convention and rules, or disinhibited behaviors. Thus, this finding is somewhat supportive of the construct validity of SLIP T.

Also, SLIP N correlated positively and significantly with EPQ-R N ($r(232) = .40$, $p < .001$). This can be interpreted as indicating that those who tend to have intuition as a highly developed function (i.e., are attuned to perceiving possibilities) tend to report more tendencies to worry. To the extent that worry and fearfulness involve attending to possibilities, this correlation provides some support for SLIP N's construct validity. However, intuition is conceptualized as being independent of affective style or of a dimension of stability-instability, and in this

regard the constructs intuition and EPQ-R N do not theoretically overlap. Further investigation may be needed to determine whether SLIP N is measuring negative affective states to an inappropriate degree.

SLIP F's low positive significant correlation with EPQ-R E ($r(232) = .23, p < .001$) is theoretically congruent in that individuals who have feeling as a relatively highly developed function place importance on human values and experience, and, when these individuals are also extraverted, are highly socially engaged. "It is through the characteristics of the feeling function that human beings are connected and human relationships established" (Singer & Loomis, 1984). SLIP F's low significant positive correlation with EPQ-R N, accounting for only 8% of the variance, can be seen also as modestly supportive of SLIP F's construct validity in that feeling types are expected to let their emotional reactions be more visible (Keirsey & Bates, 1984).

In summary, limited support for the construct validity of SLIP scales E, T, N, and F was observed in the SLIP and EPQ-R correlation matrix, and it must be noted that for SLIP E and EPQ-R E the strength of the obtained relationship was quite low. Furthermore, the role that response bias factors played in the obtained

findings, while not clearly evident, may have accounted for at least some of the observed relationships. SLIP I did not exhibit satisfactory convergent-discriminant validity, and its relationship with the EPQ-R variables suggested that it may not strongly reflect its construct's aspect of low sociability.

SLIP and MBTI Comparisons to External Criteria

This study provided three avenues by which the SLIP and MBTI could be compared against external criteria: 1) Classification distributions for the sample; 2) academic subject preference; and 3) their pattern of relationships to constructs from other measures. These investigations were indirect and modest in scope, and no major hypotheses were offered in regard to which instrument would "perform best".

The first avenue by which this issue could be explored was that of comparing how the two instruments classified this sample, based on what might be expected. Unfortunately, there are no available true population values as external criteria against which to compare the obtained distributions. All the available population estimates derived from empirical studies have been obtained through studies using the MBTI, which of course can not be used as independent external criteria.

However, it does appear to be a widely held belief that extraversion is the predominant attitude held by individuals in our culture (Jung, 1921/1971; Keirsey & Bates, 1984; Myers & McCaulley, 1986; Singer, 1972; Whitmont, 1969), and that more people in this culture tend to be sensation types than intuitive types. These assumptions are held by Jungian theorists as well as by individuals who have derived their estimates through research with the MBTI. This general agreement from both "camps" on the expected population distribution for these types can thus serve as a very imperfect, theoretical, criterion against which to compare the distributions obtained from the two instruments. Also, there appears to be a general consensus that there is an overall balance between thinking and feeling types in the population, with men more often being thinking types, and women more often being feeling types (Keirsey & Bates, 1984; McCaulley, Macdaid, & Kainz, 1985; Singer, 1973).

In regard to this particular sample, it can perhaps be expected that there would be a greater number of introverts, intuitive types, and feeling types among the older subjects since all of these subjects volunteered out of an interest to learn more about their

personality style (indicating a psychological mindedness theoretically associated with I, N, and F), and because a large proportion of these subjects were in human service fields and/or in the practice or study of pastoral counseling-interests traditionally associated with the N and F types (Keirsey & Bates, 1984).

Given these arguments, it would appear that the MBTI classifications for the sample were much more in line with the expected. The MBTI classified the introductory psychology course undergraduates as equally distributed between extraverts and introverts, with sensation types outnumbering intuitive types, and with thinking and feeling types approximately equal. The older subjects were indeed classified proportionately more often as intuitive and feeling types, but were also equally divided on the extraversion-introversion classifications.

The SLIP, on the other hand, classified both the introductory psychology course undergraduate and the older subjects as very predominately introverted, and classified the older subjects more often as thinking types and least often as intuitive types. These findings do not fit well with what would theoretically seem to be expected in this overall sample, especially

the SLIP's classification of nearly 90% of the overall sample as introverted.

Another avenue through which the MBTI and SLIP could be compared was in the relationships between type classification and reported academic subject preference. The exploratory hypotheses in regard to this were: 1) Thinking types would more frequently report a preference for science and mathematics, and would less frequently report a preference for art, English, or music, than feeling types; and 2) sensation types, in comparison to intuitive types, would more frequently report a preference for practical skills or history, and would less frequently report a preference for art, English, or music.

These hypotheses were supported by the MBTI comparisons and not by the SLIP comparisons, bringing some question to the discriminative ability of those SLIP scales.

The third avenue for comparison of the two instruments against external criteria was through the examination of their corresponding scale relationships to scales of similar and distinct constructs from other tests. MBTI I and E correlated much more robustly with the E scale of the EPQ-R than SLIP E, and SLIP I failed

to contribute significantly to the multiple correlation, making it clear that SLIP I and MBTI I do not assess similar dimensions, and that MBTI I is strongly associated with the sociability aspect of introversion.

In regard to the SLIP and MBTI's respective contrasts to the MCMI variables, the meaningfulness of the comparison was vitiated by the fact that response bias appeared to play such a major role in the SLIP and MCMI correlations and that, overall, very few robust SLIP correlations emerged. In general, the MBTI scales exhibited many more theoretically congruent and meaningful correlations. For example, MBTI scale E exhibited strong, theoretically congruent associations with MCMI Histrionic-Gregarious and Narcissistic. MBTI scale I was substantially associated with the MCMI Schizoid-Asocial and Avoidant, as might be expected.

On the other hand, SLIP E exhibited weak positive significant correlations with MCMI Histrionic-Gregarious and Narcissistic, but correlated most highly with MCMI Dependent-Submissive, which is not theoretically congruent.

In one exception to this overall pattern, SLIP scale T appeared to relate in a somewhat more theoretically congruent manner with the MCMI variables

than MBTI scale T. SLIP T's only positive significant correlation was with MCMI's Compulsive-Conforming, which reflects a tendency to value order, rules, and organized, meticulous work (Millon, 1983) - characteristics often theoretically associated with thinking types (Singer & Loomis, 1984). MBTI T did not correlate significantly with that scale, but correlated most highly with MCMI Antisocial-Aggressive. Since MBTI F correlated most strongly and negatively with MCMI Antisocial-Aggressive, MBTI T and F in this instance seemed to act as a bipolar dimension akin to degree of need for dominance or interpersonal connectedness, rather than a dimension reflecting the tendencies to make judgements by human subjective values or by logical analysis. This pattern of results indicate that SLIP and MBTI T perhaps measure important, but relatively independent components of the same construct.

In summary, the picture that emerged from this study's attempts to compare the scales of the SLIP and MBTI against external criteria was one much more favorable to the MBTI. Whether in terms of classification distributions, academic subject preference, or comparisons with other constructs, the MBTI scales generally performed in a more theoretically

congruent manner and exhibited much higher levels of association in other constructs.

A fairly strong and troubling bias toward classifying individuals as introverted was seen in the SLIP. It seemed very unlikely that such a high percentage of the sample was actually introverted. An attempt to explain this in terms of a social desirability bias toward SLIP introversion items was not successful. This bias remains difficult to explain. It may be that SLIP I items are too general in content to adequately tap the construct, such that they are responded to by most respondents regardless of "true type".

Bipolar Ordering of Functions across Age Groups

The major hypothesis of this study regarding the bipolar ordering of SLIP cognitive modes across age groups was not supported. A number of alternative explanations for this finding can be offered: 1) It is not true that with increasing psychological maturity individuals exhibit a reduced tendency to have an inferior cognitive mode which is the bipolar opposite of their dominant cognitive mode; 2) age is too crude an index of psychological maturity for this developmental trend, if true, to exhibit itself through the comparison

of age groups; 3) the SLIP is not an adequate instrument with which to assess whether this developmental process is true or not; 4) the sample sizes for the two groups of older subjects in this study were too small for this process to be detected; and 5) attributes specific to this sample contributed to the lack of a positive finding. One or all of explanations 1, 2, or 3 may be true, but it is not possible, within the context of the present data to determine their relative merits. Explanations 4 and 5 do not appear to be highly likely, since no trends in support of the hypothesis were seen in the smaller groups, and there is no reason to believe that this sample of undergraduates was particularly psychologically mature or that the older subjects were particularly immature.

The only available information against which to compare these findings are Singer and Loomis' (1984) estimation that the bipolarity assumption may hold true for as much as 75% of the population, and Hurley and Cosgro's (1986) finding that the majority (percentage unspecified) of their undergraduate sample exhibited a bipolar ordering of cognitive modes. The findings of this study do not corroborate these previous estimates and reports, since only 22% of this study's

undergraduate sample, 18% of the 28 - 35 year-olds, and 24% of the subjects 41 years of age or older exhibited a bipolar ordering of cognitive modes. The reasons for the differences found in this study are not clear, but do suggest that the percentage of respondents who do exhibit a bipolar ordering of SLIP cognitive modes may be highly unstable from sample to sample, and that there is little empirical evidence so far to support Singer and Loomis' arguments about the expected patternings of cognitive modes across age groups. Inasmuch as the SLIP in this instance did not exhibit results consistent with theoretically predicted developmental changes, support for its construct validity was not found.

Internal Structure of the SLIP

This study's findings in regard to the internal structure of the SLIP (item-total correlations, scale intercorrelations) indicate that despite three revisions of the instrument, considerable internal consistency problems continue to exist. Perhaps most troubling is the large number of items which, for this sample, correlated more highly with scales to which they are not assigned. This problem is especially prevalent among the SLIP's combined scales. This undoubtedly contributed to the often poor statistical discrimination

observed among the SLIP's scales, and conceptually creates confusion as to what the scales are measuring. Furthermore, inasmuch as these results indicate that the SLIP's item-scale correlations may be undesirably unstable from sample to sample, that they are on average undesirably low, and that there continues to be an inappropriate degree of item heterogeneity within each scale, future efforts to validate the SLIP's scales against external criteria will face considerable limitations in terms of interpretability and generalizability.

It should be noted that these problems are not as great for the SLIP's basic scales, and moreover, that the SLIP's highly situational format and the rather specific content of its response alternatives may serve to lower the reasonably expected levels for the item-total correlations and degree of item homogeneity, especially among the combined scales. Even so, the basic scales fail to exhibit satisfactory theoretically congruent intercorrelations. It should also be repeated that of the combined function scales, the SLIP's T scale exhibits the fewest problems with item weakness and appears to measure the most unified dimension.

Summary of Findings

The major findings of this study which were supportive of the construct validity of the SLIP were limited, but can be summarized as follows:

- 1) Scale E consistently appeared to be a modest measure of sociability and outward assertiveness;
- 2) scale T correlated with other constructs in such a way to indicate it weakly reflects a behavioral style characterized by need for order, organization, planning, and low impulsivity. Of the SLIP combined scales, it appeared to reflect the most highly unified dimension;
- 3) scale F correlated with other constructs in such a way to indicate it weakly reflects social involvement and readiness to express affect. In addition, the SLIP and MBTI exhibited a significant but modest tendency to agree on the classification of F types; and
- 4) scale N exhibited a positive association with an index of worry.

Many of these relationships were quite weak, and are burdened with interpretation difficulties because

the SLIP combined scales were shown to share a high level of common variance, which appeared due in large part to response set biases and weak item discrimination among the scales. Also, it is possible that because of the many correlations performed that a number of the significant correlations could have been due to chance factors.

The findings which appeared damaging to the construct validity of the SLIP included:

- 1) The SLIP's failure to exhibit practically any appreciable common trait variance with the MBTI scales;
- 2) nearly negligible classification agreement with the MBTI for extraversion - introversion beyond level of chance;
- 3) the failure of SLIP I to correlate with other measures of sociability;
- 4) the SLIP's apparent bias in favor of classifications of introversion, and its seemingly unlikely classification distributions for this sample;
- 5) the SLIP's failure to show theoretically predicted developmental changes;
- 6) the failure of SLIP classifications to

successfully predict academic subject preferences; and

- 7) unsatisfactory item-scale consistency and weak discrimination among scales, especially the SLIP combined scales.

What this study made clear is that, on a practical level, consumers must take note that the SLIP and MBTI are not interchangeable instruments, even on the dimensions of introversion - extraversion, and that the SLIP appears to overpredict introversion. What is more, it remains unclear as to what the classification of introversion means, since the SLIP I scale does not appear to assess the commonly understood sociability aspect of introversion.

From a test construction and research perspective, it appears that considerable improvements at the item level in the SLIP need to be made in order to improve scale discrimination, to improve item stability for the combined scales, and to reduce the bias toward introverted items, before systematic evaluations against external criteria to validate the instrument will be optimally meaningful. Furthermore, it is apparent that the response bias problem in the SLIP format perhaps necessitates limiting future validation work with the

SLIP to procedures of classification comparisons with external criteria.

It is possible that the SLIP's authors would take exception to this researcher's decision to perform correlations with the SLIP's raw scores instead of the percent scores they recommend in the manual for the basic scales. However, the authors recommend nothing about the use of percent scores for the SLIP combined scales (which were most frequently utilized in this study because they allowed for the most relevant and direct comparisons between the SLIP, MBTI, and EPQ-R), and they do not comment on the conceptual and statistical limitations involved in using percent scores. Conversion of the SLIP's basic scale scores to percent scores make the basic scale scores purely ipsative, and thus entirely interdependent. With purely ipsative scores every individual's scores sum to the same constant, and a low score on one scale is mathematically determined by a high score on another (Hicks, 1970). Hicks (1970) and Anastasi (1976) have pointed out that performing correlations with purely ipsative scores not only limits the interpretability of the obtained correlations (because of the artifactual nature of the scores' interdependency), but that it is

especially not legitimate to report intercorrelations among ipsative scales.

For the above reasons it was felt that the use of SLIP raw scores was justified. The problem remains for the authors to reduce the problem of response bias in the SLIP without resorting to full ipsatization of the scales if more meaningful correlational uses of the SLIP are desired. One procedure that might be attempted, which the authors themselves apparently have considered in the context of how to determine the relative strength of attitude and function development from the SLIP raw scores, would be to develop a system of separate norms for individuals who exhibit tendencies to report many high or many low ratings on the response alternatives.

In regard to the methods used in this study, it needs to be pointed out that the sample, in terms of representativeness, is of course less than ideal. Moreover, many of the subjects in the older age groups had either an interest in, or some prior knowledge of, Jungian typology. This could have biased their responses. For example, some of these subjects could have had preconceived notions about their type structure and could have responded in a way to attempt to influence the results of one or more of the measures.

Also, most - but not all - of the older subjects completed the questionnaires under different environmental conditions than the introductory psychology course undergraduates, which could have introduced different types of biases or response sets. While it is not clear how these factors might have systematically influenced the obtained findings, the possibility certainly exists, and it may have been more appropriate to compute the correlational analyses on the undergraduate sample only. This would also have improved the researcher's ability to state for what type of sample the obtained findings appeared to hold true.

In summary, the methods used in this study to examine the construct validity of the Singer-Loomis Inventory of Personality (SLIP) provided a demonstration of how the situation-trait format of the SLIP makes it such a unique instrument of Jungian typology that future validation procedures will most profitably be made through comparisons between SLIP type profiles and external behavioral criteria. While some limited correlational support was found for the construct validity of its E, F, N, and T combined scales, the SLIP's basic scales exhibited the fewest problems with item weakness. Thus, future research with the SLIP

should probably be restricted to basic scale profiles until item improvements are made (especially for the combined scales), and problems with response bias in all scales are more adequately addressed.

A major problem identified in this study was that, even when only using the SLIP's basic scales, the instrument appears to overpredict introverted types. The reasons for this are not entirely clear, but appear related to the fact that, content - wise, the instrument's introverted items lack sufficient specificity to tap aspects of introversion other than low sociability, which this study showed is not associated with the SLIP's Introversion scale.

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APPENDIX A

CONSENT FORM

Dear Friend,

Thank you for volunteering to participate in my research project. My project has to do with determining the best way to measure certain aspects of our personalities. There are no right or wrong answers to the questions in the questionnaires you will be completing today, and it is not the purpose of this study to measure intelligence or to determine whether or not a person has emotional problems. For these reasons, it is very important that you answer the enclosed questionnaires according to what you really know to be true of yourself and not according to how you think you should respond.

Please know that all of the information that we collect today is confidential. This means that it will be seen only by myself and other qualified researchers and will be used for research purposes only. Further, the information is anonymous. Your name will not appear on any of the data. (Please, do not put your name on any of the questionnaires or answer sheets!) Instead, we are coding all of the information by number, not name. Finally, should you decide at any point to discontinue your participation in my project, for whatever reason, please feel free to do so. Though we do not expect that this will happen, we want you to know that you are free to leave the study at any point without incurring any kind of penalty.

Please feel free to ask any questions. Once again, thank you for participating in my project.

Sincerely,

Greg Gilliam

I have read the above and understand it.

Name

Date

DEBRIEFING STATEMENT

Dear Friend,

Thank you very much for coming today and participating in my research project. The general area of psychology to which my study belongs is that area of psychology concerned with the measurement of individual differences in personality. Psychologists often attempt to measure and quantify how people differ on various personality characteristics through the use of personality tests. The purpose of a personality test is to measure one or more important aspects of a person's personality, such as assertiveness, creativity, or dominance. Psychologists believe that the scores that a person obtains on a personality test not only helps us understand that person a little better but also helps us predict how that person may act in the future.

Once a personality test is developed, it must undergo extensive research in order to determine just how good a test it is. In that regard, psychologists are usually most concerned with finding out if the test in question really does measure what it is supposed to be measuring, and whether or not the test provides the same results when a person takes it more than one time. For example, a personality test designed to measure creativity must really measure creativity, and not just intelligence, if it is to be considered a good or valid test of creativity. Psychologists are constantly designing research to answer questions having to do with test validity and reliability. The results of such research often leads to the revision of old personality tests and/or the development of new ones.

The four questionnaires you completed today are typical of personality tests that professional psychologists currently use. One of them, the Singer-Loomis Inventory of Personality (or SLIP, for short), is very new and its validity has not been extensively investigated. The purpose of my study is to further evaluate the validity of the SLIP. That is, I want to further pursue the question, "Does this test really measure what it is supposed to?".

One method of evaluating the validity of a new personality test, such as the SLIP, is to compare its results with those of older, more "proven" tests which

supposedly measure the same things. That is one method I am using in this study. The SLIP was designed to measure six personality traits that Carl G. Jung outlined in his famous theory of personality types. These traits are called introversion, extraversion, thinking, feeling, sensing, and intuiting. Two of the other questionnaires you completed today, the Eysenck Personality Questionnaire (EPQ), and the Myers-Briggs Type Inventory (MBTI), were also designed to measure some or all of the same six Jungian traits. These two tests have been extensively evaluated and psychologists generally consider them to have fairly high levels of validity. By comparing the results of the SLIP with the results of the EPQ and MBTI (through the use of correlation and other mathematical procedures) I will be able to make some statements about the validity of the SLIP.

I am sorry that I am unable to give you individual feedback about your scores on the questionnaires. What I hope you have gained by participating in my project is the experience of taking personality tests that professional psychologists commonly use, and an introduction to the research concerns that psychologists have when developing a new personality test. I have listed a reference below for you to read if you are interested in finding out more about the specific area of study in which I am involved. If you have any questions about my study, please feel free to call me at 935-2705.

Sincerely,

Greg Gilliam
Ph.D. candidate
Clinical Psychology Department

Loomis, M. (1982). A new perspective for Jung's typology. Journal of Analytical Psychology, 27, 59-69.

Loomis, M. & Singer, J. (1980). Testing the bipolar assumption in Jung's Typology. Journal of Analytical Psychology, 25 (4), 59-69.

APPENDIX B

LIST OF SINGER-LOOMIS INVENTORY OF PERSONALITY ITEM NUMBERS
WHICH CORRELATED LESS THAN .30 WITH ASSIGNED BASIC
OR COMBINED SCALES

<u>SCALE</u>															
IT	IF	IS	IN	ET	EF	ES	EN	T	F	S	N	E	I	J	P
11.*	7.*	105.	1.			58.		11.*	7.	8.	1.*	2.	1.*	3.	1.
	103.		23.						50.	9.	5.*	34.	7.*	4.	2.
	114.								52.*	26.	46.	36.	8.	7.	5.
									57.	58.	60.	52.	11.*	11.*	8.*
									84.	96.	62.	56.	18.	25.	9.
									103.	105.*	65.	57.	41.	27.	26.
									106.		87.	58.*	43.	39.	33.
									25*			68.	50.	42.	46.
									114.*			110.	64.	50.*	47.
													74.	52.	54.
													87.	57.*	58.*
													103.	59.	60.
													105.*	68.	62.
													106.	71.	64.
													112.	74.	85.
													114.*	82.	72.
														91.	86.
														99.	87.
														100.	104.
														103.	105.*
														106.	
														114.*	112.

*Item also failed to correlate with assigned scale at .20 level.

LIST OF SINGER-LOOMIS INVENTORY OF PERSONALITY ITEM NUMBERS
WHICH FAILED TO CORRELATE MOST HIGHLY WITH
ASSIGNED BASIC OR COMBINED SCALES

<u>ASSIGNED BASIC SCALE</u>							
IT	IF	IS	IN	ET	EF	ES	EN
75.(ET)	7.(EF)	96.(IN)	23.(ET)		4.(ES)	79.(EN)	60.(ET)
107.(IS)		117.(ES)	62.(IF)		25.(ES)	98.(IT)	92.(IN)
					100.(EN)		
<hr/>							
<u>ASSIGNED COMBINED SCALE</u>							
T	F		S		N		
115.(S)	4.(S)		9.(F)		5.(T)		
	25.(T)		32.(N)		14.(F)		
	50.(N)		34.(F)		23.(T)		
	52.(T)		40.(F)		24.(T)		
	84.(T)		58.(N)		60.(T)		
	100.(N)		72.(T)		65.(T)		
	103.(T)		79.(N)		78.(S)		
	116.(T)		90.(T)		88.(S)		
			96.(N)				
			98.(T)				
			104.(T)				
			105.(F)				

Note. Letters in parentheses represent the scale with which that item correlated most highly.

LIST OF SINGER-LOOMIS INVENTORY OF PERSONALITY ITEM
NUMBERS WHICH FAILED TO CORRELATE MOST HIGHLY WITH
ASSIGNED BASIC OR COMBINED SCALES
(CONTINUED)

<u>ASSIGNED COMBINED SCALE</u>			
I	E	J	P
<hr/>			
7.	20.	4.	5.
11.	34.	18.	9.
17.	37.	20.	14.
21.	51.	39.	15.
23.	56.	42.	21.
41.	76.	50.	23.
43.	77.	71.	24.
49.	92.	82.	54.
85.	98.	91.	60.
93.	101.	100.	65.
113.	110.	109.	66.
117.		114.	72.
		115.	90.
			98.
			104.

Note. If an item failed to correlated most highly with its assigned introversion scale, it automatically correlated most highly with the extraversion scale, and vice-versa. The same holds true for the J and P scales.

APPENDIX C

THE SINGER-LOOMIS INVENTORY OF PERSONALITY
(SLIP) (Singer & Loomis, 1984)

Introduction

The Singer-Loomis Inventory of Personality (SLIP) is a self-description. It provides you with an opportunity to clarify your own personality as you see it.

There are no right or wrong answers. This Inventory is not a measure of intelligence. It is not an indicator of emotional problems. It does not show how well you function in comparison with other people.

This Inventory is a key to understanding the nature of your own habit patterns, your usual ways of approaching tasks or situations. One way of reacting is not better or worse than any other, but there are differences. Each person tends to respond more frequently in some ways than in others.

There is no time limit to this Inventory, but it is best not to mull over the situations. Indicate what you would actually do in a situation such as the one described. We are not interested in what you think you should do, or what the right thing to do may be. We are interested in what you actually would do.

If there is a situation in which you cannot possibly imagine yourself, you may skip that situation entirely, and skip the corresponding numbers on your score sheet. However, if at all possible try to answer every situation.

Directions

Do not write in this booklet. Use answer sheet and scoring forms for your responses.

Items 1 through 8 are responses to the first situation. Mark each response on a scale of 1 to 5, where:

- 1 is never
- 2 is occasionally
- 3 is about half of the time
- 4 is usually
- 5 is always

Fill in the blank that most closely corresponds to what you would do. For each situation you answer, you must fill in a blank for each of the response possibilities.

Items 9 through 16 are responses to the second situation. Continue filling in a blank for each response possibility until you have answered all 15 situations. You will have marked 120 blanks.

Mark your responses on the separate answer sheet.
MAKE NO MARKS ON THE TEST BOOKLET

1	2	3	4	5
never	occasionally	about half of the time	usually	always

Basic Scale
Assignment

SITUATION #1

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

- | | | |
|----|----|---|
| IN | 1. | imagine what is possible, then wait to see what the day brings before I decide. |
| ES | 2. | participate in some sport with other people. |
| ET | 3. | spend part of the day working in a group doing something of importance. |
| EF | 4. | try something new with a few friends. |
| EN | 5. | anticipate going with my group to a benefit for a worthwhile charity. |
| IT | 6. | do some of the planning and organizing that I have been putting off. |
| IF | 7. | call up the theatre and reserve a ticket for a show I've been wanting to see. |
| IS | 8. | stay home alone and get into one of my hobbies like gardening, painting, woodworking, music, or yoga. |

SITUATION #2

I am at home with a person I care about. We have just finished a pleasant evening meal. I would be inclined to

- | | | |
|----|-----|---|
| IS | 9. | relax in the warm glow of well-being. |
| IF | 10. | appreciate how wonderful this person is to me. |
| IT | 11. | read that book I've been meaning to get to. |
| ET | 12. | use the time to plan our next project and set priorities. |

1	2	3	4	5
never	occasionally	about half of the time	usually	always

- EF 13. be especially sensitive to any disturbances in our relationship.
- EN 14. speculate on where we might spend our vacation.
- ES 15. help with the dishes and putting the house in order.
- IN 16. daydream about the future.

SITUATION #3

If I had to come up with a suggestion for improving schools in my community, I would

- IT 17. clarify my objectives and outline a step-by-step progression toward my goals.
- IF 18. suggest the kind of activities I would enjoy in my school.
- ET 19. suggest that we as a group examine the causes of our difficulties and determine what ought to be done about them.
- EF 20. respond to what the students like.
- IS 21. study carefully the present school budget and course of studies.
- ES 22. work on a fact-finding committee that would check on possible leakage of funds in such places as the cafeteria, bookstore, etc.
- IN 23. look at the problems from a variety of perspectives.
- EN 24. brainstorm with others to envision original ways of raising money for the schools.

SITUATION #4

I see a report on television about a catastrophe in a distant land. I would

- EF 25. volunteer to contact my neighbors for contributions for relief for the victims.
- ES 26. advocate a commission to inquire into exactly what occurred and what the situation is now.
- IF 27. experience it almost as a personal tragedy.

1	2	3	4	5
never	occasionally	about half of the time	usually	always

- EN 28. estimate the high cost to life and property.
- IT 29. read the paper for further details.
- IN 30. wonder what I would do if I were caught in such a situation.
- ET 31. discuss the need to work out a disaster plan for our own community.
- IS 32. watch with interest all the television coverage.

SITUATION #5

I come home after a hard day at work, tired and depressed. I would be likely to

- IN 33. get away from the others and try to figure out what went wrong.
- ES 34. go with someone for entertainment such as dinner and a show.
- ET 35. phone a co-worker to discuss the problems that arose during the day, and try to determine together what caused them.
- EF 36. share with others the things that are bothering me.
- EN 37. imagine what things could be like at work if we could do some of the things a few of us have talked about.
- IT 38. reflect on how I might change my way of handling things.
- IF 39. ask myself if I really want to keep working there.
- IS 40. get something to eat and stretch out on the couch.

SITUATION #6

We've had three weeks of intolerable weather. I look out the window on a weekend morning and see more of the same. I would

- IS 41. thumb through the travel section of the paper and clip articles on likely spots to visit.
- IF 42. entertain myself at home with my favorite situation comedy television programs and good music.

1	2	3	4	5
never	occasionally	about half of the time	usually	always
IT	43.	use the time to do some paper work that I should have done long ago.		
ET	44.	start some projects that need to be done around the house and get others to help.		
EF	45.	decide I might as well enjoy it and invite some friends to dinner.		
EN	46.	play a game like blackjack or poker.		
ES	47.	call up some friends to join me in some physical sport.		
IN	48.	speculate on where I could live where I would not have to endure this.		
SITUATION #7				
I am aware I do not have as much control as I would like over a certain habit (for example: smoking, alcohol, drugs, overeating, overworking). My response to this insight would be to				
ET	49.	set up a daily plan to reward myself as I change my behavior.		
IF	50.	become depressed and blame myself.		
ET	51.	examine what causes me to fall into this pattern.		
EF	52.	seek professional help.		
IS	53.	become aware of what I'm doing to my body.		
ES	54.	join a self-help group that records people's progress regularly.		
IN	55.	wonder if I can change.		
EN	56.	worry about what other people are thinking of me.		
SITUATION #8				
If I had the opportunity to engage in any vocation I would like, and training for it were available, I would choose to				
EF	57.	work at selling people on the value of my product.		
ES	58.	work with a skilled crew building or repairing equipment.		
IF	59.	seek a position that feels just right to me.		

1	2	3	4	5
never	occasionally	about half of the time	usually	always

- EN 60. work in an environment with people who would stimulate each other to be creative.
- IT 61. be in a position where I could organize my work for maximum efficiency.
- IN 62. work independently in a pleasant environment.
- ET 63. be a member of a problem-solving team.
- IS 64. work alone with figures, computers, or other instruments allowing exact methods and answers.

SITUATION #9

I wake up in the night. The fire alarm is going off and I smell smoke. Someone is in the next room. I would

- IN 65. see all the possibilities for escape and act as fast as I can.
- ES 66. call the fire department immediately and give them my name, address, telephone number, and nearest cross streets.
- ET 67. determine the source of the fire and take practical measures to put it out-if possible.
- EF 68. fear for the person and rush to the rescue.
- EN 69. try to put out the fire by any means at hand.
- IT 70. check the routes of escape.
- IF 71. be frightened for my safety.
- IS 72. follow the guidelines issued by the fire department.

SITUATION #10

My family is loving and supportive, but they don't understand what I am going to do. I would

- IS 73. let them see how I have already worked out all the practical details.
- IF 74. stick to my own beliefs no matter what anyone says.
- IT 75. point out to them the possibilities for me if I follow this course of action.

1	2	3	4	5
never	occasionally	about half of the time	usually	always

- ET 76. acknowledge to them that because there are both pros and cons to this undertaking, it requires careful consideration.
- EF 77. want them to appreciate the value of this undertaking.
- EN 78. help them to visualize how it will affect them in the end.
- ES 79. give them the names of people involved in this to strengthen my position.
- IN 80. explain that I have not done this in the past but should do it now.

SITUATION #11

I am obliged to work on a project with a co-worker I don't like. I would

- IT 81. concentrate my efforts on the project, not the person.
- IF 82. keep quiet and leave the situation doing as little damage as possible.
- ET 83. try to determine ways in which we can reasonably work together.
- EF 84. talk with this person to find out how we can get along better.
- IS 85. recognize each of our skills and divide the labor accordingly.
- ES 86. tell my co-worker what it is like when we work under these conditions.
- IN 87. have great personal difficulty in getting past my objections.
- EN 88. say, "Let's find a way to get it done no matter what."

SITUATION #12

I have just been told on the telephone that someone very close to me has died suddenly. I would

- EF 89. be shocked and express my sadness to the person who called.
- ES 90. suggest practical ways I can help with the arrangements.
- IF 91. go off by myself and have a good cry.
- EN 92. wonder what the long-range effects of this persons death will be.

1	2	3	4	5
never	occasionally	about half of the time	usually	always

- IT 93. inquire about the funeral arrangements.
 IN 94. begin imagining how this will change my life.
 ET 95. arrange a telephoning plan to notify relatives and friends.
 IS 96. recall how the person looked the last time we were together.

SITUATION #13

I am going shopping to buy some clothing for myself. My budget is limited. I would

- IN 97. try to picture how I would look in these clothes.
 ES 98. choose colors that coordinate with what I already own.
 ET 99. consider the salesperson's views before I buy anything.
 EF 100. select something fashionable that will impress my friends.
 EN 101. visualize myself wearing an outfit that would win admiring glances.
 IT 102. sit down and plan what I need and budget how much to spend on each item.
 IF 103. know immediately what would look good on me.
 IS 104. choose something that suits my lifestyle.

SITUATION #14

I wake up feeling sick. I have several commitments for today. I would

- IS 105. stay in bed and pay attention to my body.
 IF 106. give in to my feelings because it is the right thing to do under the circumstances.
 IT 107. consider the pros and cons of cancelling my commitments.
 ET 108. phone someone to take over and explain exactly what needs to be done.
 EF 109. ask for a little tender loving care.
 EN 110. lie there and wonder what is happening where I am supposed to be.
 ES 111. call the doctor to relate my symptoms and recall their history.

1	2	3	4	5
never	occasionally	about half of the time	usually	always

IN 112. worry that perhaps some people will think I am not able to do my job and that maybe they will find someone else.

SITUATION #15

I am involved in an argument with an older member of my family over something I want to do, but that person disapproves. I would

- IT 113. consider the other person's arguments and weigh the evidence before I act.
- IF 114. do what seems best to me despite what the other person says.
- ET 115. present reasons why my position is justified.
- EF 116. modify my position to keep peace in the family.
- IS 117. gather together all the facts and then point them out.
- ES 118. explain in detail what the results will be if I do what I have proposed.
- IN 119. worry about what might happen if I don't get my way, and try to think up some alternatives.
- EN 120. point out, using many examples, that my friends and other people are doing this.

APPENDIX D

SINGER-LOOMIS INVENTORY OF PERSONALITY (SLIP) AND
MYERS-BRIGGS TYPE INDICATOR (MBTI) CLASSIFICATION
COMPARISON TABLES

		MYERS-BRIGGS TYPE INDICATOR		
		E	I	<u>n</u>
SINGER-LOOMIS INVENTORY OF PERSONALITY ^a	E	21 (13.55)	6	27
	I	93	111 (103.21)	204
	<u>n</u>	114	117	231

$\underline{k} = .13, p < .05$

Note. E = Extraversion; I = Introversion

		MYERS-BRIGGS TYPE INDICATOR		
		S	Not S	<u>n</u>
SINGER-LOOMIS INVENTORY OF PERSONALITY ^a	S	45 (37.35)	32	77
	Not S	69	85 (79.93)	154
		114	117	231

$\underline{k} = .12, p < .05$

Note. S = Sensation

^aTies excluded.

CLASSIFICATION COMPARISONS (CONTINUED)

MYERS-BRIGGS TYPE INDICATOR				
		N	Not N	<u>n</u>
SINGER- LOOMIS INVENTORY OF PERSONALITY	N	52 (51.48)	51	103
	Not N	65	62 (65.52)	131
	<u>n</u>	117	117	234

$$k = -.03, \text{ n.s.}$$

Note. N = Intuition.

MYERS-BRIGGS TYPE INDICATOR				
		T	Not T	<u>n</u>
SINGER- LOOMIS INVENTORY OF PERSONALITY	T	64 (58.36)	72	136
	Not T	36	62 (56.02)	98
	<u>n</u>	100	134	234

$$k = .10, p < .05$$

Note. T = Thinking.

CLASSIFICATION COMPARISONS (CONTINUED)

MYERS-BRIGGS TYPE INDICATOR				
		F	Not F	n
SINGER- LOOMIS INVENTORY OF PERSONALITY	F	86 (72.02)	40	126
	Not F	48	60 (46.28)	108
	<u>n</u>	134	100	234
$k = .24, p < .001$				

Note. F = Feeling.

MYERS-BRIGGS TYPE INDICATOR				
		J	P	n
SINGER- LOOMIS INVENTORY OF PERSONALITY ^a	J	77 (72.1)	73	150
	P	33	48 (42)	81
	<u>n</u>	110	121	231
$k = .09, n.s.$				

Note. J = Judging; P = Perceiving.

^aTies excluded.

CLASSIFICATION COMPARISONS (CONTINUED)

		SINGER-LOOMIS INVENTORY OF PERSONALITY ^a								
		IT	IF	IS	IN	ET	EF	ES	EN	<u>n</u>
MYERS-BRIGGS TYPE INDICATOR	I-TP	4 (4.49)	2	4	6					16
	I-FP	4	7 (4.87)	5	11	1				28
	IS-J	17	6	8 (8.74)	9	2	1		1	44
	IN-J	4	4	3	2 (3.49)	1		1	1	16
	E-TJ	5	3	4	1	2 (.66)	1			16
	E-FJ	9	4	5	2	1	3 (1.5)			24
	ES-P	6	6	2	5		3	0 (.23)	1	23
	EN-P	8	6	10	8	2	5	1	1 (.83)	41
	<u>n</u>	17	38	41	44	9	13	2	4	208

k = .01, n.s.

Note. Classifications refer to each instrument's profiles for Jung's eight basic types. IT (I-TP) = Introverted thinking; IF (I-FP) = Introverted Feeling, etc.

^aTies excluded.

APPROVAL SHEET

The dissertation submitted by Silas Gregory Gilliam has been read and approved by the following committee:

Dr. John R. Shack, Director
Associate Professor, Psychology, Loyola

Dr. Alan S. DeWolfe
Professor, Psychology, Loyola

Dr. Jerome P. Wagner
Associate Graduate Faculty, Psychology, Loyola

The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval by the Committee with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Date

4/10/83

Director's Signature