A METHOD OF ASSESSING JUNGIAN PSYCHOLOGICAL TYPE DEVELOPMENT IN A HIGH SCHOOL STUDENT SAMPLE

BY

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A Discrepancy Index designed to indicate the level of psychological type development at which a person is functioning was constructed and evaluated. The index was derived from the following three categories of discrepant or inconsistent responses to the Myers-Briggs Type Indicator (MBTI): (1) when a person has a very low overall score in general for a particular scale of the MBTI; (2) a person gives answers favoring one pole of a scale on the word-pair items and then chooses the opposite pole on the phrase questions, or vice versa; and/or (3) a person gives answers favoring one pole or an MBTI scale on the x or y-half of the MBTI and then favors the opposite pole on the other half.

The focus of the study was to determine, in a large sample of metropolitan Florida high school students (N = 485), whether the Discrepancy Index has the capability to differentiate between students high and low in level of moral reasoning and high and low on academic variables (overall and academic grade point average and class rank).

It appears that the Discrepancy Index dealing with strength of preference has discriminating power. As predicted, students expressing high preference for their perceptive function, whether it is for Sensing or for Intuition, fared better academically than students with low preferences for their perceptive function. A similar relationship existed for high Moral Judgment Scale score and high preference for their judging function, either Thinking or Feeling.

The Discrepancy Indices for word-pair/phrase discrepancy and x-y half differences need further adjustment and re-evaluation. As constructed for the present study they predicted very little. More sensitive dependent measures than grade point average should be utilized.

Results of the study do provide evidence that assessment of "within type" differences is reasonable and possible, and that strong, clear preference appears to be an important and measurable component of good type development. The results obtained provide further support for the theoretical assumption that it is the clarity and degree of development of a preference, and not <u>which</u> preference is favored, that accounts for competence in perception and judgment.

CHAPTER I
INTRODUCTION

Purpose of the Study

The purpose of this study was to evaluate the validity of a Discrepancy Index designed to indicate the level of psychological type development at which a person is functioning. The Discrepancy Index was constructed from three categories of discrepant or inconsistent responses to the Myers-Briggs Type Indicator (MBTI).

Statement of the Problem

Some of the problems facing the public school system have reached or are reaching a crisis point. The push for accountability in schools is gaining momentum. When large proportions of students cannot pass functional literacy tests it is no surprise that the schools bear the burden of blame.

Part of the total problem is that there is no consensus among members of the American public as to what the schools should, in fact, be teaching. Once goals are clearly delineated by school administrators and curriculum planners, the important question then becomes how to teach that which is supposed to be taught (a matter of methods rather than of goals). One method which has surfaced is the attempt to individualize the educational process. A problem

here is to find ways to individualize instruction while achieving cost efficiency. The successful individualized approach will be one which provides a straightforward and inexpensive way to discover and deal with individual differences of students in their own approaches to learning situations. A great deal of research on individualizing instruction is taking place all over the country. It is this researcher's belief that if we cannot very soon, and on a large scale, satisfactorily implement in the classroom the fruits of these researches, the movement to individualize will go the route of so many other short-lived educational innovations.

Carl G. Jung (1921) proposed a theory of individual differences which is currently being examined and evaluated in educational settings as a means of individualizing instruction. Research has clearly established that people do differ in the basic preferences for the use of the psychological functions and attitudes proposed by Jung, and that these preferences make a difference in motivation, aptitude and achievement. In addition, students differ in the command that they have over their preferred functions. Teachers and counselors dealing with psychological type concepts in the classroom have made similar observations. In describing the psychological type preferences Jung (1921), Myers (1962) and others (McCaulley, 1978; Quenk, 1978; Van der Hoop, 1939; von Franz & Hillman, 1971) comment upon differences between persons with excellent type development and those

with problems in type development. In other words, it is expected that some individuals will have developed their preferred process or function to a greater extent than others preferring use of the same function. The degree to which students have developed their preferred functions has implications for how well they perform in day-to-day situations which call upon their powers of perception and their powers of judgment. In this respect, the present study is at a far more individual and micro-level than that of dealing with basic type differences. The focus is on individual differences within types as much as with the differences between types which have been the concern of earlier research.

Knowledge of psychological type preferences of students is beneficial to educators and to students. In elementary level classrooms, however, it may not be necessary or even advisable to determine the type preferences of particular students. At this age level students are gaining experience and expertise in their own approaches to learning situations. Many elementary level teachers have found it useful, however, to estimate type through observation (Nuernberger & Lawrence, 1974). Knowledge of activities that appeal to students with different psychological type preferences allows the instructor to offer a "smorgaasbord"--where, indeed, there is something for everybody and students can gain experiences which develop all their powers of perception and judgment.

By the time a student reaches the high school level, an indication of the type preferences of the individual becomes relevant for more than understanding communication between teachers and students. It becomes relevant for decisions about lifelong goals, including career decisions. It is particularly important for students experiencing academic difficulty, and for their teachers, to assess not only their type preferences but to determine whether or not they really have command over the psychological functions they prefer to use. It is for these students that the educational dollar to individualize instruction can have the highest return. Public Law 94-142 has mandated the development of highly individualized educational programs for all handicapped learners. Learning disabled students are a target group for highly individualized instruction. Use of the MBTI to assess type preferences of learning disabled students is being explored (Metts, 1979).

At this point in time we can assess the basic type preferences with a considerable degree of reliability. The pressing problem is to discover a reliable means to appraise "the potent but as yet unmeasurable variable of 'type development'--i.e., the extent to which the person actually has developed the processes and the attitudes which he prefers" (Myers, 1962, p. 19).

Theoretical Basis for the Study

The approach to individualizing instruction being utilized in the present study is based on Carl G. Jung's

theory of psychological types (1921). The theory is highly relevant to education because it focuses on the individual's conscious use of his/her powers of perception and his/her powers of judgment. The theory begins at the point where the students focus their attention to take in information or know something (perceive) and then to decide or come to conclusions (judge) about it. Some students will naturally be better at perceiving than judging and vice versa, but all individuals need to develop their full potential for both processes.

An instrument, the Myers-Briggs Type Indicator (MBTI), designed to implement Jung's theory of psychological types, was developed by Isabel Myers in the 1940's. After careful study and evaluation, the MBTI was published as a research instrument by Educational Testing Service in 1962 and as a tool for general professional use by Consulting Psychologists Press in 1975. A substantial body of research using this instrument in education is available (Bibliography, Center for Applications of Psychological Type, 1981).

Psychological type differences have been fruitfully studied. Attempts to individualize instruction based on these findings are meeting with success. Gifted students and others with special talents have been studied from the perspective of psychological type differences. Increased knowledge of student preferences for educational media based on type differences is emerging (Anast, 1966; Golanty-Koel, 1977; Williams, 1973). A substantial proportion of the

literature on psychological type differences in students deals with academic aptitude and performance. With so much current interest in cognitive structures, perceptual organization, and teaching and learning "styles" it is not surprising to find a large proportion of studies in those areas taking psychological type variables into account in settings that range from middle school through graduate and professional training. Research over more than three decades has established the reliability of the MBTI (Carlyn, 1977; Coan, 1978; Myers, 1962) and the practical utility of Jung's theory in the educational process (Neurnberger & Lawrence, 1974; McCaulley, 1974, 1976a, 1976b; von Franz & Hillman, 1971; Wickes, 1966).

Myers (1980) considers a major goal of education to be the fostering of psychological type development in order to improve and enhance learning and to prevent or head off future problems. In this writer's opinion we have reached a major roadblock in accomplishing this goal, and an obstacle for psychological type research in the educational process in general. We have looked extensively at basic type differences between students in all sorts of fields, programs and settings. What we do not yet know is the amount of variance in our studies that might potentially be accounted for if we could identify persons who are at a <u>high level</u> of type development (regardless of which preferences they like and use best) from those who are less differentiated and at <u>low levels</u> of type development.

Before we can study this issue further, we must have a way to measure type development. Research related to education employing the MBTI has not yet dealt centrally or systematically with the issue of individual differences in type development. There are several clues that such studies will be productive. Myers (1962) found underachieving students in her sample to have lower internal consistency measures on the MBTI than high achievers. She also found aptitude and achievement scores for high school and college students in her sample to be lower for those potentially less clear about their type preferences.

Focus of the Present Study

In day-to-day situations, inconsistent or discrepant responses to an MBTI scale are being interpreted as suggestive of inadequate development of the psychological process that the scale measures. Before any lack of development can be assumed to exist, more direct evidence regarding the meaning of inconsistent response patterns must be established.

It was the focus of the present study to construct and evaluate one possible index of level of psychological type development. The focus was three-fold. First, a Discrepancy Index was created which operationalizes the concepts of inconsistent response and strength of type preference. The inconsistencies or discrepancies upon which the Discrepancy Index was built are: (1) when a person responds or gives answers favoring one pole of an MBTI scale

on the X or Y-half of the MBTI and then favors the opposite pole on the other half; (2) a person gives answers favoring one pole of a scale on the word-pair items of the MBTI and then chooses the opposite pole on the phrase-question items, or vice versa; and/or (3) a person has a very low overall score in general for a particular scale of the MBTI.

Secondly, it was determined whether, in a large sample of high school students (N = 485), a relationship exists between discrepant responding on the MBTI as measured by the Discrepancy Index and students' responses to a Moral Judgment Questionnaire. The Moral Judgment Scale was developed by Maitland and Goldman (1974) to assess the level of development of moral reasoning (judgment) that a person employs.

Finally, the academic and overall gradepoint average and class rank of students with low Discrepancy Index scores were compared with those of students with high Discrepancy Index scores to determine whether a relationship exists between discrepant response pattern and measures of academic performance.

It was also expected that students with a high Discrepancy Index score on the Sensing-Intuition (S-N) scale of the MBTI would have lower reading levels than students with low Discrepancy Index scores on the S-N scale. Reading test scores could be made available from school records for so few students that this relationship was not tested formally in the present study. English teachers did provide the investigator with estimates of students' reading level.

Supplemental analyses of these estimates of reading level with Discrepancy Index scores were performed and are reported in Appendix A.

Hypotheses

H^1 Students who respond in a consistent and non-discrepant pattern on the MBTI will employ a higher level of moral reasoning than students who respond in an inconsistent and discrepant pattern on the MBTI.

H^2 Students who respond in a consistent and non-discrepant pattern on the MBTI will have demonstrated higher academic performance than students who respond in an inconsistent and discrepant pattern on the MBTI.

H^3 Students with low Discrepancy Index scores on the Thinking-Feeling scale of the MBTI when it represents their theorized Dominant Function will employ a higher level of moral reasoning than students with high Discrepancy Index scores on the T-F scale when it represents their theorized Dominant Function.

H^4 Students with low Discrepancy Index scores on the Sensing-Intuition scale of the MBTI when it represents their theorized Dominant Function will have attained a higher academic and overall grade point average, or higher academic and overall class rank than students with high Discrepancy Index scores on the S-N scale when it represents their theorized Dominant Function.

CHAPTER II
RELEVANT LITERATURE

In the first portion of this chapter the basic concepts of Jung's theory of psychological types are reviewed and the developmental aspects of the theory explicated. In part two research and clinical observations related to the value of an individual's holding clear and consistent psychological type preferences are examined. Part three delineates an assessment problem in psychological type research.

Jung's Theory of Psychological Types

The Developmental Nature of the Theory

Increasing recognition of individual differences and the need to "individualize" the educational experience have led many educators to the study of psychological type differences. Many of these educators are attracted by the underlying assumption that the differences found between types represent alternative, but equally valid paths to the achievement of excellence.

Jung (1921) postulated individual differences in a person's preferences for mode of perception. Within the realm of perception, he proposed that some are sensors, preferring to glean knowledge as to what goes on around them from the physical senses, i.e., sight, hearing, touch, smell, and taste. These sensors strongly trust what their

experiences have told them. Jung stated that others are intuitives, preferring to perceive the world in terms of relationships, meanings and abstractions. These intuitors are often more concerned with what something means or might be than with what it is.

Jung proposed that individuals also differ in the type of judgment they rely upon. Some are thinkers, preferring to draw on their powers of logic and objectivity in making most decisions. Thinking types like best to utilize an impersonal approach in decision-making. The opposite type of person, Jung called feeling types, preferring to weigh all evidence within their own subjective value system as a basis for making decisions. Feeling types like best and trust most decisions where they have employed their own subjective criteria as to what is of highest value to themselves and to others in the situation.

The third individual difference in psychological type is in the basic orientation people take towards their environment. Extraverts are oriented toward the environment, incorporating it into their own self-system and drawing energy from it. Introverts are oriented away from the surrounding environment. The environment is more alien to them. It takes energy away from them. In contrast to the extravert, they draw their energy from their own inner world of thought and ideas. Jung's analysis of these differences in perception (Sensing and Intuition) and judgment (Thinking and Feeling) as they interact with basic

orientation towards the environment (Extraversion and Introversion) have been seen empirically to organize, within a powerful theoretical framework, many valuable observations of the educational process.

In psychological type theory each of the four functions (Sensing, Intuition, Thinking, and Feeling) and orientations (Extraversion and Introversion, sometimes called attitudes) described by Jung is essential, and all of them are used by every individual. The functions and attitudes are not equally preferred, however, by all individuals. These basic differences in preferences lead to differing priorities of development, with the most preferred functions being differentiated earlier than the less preferred ones.

Jung's psychological theory places great emphasis on consciousness. As precisely stated by Fordham,

> In attempting to divide human beings into recognizable types, Jung is dealing mainly with the psychology of consciousness; when a person is described as either extraverted or introverted, it means that his habitual conscious attitude is either the one or the other. A balanced attitude would include equally both extraversion and introversion, but it frequently happens that one attitude is developed and the other remains unconscious. No one, however, lives completely as one or the other, but manifests the unconscious attitude at times, though in an inferior way. (1966, p. 31)

Thus, Jung's theoretical position was that the process of becoming a mature person, termed individuation, is one of life-long development taking different forms that are related to the person's preferences in the use of perception and judgment. Jung considered each psychological type to be

a "normal" process of maturation. Quenk (1978) very clearly emphasized this position,

> Thus Jung was quite explicit in stating that the attitude and function types are not "pure" but orienting structures which reflect the habitual way in which a person behaves. In energic, libido terms, the attitude and function type are the vehicles for the flow and amplitude of psychic energy. As a psychology of character, then, the Typology is not a static, classificatory scheme, but a dynamic process through which adaptation to the world occurs. (p. 5)

Central to Jung's concept of maturation is "the process of becoming whole" (Fordham, 1966, p. 140). The key to this individuation process is the concept of making conscious the unconscious. Here Jung meant raising a person's level of awareness as to the existence of the differing approaches, which potentially increases the person's behavior repertoire and self-understanding. Most people use or rely heavily on one function; some use two. A highly differentiated or developed person uses three, and in rare cases, people exist who use all four functions (Sensing, Intuition, Thinking, and Feeling). The use of all four functions is the end-point or goal of the individuation process. This bears similarity to Maslow's construct called self-actualization. According to Fordham's interpretation (1966), the utilization of all four functions involves both "the individuation process, and the reconciliation of the opposing trends of one's nature" (p. 46). Thus, as the separate components of psychological type are explained in following sections it is important to bear in mind the dynamic, developmental underpinnings of Jung's theory.

Extraversion, Introversion, and the Four Psychological Functions

Jung considered the psychological type preferences to be dichotomous in nature--as "either-or" preferences. One either prefers the Introverted (I) or Extraverted (E) attitude, either Sensing (S) or Intuitive (N) perception, and either Thinking (T) or Feeling (F) judgments. There is a very logical ordering of the preferences from E-I to S-N to T-F. We direct our energy (E or I) to perceive a situation (S or N), and then to decide about it (T or F). Jung called Sensing and Intuition the "irrational" functions because they are processes or modes of perception. They are not decision-making functions. They give us first the percepts or information that later we may or may not use in making decisions or judgments. Perception is the process of cognition. We have utilized it when we say "I know" or "I see." Conversely, Jung called Thinking and Feeling the "rational" functions because they form the foundation of the decision-making process. They are two different avenues or approaches to coming to conclusions or judging about something.

It is necessary to acknowledge again that while Jung postulated the preference for E or I, S or N, and T or F to be "either-or" in nature, he did not mean that we utilize one preference to the total exclusion of the other. Fordham (1966) re-emphasizes this point,

> Since human nature is by no means simple, one rarely finds the absolutely pure type; often the main function is sufficiently clear to dub the

> person a thinker, an intuitive and so on, but it is seconded by another function which modifies and blurs the picture. Jung in fact refers to his description of types as "somewhat Galtonesque family portraits," for human nature refuses to be classified in a precise and simple way. All the same, the concept of types has great practical value as an aid to understanding in personal relationships and in education. (p. 45)

In more specific terms, extraversion or introversion indicates the direction of the individual's flow of energy. A person who prefers the extraverted orientation is most "at home" when energy and attention are focused on the outer world of people and objects. Persons preferring introversion are more comfortable in the inner world of their own thoughts and ideas. Kagan's "impulsive" and "reflective" dimensions reflect the Extravert-Introvert difference in orientation. Jung (1921) states,

> The introvert's attitude is an abstracting one; at bottom, he is always intent on withdrawing libido from the object, as though he had to prevent the object from gaining power over him. The extravert, on the contrary, has a positive relation to the object. He affirms its importance to such an extent that his subjective attitude is constantly related to and oriented by the object. (p. 329)

Next comes the perceptive function which is divided into the Sensing preference and the Intuitive preference (Sensing and Intuition are two of the four functions Jung refers to). The person who prefers sensing perception likes best to take in information (i.e., perceive) through direct use of and reliance upon the physical senses. This type of perception is that which is most trusted by the individual. Alternately, the person who prefers intuitive perception

likes best to "see" or perceive the possibilities extant in a situation rather than the concrete realities of it. For example, Intuitive types are often described as people with great powers of imagination. Likewise, Sensing types are often described as being superbly practical. This is no surprise, as the intuitive person relishes in seeing "what _might_ be" and the sensing person delights in clear perception of "what _is_."

Finally, having perceived a situation, we come to conclusions or decide about it. For this Jung said we utilize the judging function. The judging function is characterized by the preferences for Feeling judgments or for Thinking judgments (Feeling and Thinking are the other two of the four functions referred to by Jung). While every individual has the potential for both kinds of judgment, each person tends to prefer or favor one kind over the other. This leads to greater and greater development of the favored way. Persons preferring Feeling judgment like best to rely on their own value system to guide their behavior. The conscious and subjective weighing of things important to them and to others involved in a situation is a cornerstone of Feeling judgment. This process sheds light on the solution which can be most trusted and satisfying. Alternately, persons who prefer Thinking judgment trust and like best to decide based on what they believe to be the logic of the situation. Much emphasis is placed on the logical consequences of one decision as opposed to another (cause

and effect). The attempt at impersonal objectivity is a cornerstone of Thinking judgment.[1] William James was probably noting type differences in the Thinking and Feeling functions when he postulated his tough-minded and tender-minded types.

The Origin of Psychological Type Preferences

The origin of the attitude and function types is not certain. It remains the object of scientific inquiry. Jung (1921) stated that at first we might be erroneously inclined to consider such differences "as mere idiosyncrasies of character peculiar to individuals"; however, the differences in behavior are consistent enough to be highly predictable. He proceeded to state that these consistent differences are found across all ranks of society--

> Sex makes no difference either; one finds the same contrast among women of all classes. Such a widespread distribution could hardly have come about if it were merely a question of conscious and deliberate choice of attitude. In that case, one would surely find one particular attitude in one particular class of people linked together by a common education and background and localized accordingly. But that is not so at all; on the contrary, the types seem to be distributed quite at random. (pp. 330-333)

The type preferences show themselves in behavior very early. Von Franz and Hillman (1971) say in the crib, and Jung says on the first day of life. Jung seems to have ruled out

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[1] Jung's highly detailed descriptions of the attitudes (E or I) and the four functions appear throughout Psychological Types (1921), and in more condensed form in Chapter Eight of The Portable Jung, J. Campbell, 1971.

any strict Mendelian inheritance pattern from parents as the origin of type preferences. In other words, he could observe no pattern wherein two extraverted parents produce an extraverted child, or two sensing parents a sensing child. Indeed, present-day data reveal no inheritance patterns either. Jung hints, however, that biological and physiological factors probably play a primary role--

> In the same family one child is introverted, the other extraverted. Since the facts show that the attitude-type is a general phenomenon having an apparently random distribution, it cannot be a matter of conscious judgment or conscious intention, but must be due to some unconscious, instinctive cause. As a general psychological phenomenon, therefore, the type antithesis must have some kind of biological foundation . . . there are obviously individuals who have a greater capacity, or to whom it is more congenial, to adapt in one way and not in another. It may well be that physiological causes of which we have no knowledge play a part in this. I do not think it improbable, in view of one's experience that a reversal of type often proves exceedingly harmful to the physiological well-being of the organism, usually causing acute exhaustion. (pp. 330-333)

One avenue of inquiry which may eventually shed light on the origin of type preferences lies in investigation of the functioning of the right and left hemispheres of the brain. There may, for example, be a relationship between hemispheric dominance and preferred mode of perception (Sensing or Intuition). It would seem possible that preference for sensing could be correlated with left-hemispheric dominance and preference for intuition with right-hemispheric dominance. Whatever the explanation, Jung clearly suspected a biological basis for the type

preferences; an inborn predisposition to develop in one direction rather than another.

Both biology and environment play a role in the development of most human characteristics. Jung (1921) discussed how environmental influences (especially parents) can affect drastically what would be the normal type development of the child. But, he says these are extreme and abnormal cases and that

> As a rule, whenever such a falsification of type takes place as a result of parental influence, the individual becomes neurotic later, and can be cured only by developing the attitude consonant with his nature. (p. 332)

Jung thus thought environment very important, with possibilities existing both for falsification of type and for helping develop a basic predisposition. In the Inner World of Childhood, Wickes (1966) provides a further example of the forces affecting the personality type of a very young child,

> The closer the bond between the parent and child the more the child is molded not only by the conscious but also the unconscious demands of the parent, reacting in many ways as he is expected to react instead of in accordance with his individual type. Such a confusion produces a sense of unreality and makes the integration of the personality a difficult task. (p. 130)

Several writers have commented upon the effects the child's personality type has in the classroom, specifically in the relationship with the teacher. Wickes discussed the many ways in which the child is affected by school and ways that teachers or parents can ascertain (without

pigeonholing) clues as to psychological type of the child, and how to utilize that information to the best benefit of the child. Wickes (1966) offered the following anecdotal illustration of why clues as to the psychological type preferences of the child are important "tools" in the educational process,

> I have known schools where it was possible to predict the success or failure of a child of pronounced type as he advanced from grade to grade and teacher to teacher. In one class he would be spoken of as a boy with an interesting mind and showing promise of great ability; in the next as impractical, dreamy, inaccurate. Or the reverse type of boy would be first depreciated as too ready, lacking in imagination and originality, and in the next grade praised as a fine, accurate, responsive, careful pupil. These verdicts were primarily based upon the type attitude of the teacher and upon the form of work which she valued. The same is true of parents. They feel rapport with the child whom they can understand. (pp. 134-135)

Fordham (1966) states that it is of help to teachers to "realize that an introverted child, for instance, is not unhappy or unadapted if it does not join in activities with the same zest as extraverted pupils" (p. 45). She gives the following comparison of an extraverted and an introverted child:

> This [the extraverted child] is the type of child who is popular both with parents and teachers. He is spoken of as "well adjusted", and is often considered "brighter" than he really is because of his earlier development and his capacity to make a good impression.
>
> The introverted child is shy and hesitant. He dislikes all new situations, and even approaches new objects with caution, and sometimes with fear. He prefers to play alone, and have one, rather than many friends. Because of the widespread preference for extraversion, such

> introverted children often cause anxiety to parents, but they are just as "normal" and intelligent as the other type of child. They are thoughtful and reflective, and often have a rich imaginative life. What they need most is time to develop their less obvious gifts, and to learn to feel at home in the world. (p. 32)

These external forces (parental and societal, as well as all life experiences) can be positive or negative in their influence on type development. In the lifetime of an individual, the formal education process has the potential for extensive positive influence. With respect to the institution of education, Inlow (1970) states that the goals of formal education and of humanism go hand in hand, "First and foremost, individual man is of supreme worth. Furthermore, he is an emerging essence, with total personality fulfillment constituting both his birthright and his commitment" (p. 29). Inlow further comments that learners themselves are an important source of any curriculum, "No curriculum, irrespective of its antecedents, is functional unless it relates meaningfully to the differing interests, abilities, and needs of learners" (pp. 117-118). Myers (1962) has long favored the smorgaasbord approach, where students of all types find their psychological differences both respected and nurtured, and where there is an atmosphere that fosters fuller personality development. Such an approach serves a dual purpose; every child is provided opportunities to develop all functions, as well as develop his own preferred functions to a higher level of expertise.

Lawrence (1979), in his practical guide to learning styles, provides examples using psychological type concepts in developing school curricula, and specifically for planning instructional strategies for the classroom which "honor the rights of every type" (p. 27). He clarifies how type concepts suggest solutions for two of education's most persistent and perplexing problems. School personnel across the country report lack of student motivation a major problem. Lawrence (1979) suggests breaking motivation down into four parts corresponding to the four dimensions of psychological type as follows:

1. The extraversion-introversion preference shows the broad areas of a student's natural interest
2. The sensing-intuition preference reveals basic learning style differences
3. The thinking-feeling dimension shows patterns of commitments and values of a student
4. The judging-perceiving dimension shows work habits. (p. 24)

When these four natural motivators are taken into account, Lawrence suggests that teachers "can better direct student energies toward learning" (p. 24).

Lawrence describes another problem which is increasingly becoming known to educators and educational researchers dealing with psychological type data. He refers to it as "perhaps the most crucial unrecognized problem of American education" (p. 27). Lawrence is pointing to the biases of instruction that may actually operate to the detriment of students who prefer extraverted sensing (ES__ types). It is estimated (McCaulley, 1978; Myers, 1962) that these

extraverted sensing types make up about 70% of the general population, and hence approximately 70% of the average public school population. Two examples of these biases may serve to illustrate the problem. The classroom practice of presenting abstractions first and applications second appeals to and fits best the intuitive's learning style, not that of the sensing type. Secondly, biases favoring both introversion and intuition may exist in reading instruction. Lawrence explains,

> Probably the young child first encounters it in the teaching of reading. Of course, reading is primarily an introverted activity; it is done quietly by oneself. And it is fundamentally an intuitive activity, involving abstractions--the printed symbols. But reading need not be taught as if all students were introverts and intuitives. The skills of reading can be and are being mastered by students of all types, and they all can leave school with a positive attitude toward reading. Tragically many students are alienated by their first encounters with reading instruction. Type theory points to the probability that most of the alienated children are extraverted sensing types. There are data which indicate that the dropout rate is much higher among sensing children. (pp. 26-27)

In addition, Lawrence and others have noted that standardized test constructors seem to be biased toward intuitive intelligence (manipulating symbols, abstract thinking, the drawing of inferences, describing "how to" rather than doing). As a group, IN__ types score highest on intelligence tests, followed by EN__, IS__, and finally ES__ types. Even textbooks seem to favor the intuitive way of viewing the world. According to Lawrence, "The record of American education in the twentieth century is a record of

neglect of sensing intelligence . . . the kind of intelligence possessed by the majority of American students" (1979, p. 27).

The problems raised by Lawrence are matters of concern for educators who wish to take an active role in fostering the total development of their students. Empirical research dealing directly with these issues is needed. Fuller understanding of psychological type concepts and the process of type development offers great potential for developing better instructional strategies for individual learners.

Both internal and external forces have a role in the normal "unfolding" of the developmental process. It is the favored mode for perceiving and for judging which is naturally the one most utilized by the child. Habitual use, through reinforcement, makes for further development and expertise in the use of the preferred way of perceiving and the preferred way of judging. This habitual use of one's preferences produces sets of characteristics, values and behaviors which a person of a given type shares in common with other people of the same psychological type.

Humans, in general, seem to feel rapport with others who resemble them in the preferences for the psychological attitudes and functions. Van der Hoop's quote of the earth spirit's answer to Faust is illustrative, "That spirit thou resemblest, whom thou dost comprehend" (1939, p. 319).

Von Franz and Hillman (1971), in their treatise on psychological type, discussed the natural <u>initial</u> one-sidedness of the process

of development. In describing how our psychological type preferences affect our interpretation of the world around us Van der Hoop (1939) pointed out that our type differences have some far-reaching consequences--

> One's immediate experience of one's fellowman proves itself at once to be much more influenced by one's own personality than is one's experience of a natural object, and the way in which this experience is dealt with is likewise still more under this influence, since the different modes of psychological objectification are sometimes determined by typical attitudes. . . . In the various schools of psychology, this influence can frequently be clearly demonstrated. . . . Men of different types are not all equally interested in scientific problems. . . . Although I do not maintain that this recognition of a one-sidedness in conscious orientation according to type offers an explanation of all the varieties in outlook, this differentiation does, nevertheless, make it possible to get a better understanding of the one-sidedness in these points of view. (pp. 319-320)

An Interpretation of the Dominant and the Auxiliary Function

Having dealt briefly with what the basic type preferences are, Jung's description of the dynamic interplay of the preferences within a single individual can be reviewed. It is a gross oversimplification and probably an inaccuracy to deal with the effect of the preferences separately, without reference to one another, because the preferences have their joint effect in unison. To clarify this "orchestration" effect we must understand what Jung called the Dominant and the Auxiliary function.

The Dominant function for any individual is theorized to be the most conscious and most developed function of the

four functions. Therefore, the Dominant function is either Sensing perception <u>or</u> Intuitive perception, or either Thinking judgment <u>or</u> Feeling judgment. Also from the four functions, Jung postulated the existence of an auxiliary function. He stated (1921) that the auxiliary is "complementary," "relatively unconscious," and "in every respect different from the nature of the primary [Dominant] function" (pp. 405-406). We recall that the extraverted or introverted orientation indicates the direction of the individual's flow of energy; introversion toward the inner world of thought and ideas, extraversion toward the outer world of people, objects and events. Based on Jung's statement about the auxiliary function we can assume two things: (1) If the Dominant function is a judging function (thinking or feeling, whichever the person prefers), then the auxiliary function must be a perceptive function (sensing or intuition, whichever the person prefers); and if a perceptive function is dominant then the auxiliary function for that person must lie in a judging function; and (2) If the Dominant function for a person is extraverted, then the auxiliary function must be introverted; and if the Dominant function is introverted, then the auxiliary function must be extraverted. With regard to this Quenk (1978) stated, "A function cannot be both extraverted and introverted. Its directionality must be unitary" (p. 8). Myers (1962) had earlier come to this same deduction when she and her mother, Katharine C. Briggs, in the development

of the Myers-Briggs Type Indicator (MBTI) added the J - P Index to indicate whether the person uses a perceptive function (S or N) or a judging function (T or F) in the extraverted world (that shown most to others). As shown in Figure 2, the judging or perceptive attitude identifies (points to) the Dominant function for Extraverts and the auxiliary function for Introverts. According to Myers (1962), persons who prefer the extraverted orientation (prefer to direct energy to the outer world of people, places and objects) extravert their Dominant function. Introverts (prefer to direct energy to their own world of thoughts and ideas) introvert their Dominant function. The extraverts introvert their auxiliary function, and the introverts extravert their auxiliary function. According to Quenk (1978),

> It also follows that an extravert is more confident of his dominant function, especially as he receives confirmation from others. An introvert, because he extraverts his auxiliary [or second best] function, receives confirmation from the environment only for his auxiliary; he must rely on his self-awareness to ascertain his dominant function. . . . Jung has stated that extraverts fear their inner world just as introverts fear the outer world. (p. 10)

In line with this argument Plaut (1972) found that introverts have less confidence than extraverts in determining their dominant function.

In direct relation to this, Myers (1962) pointed out that all of us must live in both "inner" and "outer" worlds. Some prefer the outer world; some prefer the inner world.

According to Myers (1962), the excursion into the least liked place is delegated to the person's auxiliary function. With regard to the auxiliary function she stated,

> If he [the extravert] has no useful development of an auxiliary process, he will have little or no inner life, which will make him an extreme extravert, and better-balanced associates will find him superficial. . . . If the introvert has no useful development of an auxiliary process, his outer life will be a very awkward, accidental and uncomfortable affair. (pp. 60-61)

On the issue of extraversion, introversion, and the dominant and the auxiliary function Quenk (1978) further stated,

> The well-developed function is that function which has a definite directionality to its energic charge. Directionality is an all-or-none phenomenon. Metaphorically, one can only go in one direction at a time. Thus, as the functions become specialized their directionality can be seen as central to their development. (p. 12)

The "evolution" process of psychological type has been described by Van der Hoop (1939) as follows:

> A first point of difference between people of the same type is found in the stage of development which they have reached. In every type there is a simple form, in which the differentiation of the prevailing function has only just begun, and its modes of adaptation are still being tentatively tried out, although a clear preference for typical forms of adaptation can already be observed. At a later stage the dominating function has found its forms, controlling these with great assurance. Anything which is not in accord is, at this stage, suppressed. With a few people there follows a still further stage, in which the other functions are permitted more development, to compensate for any one-sidedness, and the pronounced typical picture is again modified to some extent by the unfolding of a fuller and richer expression of human nature. (p. 92)

In a lecture in Zurich, Jung (1928) further explicated the interplay of the functions in the natural unfolding process

of type development. He gave several behavior-based examples for recognizing functions at differing levels of development,

> Whether a function is differentiated or not can be recognized from its strength, stability, consistency, reliability and adaptedness. But inferiority in a function is often not so easy to recognize or to describe. An essential criterion is its lack of self-sufficiency and consequent dependence on people and circumstances, its disposing us to moods and crotchetiness, its unreliable use, its suggestable and labile character. The inferior function always puts us at a disadvantage because we cannot direct it but rather are its victim.

As a final point of clarification, Figures 1 and 2 may serve as aides to remembering the proposed nature of psychological type as a developmental schema.

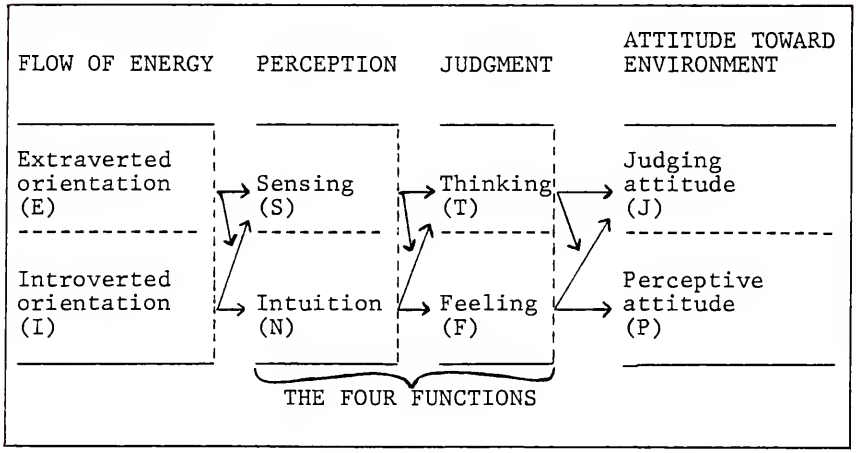

Figure 1. Diagram illustrating the basic psychological preferences.

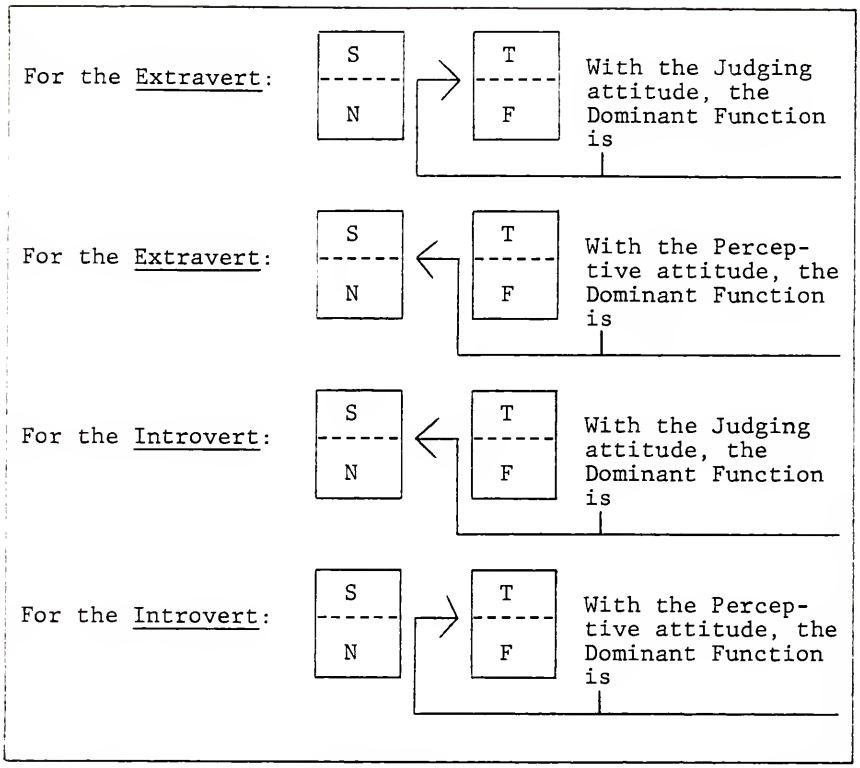

Figure 2. Myers' schema for determining dominant function.

Evidence Related to the Value of Clarity and Strength of Psychological Type Preferences

From the literature it is implied that being clear about one's psychological type preferences is a positive characteristic and being uncertain or arbitrary in the use of the preferences is a negative characteristic. As aforementioned, stable type differences are noticeable in very young children (Myers, 1962; von Franz, 1971; Wickes, 1966). From Jung's writings the following sequence of development

is inferred--individuals first develop and gain increasing expertise in their preferred modes of functioning. Only then can they begin to work on and consciously develop (at ease and with comfort and confidence) the functions they do not prefer. These lesser preferred functions are in theory those under the least conscious control of the individual. For most people such development is probably a life-long journey.

From a clinical perspective, Quenk (1978) offered the following comments regarding two possible problems in the process of type development. We are reminded that Jung considered development to be a process of individuation and differentiation, with great importance placed on extraversion and introversion,

> If both the auxiliary and dominant functions have the same directionality [extraverted or introverted], one can be confused for the other; i.e., they are undifferentiated. . . . Thus, as the functions [S-N and T-F] become specialized their directionality can be seen as central to their development. (pp. 12-13)

Quenk further stated that if the dominant and auxiliary were to have the same directionality (both introverted or both extraverted) then the "energic charge" of both would be lessened as it is shared by two functions. However, if one of them is extraverted and one is introverted then "the energic charge available to each would be greater, thereby assuring the differentiation of the two functions."

The second problem as viewed by Quenk (1978) was what he called the "fusion of functions"--

> Fusion is a blending of functions, e.g., thinking is fused with feeling, or sensation with intuition. If this occurs, it is a sad state of affairs. The manifestation of the function would be erratic and primitive. Fusion of functions is a sign of poor ego development and predisposes a person to an onslaught from the unconscious which may result in psychosis. It is the fusion of functions which is characteristic of latent psychosis, whereas confusion of functions [with dominant and auxiliary both introverted or both extraverted] may result in neurosis. Thus, determining which of the functions is undifferentiated and the extent to which there is fusion or confusion of functions is one means by which ego strength can be ascertained. (pp. 12-13)

Myers (1962) does offer an opinion and some evidence that clarity and/or strength or preference as assessed by the MBTI may provide a clue in the eventual understanding of the complex phenomenon of type development. Preference scores on the MBTI reflect the strength with which a preference is reported. Myers points out that mean strength of a preference varies from preference to preference (scale to scale) and from one kind of group to another (age groupings are theoretically relevant here). It is helpful to refer any individual's preference score to the group to which they belong,

> A preference score well above the mean is likely to indicate a strong and conscious preference, which will demand an outlet in the person's work and make him dissatisfied with any job that does not give it exercise and scope. Scores in the neighborhood of the mean are thought to reflect, on the average, a moderate to strong preference, with enough development of its attendant qualities to affect definitely the person's happiness and effectiveness in his job. With scores well below the mean there may <u>or may not</u> be an important development of the preference. And with really small scores the preference itself may be in considerable doubt. (p. 69)

In a seventh and eighth grade college preparatory population and in college populations Myers found the preference for N, and for I and J in combination, to be significantly related to grade point average. The point of relevance here is that Myers also found strength of preference to be related to mental age (as well as to chronological age as implied by van der Hoop). In her gifted sample Myers found relatively higher preference scores for both males and females when compared with others in their age group. Myers found major differences in the regression of IQ on mean preference scores for EI, TF, and JP. For each of these three scales, as strength of preference increased so did mean IQ scores, creating U-shaped curves. With respect to S-N, Myers found a higher preference for Sensing to be associated with lower mean IQ scores in the high school sample. Myers suggested this finding may be more indicative of the Intuitive type's greater interest in scholastic or academic activities in general. She warns against the interpretation that as preference for Sensing gets stronger grades get lower.

In a related investigation, Weychert (1975) found the mean IQ for Intuitive males to be 13 points higher than for Sensing males and 16 points higher for Intuitive females than for Sensing females. Weychert points out that this further substantiates Myers' findings regarding the effect on intelligence of clarity or strength of preference on the

S-N scale because Weychert used only subjects with moderate to high preferences on S-N (some of the variance in Weychert's study was thus automatically removed). It should be further noted that Weychert did not find Sensing types achieving in a manner inconsistent with their aptitude--as the Sensing preference was reported stronger and stronger, grades did not get lower and lower. While "leveling off" of grades occurred with increasing preference for Sensing (i.e., grades did not get lower and lower as Sensing was more strongly reported), it should be remembered that for extreme scores on all the other preferences aptitude increased with extremity of score (Myers, 1962). Weychert suggested that future studies include all scales of the MBTI rather than just one (S-N); and that all students rather than just those with moderate to high preferences be included. The failure to do either of the above could mask interactions.

It is noteworthy that Myers (1962) issued a strong warning <u>against</u> taking the strength of preference scores for an individual as a <u>direct</u> measure of the excellence of the type development.

> Scores measure the reported strength of a preference. The report may for many reasons not reflect the true strength, either through accident, or through the well-known hazards of self-report, or because of unusual appreciation or supplementary development of the opposite process or attitude, which would be admirable rather than detrimental.
>
> Even the true strength of the preference may not accurately reflect the actual degree of

> development. Therefore high scores should not be equated to excellence, nor low scores to deficit, unless there is positive external evidence that excellence or deficit exists. In the latter case the low score, while not adequate evidence in itself, may provide a clue which the counselor could find useful in understanding and seeking to remedy the difficulty. (p. 73) [underlining by the present writer]

Following up on Myers' statements regarding quantitative interpretation of MBTI preference scores, Morse (1975) provided a table of distributions of random scores on the MBTI, as well as a table of probabilities that any given type could result by chance response. His purpose was to provide "an objective and familiar decision-making technique by which to evaluate a given score, independent of any other score by any other person" (pp. 1-2). Morse's calculations were utilized further in the development of the Discrepancy Index described in Chapter III, where specific ranges for low, moderate and high preference scores were set.

Other than size of the preference score as an indication of strength of preference, there are two other clues internal to the scoring of the MBTI which warranted investigation. They are clues as to the clarity with which a preference is held. One is the split-half reliability measure. If a person is clear about preference it can be hypothesized that they will come out relatively the same on the x-half as on the y-half. The other is the phrase question/word-pair comparison. Again, if a person is clear about or sure of the preference it can be hypothesized that

they will come out the same type on the phrase questions as on the word-pair items when scored separately. It is reasonable to assume that persons with low preference scores, with x-half/y-half differences, and with phrase question/word-pair item discrepancies may, indeed, not be sure about what they trust and prefer. It may be hypothesized that this person has poor type development (especially if the preference in question is the person's Dominant function). If such a person is operating at a deficit due to poor type development, then we should be able to predict that in areas of functioning related to that preference, the person will show evidence of deficit there, too. For example, a student with the above described discrepancies on the MBTI for the S-N scale would be expected to show evidence of academic difficulties. (The S-N scale, since it deals with perception and how a person comes to "know" about something, is increasingly being found to be of great importance in learning situations.) Myers (1962) found lower internal consistency correlations in her academically underachieving samples.

Only one study dealing with the problem of discrepancies on MBTI profiles was found. Metts (1979) looked closely at discrepancies on MBTI profiles of 113 learning disabled adolescents. Because of the import of Metts findings for the present study it is reviewed in depth here.

Metts (1979) addressed the need to help learning disabled adolescents with problems related to self-knowledge

and self-identity in counseling situations. He pointed out that many researchers and practitioners agree that intervention with the personal development and self-identity processes of the learning disabled adolescents is as important as remediation of academic deficits. Jung's emphasis on awareness and maturation of one's type preferences is highly relevant here.

Metts reviewed contradictory research findings with respect to the importance of low self-esteem and low self-concept as contributing to the learning disabled adolescent's problems. Negative results (that low self concept was not a significant contributing factor) were obtained by Bruner and Starkey (1974), Busby, Fillmer, and Smittle (1974), Leviton and Kiraly (1975), and McDonnell (1975). Other studies, however, found significant positive relationships between self-concept and problems of L.D. students. Examples cited by Metts were Black (1974), Rosenthal (1973), and Rosser (1974). Metts concluded that the differing measurement devices employed to measure self-concept and differing definitions of self-concept are largely responsible for contradictory findings, and thus the noncomparability of the studies. Metts suggested, "In spite of these problems, the behavioral observations of Beare (1975), Giffin (1971), Gordon (1970), Gow (1974), Siegel (1975), Thompson (1970), and Wender (1971) suggest that the learning disabled adolescent continues to experience problems in self-identity" (pp. 12-13).

Metts' study has four important implications for education. First, use of the MBTI promises to meet a need of learning disabled students to gain self-knowledge. Secondly, an approach is offered where differences are valued rather than discouraged. Normal aspects of the student's personality are stressed. Jung's personality theory has implications for the education of the whole person, as Metts puts it--"balanced development of individuality" (p. 79). The third area is that of focusing on the social maturity of the learning disabled adolescent. The adolescent learns not only about himself and his own personality, but that of his peers--understanding how he may be like them and ways in which they may differ. Finally, Metts concluded that the MBTI can be used in studies to further explore personality variables in learning disabled students with the hope of understanding and discovering better ways of teaching them. Knowledge gained through employing the MBTI with students has then a two-fold potential. One is oriented toward personality development, the other toward academic achievement--better personal understanding as well as suggesting ways to enhance cognitive learnings.

Metts' basic research question was whether the distribution of the 16 profiles of learning disabled adolescents on the MBTI was the same as the distribution for normal adolescents. If they differed significantly one could question whether or not the learning disability had influenced type development in some way.

Metts' L.D. sample had a similar type distribution when compared with two normal samples. Only two differences existed. The most important of these was that the L.D. students more frequently expressed a preference for thinking judgments (T) in comparison with the two normal samples. In general there were more ISTP's and fewer ENFP's among the learning disabled group. Finding only two significant differences in the type distribution is not uncommon. If a sample of high school students is divided into those opting for college and those not, there would probably be more than two significant differences between the profiles of these two sub-groups.

Metts also looked very closely at discrepancies in profiles. Only eight of 113 subjects (7.01%) came out with the same type formula (the four letters used to designate type preferences) when x-y halves and word-pair/phrases on the MBTI were scored separately. Employing the three scoring methods (standard scoring, x-y halves, and word-pair/phrases) 22.12% of Metts' sample showed discrepancies on one MBTI scale, 36.28% on two MBTI scales, 25.66% on three scales, and 8.85% had discrepancies on all four scales. Metts employed alternative scoring in the hope of verifying type preference for subjects with low preference scores on one or more MBTI scales. The high percentage of discrepancies for his sample prevented this.

It is possible that the high percentage of discrepancies in Metts' sample and the questions raised about

predominance of thinking may both be understood within the framework of psychological type development. Metts gave two possible explanations for the prevalence of thinking judgment. One is that they may truely prefer thinking. The other is that it may result from educational procedures stressing clear, logical, objective thinking employed in the remediation of deficits. Metts further noted that students may have learned to distrust Feeling due to a lack of social, academic, and familial success. Since behavioral descriptions of L.D. students rarely connote traits associated with thinking judgment, Metts suggested further research to determine whether the choice of thinking is really the true preference.

The line of reasoning employed in the present study suggests that even though the behavioral descriptions of L.D. students do not frequently mention logical, analytical, impersonal methods of decision making, the students may still prefer thinking over feeling; however, they may not in reality have good command over its use. In other words, the large number of discrepancies may be related to the level of type development the student has reached.

Another consideration is the possibility that judgment (whether it be thinking or feeling oriented) may be the last process to develop. If this were true it is not unlikely that in any adolescent population, whether L.D. or not, the decision making process would be the function over which the person has the least command in its use, and hence, a greater

likelihood of discrepancies in reporting the preference. A common finding is that reliability of the T-F scale improves with age (McCaulley, 1978; Myers, 1962). Metts also found significantly more discrepancies for subjects who reported a preference for Feeling.

Metts' study clearly shows the researcher's dilemma in deciding whether to use profiles with low preference scores. He supports Myers' procedure for "mutual verification of results" (1962, p. 78). When low preference scores and multiple discrepancies exist, discussion of MBTI results with the person who took it is absolutely necessary from a counseling standpoint. In this case, the subject can often shed light on what "fits" and what does not. Metts reiterated Myers caution regarding interpreting very low preference scores--the smaller the score the more likely it is to be wrong.

It was outside the perspective of the present research to review studies where the direction of preference has been of central importance (direction of preference being whether the person prefers E or I, S or N, T or F, and J or P). This included studies where basic type differences between students was the independent variable. There was no intent to dismiss these studies lightly. Studies focusing on direction of preference were important in the past and will continue to gain in importance in the future.

It is interesting to note that in a study not dealing centrally with the matter of psychological type development

Hogan (1970) noted several things which in this researcher's opinion show probable evidence of the operation of differing levels of type development in his subjects. Hogan's study dealt with the subject of moral development. He investigated personality dimensions related to holding one or the other of two contrasting moral principles as the basis for making decisions in situations of "moral uncertainty." The "ethics of personal conscience" was contrasted with the "ethics of social responsibility." Hogan found the adherents of the "personal conscience" ideal (low scorers on the Survey of Ethical Attitudes, Hogan, 1967) to be -NFP's on the MBTI, and adherents of the "social responsibility" ideal (high scorers on the Survey of Ethical Attitudes) to be -STJ's on the MBTI (N = 57, $p < .01$ on all three scales of the MBTI). He points out that in an independent sample (N = 37), adherents of "personal conscience" (low scorers) were described on the Gough Adjective Check List (Gough, 1960; Gough & Heilbrun, 1965) as

rebellious	(-.49)	complicated	(-.42)	p = .05
handsome	(-.47)	cynical	(-.41)	
smug	(-.45)	sarcastic	(-.41)	
uninhibited	(-.44)	progressive	(-.41)	
charming	(-.44)	vindictive	(-.40)	

Those adhering to the "social responsibility" ideal (high scorers) were described as

thoughtful	(.47)	sincere	(.31)	p = .05
good-natured	(.43)	helpful	(.30)	
conventional	(.40)	responsible	(.29)	
conscientious	(.37)	planful	(.28)	
conservative	(.32)	honest	(.27)	

Hogan concludes that persons holding the "personal conscience" ideal,

> may be unconventional, liberal, and progressive; however, they may also be capricious, undependable, and anti-conforming. On the other hand, persons whose moral judgments are guided by rational and legal considerations [holding the "social responsibility" ideal] are often thoughtful, considerate and honest; yet, they may also be conventional and overconforming. . . . [they] tend to gravitate to positions where support of rules of conduct is viewed as positive behavior. Low scorers, on the other hand often seem to delight in changing the "system." Thus, both high and low scorers on the test possess unique virtues and drawbacks. (p. 211)

Hogan also comments that based on interviews, persons with scores below 5 or above 30 (extremely low and high scores) he considered to be highly sensitive to injustice--"sensitive to the point of paranoia." It is this writer's opinion that a large portion of the negative characteristics indirectly and potentially ascribed to -NFP's in Hogan's study could be explained if we could differentiate and treat separately the -NFP's who are mature and fully-developed (in psychological type terms) and likewise for the -STJ's. It is granted that the strengths of each of the psychological types differ and each has their characteristic "blindspots" and difficulties with which to deal, but this writer suspects that psychologically mature "examples of their type" (whichever of the sixteen types they may be) will exhibit their weaknesses and deficits in far less drastic ways than someone who is immature and less differentiated in a developmental sense.

An Assessment Problem

We have reached a roadblock in psychological type research. We know type differences do exist. We are only beginning to learn how important these differences are. What we do not know at this point is how to measure the extent to which a person has developed and has command over his preferences. Only then can we determine how much variance in observed differences between different types can be attributed to differences in the types themselves, and how much to differing levels of individual development within each type. Level of development is being assessed in a day-to-day clinical fashion based on theory. A data base is needed if we are ever to leave this intuitive stage. Case histories, anecdotal accounts, and successful experiences with clients or students where we have operated from a theory-base, while important, are not enough.

No studies, other than Metts (1979), either experimental or correlational in nature, were found in the published literature which dealt centrally with the topic of assessing an individual's level of psychological type development. While most investigators have recognized the developmental aspects of psychological type, research and application have been limited for the most part to exploration of differences between persons of various psychological types. The goal in most studies has been to determine how the direction of preference (i.e., whether the person prefers E or I, S or N, T or F, and J or P in Myers' system for

ascertaining type) relates to other variables, or to test predictions based on basic type differences (e.g., Sensing types will prefer a certain thing more than Intuitive types). These are legitimate goals, as it is necessary to determine empirically how psychological type manifests itself in interacting with other variables. Such investigations are, in fact, crucial in assessing construct validity of the MBTI. It is expected, however, that individuals will differ not only in the direction of basic preferences for the use of the psychological functions and attitudes, but that they will differ also in the command that they have over their preferred functions as well. In other words, it is expected that some individuals will have developed their preferred process or function to a greater extent than others preferring the use of the same function. The degree to which one has developed his preferred functions has implications for how well he functions in day-to-day situations which call upon powers of perception and powers of judgment. The perspective of the present study was at a more individual and micro-level than that of dealing with the basic type differences in direction of preference.

It has been proposed that persons giving inconsistent and discrepant responses on the MBTI scales may be functioning at a lower level of type development than persons giving clear and consistent responses. In order to measure

the effects of clear and consistent versus discrepant and inconsistent response against academic and nonacademic variables a Discrepancy Index was constructed. Discrepancy scores on each of the four MBTI scales were calculated for each subject in the present study. The Discrepancy Index is described in the section on Instrumentation in Chapter III.

CHAPTER III
DESIGN OF THE STUDY

This chapter describes subjects utilized in the study and explains administration procedures. Reliability and validity data for instruments employed in the study are given. The rationale and method of developing the Discrepancy Index are also presented. Hypotheses are restated and statistical methods for data analysis are explained.

Subjects

At the request of school officials a total of 1,171 tenth, eleventh and twelfth-grade students from a metropolitan high school participated in the project. Of this number, 555 students were subjects in the present study. For reasons explained in the next section, 70 of the 555 students were excluded from the study, leaving for the purposes of statistical analyses, 485 subjects. Table 1 gives a breakdown of subjects by grade level. Of this group 271 were females and 214 males. The 456 eleventh-graders whose data were analyzed represent 72% of the total eleventh-grade population of the school. The 29 tenth and twelfth-grade subjects were members of mixed-level English classes where eleventh-graders predominated.

The total school population was comprised of approximately 2,000 students. Socioeconomic level of the

Table 1. Subjects broken down by grade level.

Grade level	N
10th	15
11th	456
12th	14

Note: Total N = 485.

students covered an extremely wide range, with family incomes ranging from less than $4,000 per year to what has been termed the upper upper class. The school population included both inner city and rural dwellers.

The only selection factors known to have been operating in obtaining eleventh-grade subjects were the student's absence on the days instruments were administered, the student's choice not to participate, or the lack of informed parental consent. Students were guaranteed total anonymity in relation to the findings of this study.

Because the psychological type distribution of the sample may be of interest to researchers it is presented in standard "type table" format (as used at the Center for Applications of Psychological Type, Gainesville, FL) in Appendix C. The type distribution of students in the present study was compared statistically with that of Myers' sample of 9,320 Pennsylvania high school students. Results of this comparison are also reported in Appendix C.

Procedure

Approximately one week prior to the administration of the Myers-Briggs Type Indicator (MBTI), teachers distributed to their students letters explaining the nature of the research and informed parental consent forms. Teachers collected the consent forms prior to administration time. The MBTI was administered to students by their classroom English teachers during their standard 50 minute class period. Students who did not finish in the 50 minute period were allowed more time, as their schedules permitted, to complete their responses. The decision was made by the researcher to exclude from the study subjects who left blank 45 or more of the 166 items (N = 56). Another 14 subjects were excluded because no data, other than the MBTI, were obtained for them. For these reasons a total of 70 out of 555 were dropped from data analysis.

For the purposes of another study on response style bias operating in subjects taking the MBTI (Kainz, 1978), the standard Form F test booklet was given to 244 subjects from the present study. The remaining 241 students were given Form FR. Form FR had reversed response formats on 23 of the 166 items. Males and females sat on opposite sides of the classroom. Distribution of test booklets proceeded in a fashion so that every other student received a Form FR test booklet rather than a Form F booklet, thus, male and female students were provided an equal probability of being assigned to the Form F group and the Form FR group.

Students were unaware that two forms were distributed. Based on analyses of the results obtained from the alternate forms, it was found that students did not respond differently to the two forms (Kainz, 1978). In the present study the forms were considered equivalent.

In another 50 minute class period on the second day of administration, combined classes of students were asked under standardized directions from three test administrators, to complete a modified form of Landfield's Repertory Grid for assessing cognitive complexity. A major problem in this administration session was that a large number of students did not complete the procedure in the 50 minutes allotted. Analyses of these data will be performed at a later date and reported elsewhere.

Due to the impossibility of utilizing more of the students' daily class time, teachers agreed to assist the researcher by distributing and collecting from the students additional materials that students took home following the in-class testing. The materials in each take-home packet were general directions for completing the enclosed questionnaires, the moral judgment questionnaire, the ego development questionnaire with separate forms for males and females (responses to which will be analyzed and reported elsewhere), and a demographic data sheet.

While assessing the concurrent validity between two instruments or scales measuring comparable or related constructs is a legitimate way to assess the validity of any

new measure (the Discrepancy Index proposed here), it is advisable to search for behavioral or performance-related evidence where it is available and quantifiable. In the present study the following additional data were obtained: academic and overall grade point average; academic and overall class rank/standing. The school provided ethnic codes for the subjects from their census list. Concern for confidentiality plus time and financial constraints made the cost of accessing reading test scores for all subjects via the school system's computer prohibitive. English teachers' judgments of reading levels were obtained instead. Because the teacher judgments may or may not be reliable for all students, they will be analyzed as supplementary data only and results reported in Appendix A.

Instrumentation Employed in the Study

The Myers-Briggs Type Indicator

Description. The MBTI contains 166 forced-choice items and was designed to yield preference scores on four separate indices. The E-I index has two poles, extraversion and introversion. This index reflects whether the person prefers to focus perception or judgment upon the outer environment (E) or whether toward the inner world of one's own thoughts and ideas (I).

The S-N index has two poles, sensing perception and intuitive perception. This index reflects whether the person prefers to deal with the immediate reality as

revealed through the senses (S), or the world of possibilities revealed through the use of intuition (N).

The T-F index reflects what kind of judgment the person relies upon. One pole of the index is thinking (T) which is the preference for deciding based upon impersonal criteria and logic. The other pole is feeling (F) which is the preference for deciding based upon what is, from a subjective standpoint, valued in the situation. As described by Jung, thinking and feeling are both rational processes.

The J-P index was designed to reflect whether the person prefers the use of perception or the use of judgment as a way of dealing with the outside world (in other words, when the person is behaving in an extraverted way). According to Myers (1962), the difference here is "between the judging people who run their lives and the perceptive people who just live them" (p. 58). Perceptive types tend to want to perceive or find out more about something rather than to decide about it. Judging types tend to want matters decided.

Validity. Because the MBTI is a theory-based instrument, construct validity is of primary concern. With respect to validity, Kerlinger (1964) states, "Validity . . . is much more than technique. It bores into the essence of science itself. It also bores into philosophy. Construct validity, particularly, since it is concerned with the nature of 'reality' and the nature of the

properties being measured, is heavily philosophical" (p. 473). Fox (1969) defines construct validity as,

> The ability of the instrument to distinguish between groups known to behave differently on the variable or construct under study. . . . There are two sources for the construct or criterion on which the groups can be said to differ. One source is overtly relevant behavior. . . . A frequent parallel to this behavioral basis for construct validity is the development of the groups to be tested on the basis of indirectly related behavior. . . . construct validity is at best evidence that at a gross level the instrument measures what it seeks to measure. (pp. 372-373)

In a critical review of the MBTI for Buros 8th Mental Measurements Yearbook, Coan (1978) gave the following comments (concerning chiefly construct validity) about the complexities and problems in assessing the Jungian variables,

> The Myers-Briggs Type Indicator represents a major effort to capture the Jungian personality typology in a psychometric instrument. This is a formidable task. The Jungian typology rests on a sophisticated and intricate analysis of the basic modes of variation in human experience. . . . To assess fully an individual's type, we must identify his dominant attitude and his superior and auxiliary functions. For a number of reasons, this is a complicated problem. . . . The Type Indicator is the product of much thought and research, and its authors endeavored to take some of these problems into account. They have not fully solved them, but neither has any other test constructor. . . . Research has shown the instrument to be useful for many applications. . . . On the whole, the test clearly merits further research and use. (pp. 973-975)

McCaulley (1978), in a voluminous monograph on the application of the MBTI to Medicine and over twenty other health-related professions, provides further information on validity of the instrument. A four-page table (McCaulley, 1978, pp. 28-31) presents the correlations of MBTI

continuous scores on the four indices (E-I, S-N, T-F, and J-P) with scales from other personality instruments used with medical students. McCaulley (1978) explains,

> The table gives the direction of the significant correlations in type letters [E or I, S or N, T or F, and J or P] so that the reader can use the table not only to assess concurrent and construct validity, but also to gain a better understanding of qualities associated with each preference. (p. 27)

Correlations given are for the 16 Personality Factor Test, the Omnibus Personality Inventory, the Opinion, Attitude and Interest Survey, the Allport-Vernon-Lindzey Study of Values, and others.

With respect to predictive validity, the interested reader should refer to numerous articles cited in the extensive MBTI Bibliography (1981) which concern themselves with prediction. McCaulley (1978) adds, "The Myers Longitudinal Sample [McCaulley, 1977] is one of the major research efforts concerned with predictive validity of the MBTI, since the research question concerned the selection of specialties 12 or more years after taking the MBTI as freshmen in medical school" (p. 27).

The Manual (Myers, 1962)[2] is another rich source of data on validity of the MBTI. Chapter IV provides correlational data for the MBTI with (1) the Gray-Wheelwright

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[2] The original Manual was published in 1962 by Educational Testing Service. Revised manuals are due for publication by Consulting Psychologists Press in 1981. Plans exist for an administrative manual and a statistical manual.

Psychological Type Questionnaire (designed with the same purpose as the MBTI), (2) the Strong Vocational Interest Blank, (3) The Allport-Vernon-Lindzey Study of Values, (4) the Edwards Personal Preference Schedule, (5) the Personality Research Inventory, and finally, (6) non-test variables such as faculty ratings, turnover in utility jobs, and MacKinnon's data on creativity. Chapter V provides correlational data for the MBTI and scholastic performance and aptitude (such as SAT scores, Terman's Concept Mastery Test scores, grade point averages, IQ data, Davis reading test scores, and others). Hicks (1970) states, "The MBTI (Myers, 1962) represents perhaps the most satisfactorily validated, non-cognitive measure that falls into the forced choice category" (p. 200).

Reliability. Myers (1962) reports split-half reliability data for several groups (a measure of internal consistency). Myers utilized a logical split-half procedure and applied the Spearman-Brown Prophecy formula to obtain correlations between the X and Y halves of the MBTI. Split-half reliabilities range from .75 to .94. Myers notes that a wide range of age, intellectual ability, and socioeconomic status is included in these data. She points out that the only coefficients below .75 are for the underachieving eighth-grade male sample and the non-college preparatory twelfth-grade males. The coefficients for these two groups on the T-F scale are .44 and .60, respectively. The T-F scale fares lowest of the four scales in general,

but it should be noted that for the two college samples Myers reports, its "disadvantage" has disappeared (with coefficients of .83 and .86). McCaulley (1978, p. 33) supplies additional split-half and alpha measures.

Carlyn (1977) found MBTI test-retest reliabilities for the type classifications to be satisfactory. McCaulley (1978) provides test-retest data for both MBTI continuous scores and type categories (E-I, S-N, T-F, and J-P). Test-retest correlations (over periods of from 8 to 21 months) range from a low of .60 for the T-F scale to a high of .83 on the S-N scale. For two groups retested after a two month period, reliabilities ranged from .69 to .83. McCaulley points out that those people who change type upon retest usually do so on one or two letters, rarely on three letters, and almost never on all four letters. Of the seven samples presented, change on all four letters occurred only in one sample and then only 1% of the time. For a personality instrument the MBTI's test-retest reliabilities are quite respectable.

A final point with respect to reliability of the MBTI deserves discussion, as it bears centrally on the problem investigated in the present study. This is the issue of psychological type development. Myers' hypothesis as stated by McCaulley (1978) is that, "Samples assumed to have reached higher levels of type development will have higher internal consistency reliabilities (as reflected in split-half correlations provided by Myers). The T-F scale is

particularly likely to be low in underdeveloped samples" (p. 32). With respect to the T-F index reliabilities, Myers (1962) states, "The possibility would seem to exist that the relative uncertainty on TF may reflect a lesser development of the judging process, which may prove to be a significant characteristic of such samples" (p. 20).

Because the MBTI is a self-report instrument, we have the thorny question of how much variance is due to the reliability of the instrument, and how much is due to the reliability of the respondent. McCaulley (1978) addresses this point when she suggests that studies should be done in which test-retest reliabilities are computed separately for individuals originally clear in their preferences, and for those with initially low (indeterminate) scores. The problem as stated best by Myers (1962) boils down to the fact that at present,

> The potent but as yet unmeasurable variable of "type development"--i.e., the extent to which the person actually has developed the processes and the attitudes which he prefers--enters every equation as an unknown quantity. Also unknown is the mean level of type development for any of the various samples that are tested, and how many individuals in each should be expected to be answering virtually at random because their type is insufficiently developed to govern their responses. (p. 19)

The Discrepancy Index developed for the purposes of the present study and described later in the section on Instrumentation is an attempt at incorporating several clues as to the level of type development of the respondent

into a single index. The predictive power of the new index can then be assessed against outside criteria that are related to education and to psychological development in general.

The Moral Judgment Questionnaire

Description. The Moral Judgment Scale (MJS) was developed for the purpose of ascertaining levels of moral reasoning corresponding to those of Kohlberg (1958) in an objective-scoring format. According to Maitland and Goldman (1974) Kohlberg's interview procedures, "while comprehensive and well based on theoretical foundations, require great expenditures of time and careful administration" (p. 699). The administration and scoring format of the MJS was ideally suited for use in the present study.

The MJS consists of 15 vignettes, each followed by "a question aimed at evoking one particular issue of moral judgment and six alternatives representing characteristic modes of thought about the issue at each of the six stages of moral development" (Maitland & Goldman, 1974, p. 700). The order of presentation of the six stage-representative responses for each vignette was made random in the construction of the instrument.

Kohlberg (1958, 1963, 1964, 1969, 1971) defines the development of moral judgment as a dynamic process which proceeds as the child interacts with its social environment. Kohlberg's schema identifies six stages or levels of moral development. The first stage is the "punishment and

obedience" orientation. The second stage is termed "naive instrumental hedonism." In the next stage the primary focus is that of winning approval and maintaining good relations with others. The fourth stage involves a "law and order" orientation, where conformity serves to avoid censure by authority and the guilt that might accompany such censure. Level five is the morality of social contract. One obeys laws because they are the outcome of democratic process. The highest orientation in Kohlberg's system (level six) is that of reliance on "individual principles of conscience." Each successive stage of moral development in Kohlberg's conceptualization transmutes, restructures and displaces the preceding stage or level.

Validity. The authors pointed out two important differences between the MJS and Kohlberg's interview procedures. First, there is a loss of personal interaction with the MJS. In order to compensate for this, the authors personalized the vignettes by asking for judgments on situations where they themselves are involved (as opposed to judgments on behavior of a third party). Secondly, it is noted that subjects in Kohlberg's procedure provide or produce the response on their own, whereas in the MJS they choose from responses that have already been provided for them. Maitland and Goldman (1974) state, however, that "While the subject's decision to select a justification is a somewhat different task than that of Kohlberg's interview procedure, in which the subject supplies a decision and justifies it

through probing questions by the interviewer, this difference is seen as relatively minor" (p. 703). They point out that the matter of equivalence of selecting a justification with the spontaneous production of one, is an open question, and further stated that the direct computation of a validity coefficient was not possible from their data. Maitland and Goldman (1974) did find the mean scores on moral judgment for their subjects to be in accordance with Kohlberg's expectations for that age group (fifteen to seventeen-year olds). The authors compared MJS scores of their 36 subjects with Moral Maturity Scale scores of 25 of Kohlberg's subjects of similar age and academic preparation (Gilligan, Kohlberg, Lerner, & Belenky, 1971) by multiplying the MJS scores by a factor of 100/15. Kohlberg's mean Moral Maturity Scale score for this group was 364. The converted MJS score for Maitland and Goldman's subjects (from same age and academic grouping) was 365.

Wilmoth and McFarland (1977) made a comparison of four measures of moral reasoning. Contrary to Maitland and Goldman's findings, Wilmoth and McFarland did not conclude that the Objective Moral Judgment Scale validly assesses the Kohlberg stages, nor did they report it to have good reliabilities. They did find the Maturity of Moral Judgment Scale developed by Hogan (and reviewed in relation to MBTI findings in Section II, Chapter II) to be strongly related to subjects' classifications on the Kohlberg stages, but its continuous scores did not permit clear stage classification.

The goal of Wilmoth and McFarland's study was to use common age subjects to assess inter-instrument relationships, because the Objective MJS of Maitland and Goldman had been administered only to pre-college age students and Hogan's Maturity of Moral Judgment Scale to under-graduate age subjects. Wilmoth and McFarland used a sample of 70 adults enrolled in three extension graduate courses for educators. Over 80% of the subjects were elementary or secondary teachers, counselors, and/or administrators. Age ranged from 21 to 51 years with mean age being 30.45 years.

Only two dilemmas from Kohlberg's interview procedure and two from the Sexual Moral Judgment Scale (Gilligan, Kohlberg, Lerner, & Belenky, 1971) were utilized for the comparison. Subjects scores on the Objective MJS were not found to be significantly related to their scores on the four moral stories combined ($F = 1.82$, $df = 4/64$, $p < .15$). Utilizing Scheffé's post hoc comparison procedure, the authors found none of the means to be significantly different from one another (it is noted, however, that if the one-way analysis of variance was not significant, no significant post hoc comparison could be expected).

Wilmoth and McFarland concluded that their data offer little support for the Objective MJS as constructed by Maitland and Goldman. They report substantially lower internal reliabilities than those reported by Maitland and Goldman, and they ascribe the absence of relationship

between the Objective MJS and the four dilemmas used as the independent variable to the Objective MJS's lower reliability.

In spite of contradictory findings, the decision was made to employ the Objective MJS in the present study. This was due primarily to its objective format and secondly to the acceptable reliability and validity data obtained for subjects in the same age range as those in the present study. The hypothesis presented in the present investigation regarding moral reasoning is concerned foremost with predicting relative levels of moral judgment from analysis of discrepant responses and strength of preference for the Thinking-Feeling scale of the MBTI. The Objective MJS was seen as adequate for exploratory purposes.

Reliability. Maitland and Goldman (1974) assessed the test-retest reliability of the MJS by successive administration to 60 subjects at a ten-day interval. Subjects were public school students from seventh to twelfth grade (ages twelve to nineteen). The Pearson product-moment correlation for this group was .83. For a sample of 22 tenth and eleventh-graders it was .60. The authors concluded that scores were quite stable over a ten-day period.

Maitland and Goldman (1974) offer evidence that stage achievement can be reliably assessed by the MJS. They reasoned that "since stage achievement is somewhat independent of specific issue selections" (p. 700), item content differences might be expected to reduce internal

consistency reliability estimates. They obtained a corrected split-half reliability of .71. They computed a Kuder-Richardson Formula 20 reliability estimate (r = .67) in order to rule out particular order effects on the split-half reliability estimate obtained. In each case a sample of 125 subjects was employed. Subjects were evenly distributed by age from 12 to 23.

Over short periods (ten days) the MJS appears reliable. However, its reliability over longer intervals needs assessment.

Demographic and School Performance Data

Demographic. The subject's age was recorded on each MBTI answer sheet. Information as to grade level and race or ethnic origin was provided on computer-generated lists from the school. A questionnaire designed to obtain birth order information and an inferred estimate of socioeconomic status was returned by so few students that a range of socioeconomic level was all that could be provided by school personnel.

School performance. Academic and overall grade point average and class rank were obtained for each subject from a computer-generated list provided by the school. Reading test scores were available for so few students that English teachers were asked for estimates of their students' reading levels. Due to the questionable reliability of these estimates, they were utilized only in supplementary data analysis.

The Discrepancy Index

A Discrepancy Index (DI) based on individuals' responses on the MBTI was constructed for use in the present study. The complex computer-scoring program developed at the Center for Applications of Psychological Type (CAPT) provided the detailed scoring utilized in the DI. Four scores are rendered for each subject on the DI as follows: (1) a strength of preference score (DI1); (2) a word-pair/phrase item discrepancy score (DI2); (3) a split-half difference score (DI3); and (4) an overall discrepancy score (DI4).

Strength of preference scores (D1EI, D1SN, D1TF, and D1JP) were computed by giving a point value from one to four for each of four possible ranges of scores. Two sources of information were drawn upon in determining where to set score ranges for each of the four MBTI scales (E-I, S-N, T-F, and J-P). The first source comes from guidelines provided by Myers which the CAPT center utilizes in its extended scoring report. Table 2 presents these confidence regions in continuous score format.

Support for the confidence regions set by Myers was found in a paper presented by Morse (1975). Morse's goal was to provide "a measure of the likelihood that a preference as strong or stronger than a given score could have occurred by chance" (1975, p. 1). The distribution of random scores for the four MBTI scales is provided by Morse

Table 2. Confidence ranges for reported preferences.

Continuous score ranges: slight preference, may not be actual preference							
E	I	S	N	T	F	J	P
99 - 93	101 - 107	99 - 93	101 - 107	99 - 93	101 - 107	99 - 93	101 - 107
Continuous score ranges: moderate preference							
E	I	S	N	T	F	J	P
92 - 80	108 - 120	92 - 80	108 - 120	92 - 80	108 - 120	92 - 80	108 - 120
Continuous score ranges: clear preference							
E	I	S	N	T	F	J	P
79 -60	121 - 140	79 - 60	121 - 140	79 - 66	121 - 134	79 - 60	121 - 140
Continuous score ranges: very strong preference							
E	I	S	N	T	F	J	P
59 or less	141 or more	59 or less	141 or more	65 or less	135 or more	59 or less	141 or more

(Table 3). Continuous scores falling outside each range are significantly different from chance at the alpha level specified. While Morse provides the ranges for alpha levels from .50 to .001, only the .05 and .01 levels are reported here.

Table 3. Continuous score ranges differing significantly from chance.

MBTI scale	Alpha levels (2-tail) .05	.01
E - I	79 - 127	71 - 135
S - N	67 - 117	61 - 123
T - F (Males)	79 - 123	73 - 129
T - F (Females)	69 - 119	63 - 125
J - P	79 - 129	71 - 137

Note: Data from Morse, 1975, p. 8, Table 4.

The agreement between Myers' suggested ranges for confidence placed in reported preferences (Table 2) and Morse's confidence regions derived through statistical methodology (Table 3) is quite high. Because Myers' continuous score range for a clearly reported preference for each scale reaches or exceeds those reported by Morse as differing from chance at at least the .05 confidence level, they were utilized in the present study to designate strength of preference categories (slight, moderate, clearly reported, and

very strongly reported). A point value of 1 was assigned to the very strongly reported category, 2 to the clearly reported category, 3 to the moderately reported category, and 4 to the slightly reported preference category.

Word-pair/phrase item discrepancy scores (D2EI, D2SN, D2TF, and D2JP) were computed for each subject. If the subject did not change type (came out with the same preference on the word-pair items as on the phrase question items when scored separately) the zero difference was assigned a point value of 1. If the subject had a difference in continuous score of from 1 to 6 points, a 2 was assigned. A 3 was assigned if the difference in continuous score points ranged from 7 to 12. A 4 was assigned if the continuous score point difference was 13 or greater.

Split-half difference scores (D3EI, D3SN, D3TF, and D3JP) were computed by scoring the x-half and the y-half for each scale of the MBTI separately. If the absolute difference in continuous score points ranged from zero to 5, a point value of 1 was assigned (whether the subject changed type or not). A 2 was assigned for differences from 6 to 11, a 3 for differences from 12 to 17, and a 4 for differences of 18 or greater.

The fourth part of the Discrepancy Index was total scores combining discrepancies (D4EI, D4SN, D4TF, and D4JP) for each subject across each scale of the MBTI. Total scores were computed by combining the point values previously calculated for each MBTI scale as follows:

$$D4EI = D1EI + D2EI + D3EI$$
$$D4SN = D1SN + D2SN + D3SN$$
$$D4TF = D1TP + D2TF + D3TF$$
$$D4JP = D1JP + D2JP + D3JP$$

The fifth and final part of the Discrepancy Index was an additional set of combined scores (D1, D2, D3, and D4) where:

$$D1 = D1EI + D1SN + D1TF + D1JP$$
$$D2 = D2EI + D2SN + D2TF + D2JP$$
$$D3 = D3EI + D3SN + D3TF + D3JP$$
$$D4 = D1 + D2 + D3$$

D1 combines point values assigned for strength of reported preference across all four MBTI scales. D2 combines point values assigned for word-pair/phrase item discrepancies on all four MBTI scales. D3 combines point values assigned for split-half differences on all four MBTI scales. D4 combines the total points computed for strength of preference, word-pair/phrases, and split-halves on all four MBTI scales.

While beyond the exploratory scope of the present study, the Discrepancy Index is open to differential weighting of its component parts. Components which contribute little to variance may be redesigned by adjusting the ranges, and re-evaluated, or dropped altogether. Other components could be differentially weighted as merited.

Statement of Specific Hypotheses

H^1 Students with low Discrepancy Index scores will employ higher levels of moral reasoning than students with high Discrepancy Index scores.

To test this hypothesis the following discrepancy scores will be examined:

1.1 reported strength of preference for Thinking/Feeling scale
1.2 word-pair/phrase discrepancy on Thinking/Feeling scale
1.3 split-half difference on Thinking/Feeling scale
1.4 total and combined index scores (D4EI to D4JP and D1 to D4)

H^2 Students with low Discrepancy Index scores will have higher a) overall and academic class rank and b) higher overall and academic grade point average than students with high Discrepancy Index scores.

To test this hypothesis the following discrepancy scores will be examined:

2.1 reported strength of preference for E-I, S-N, T-F, and J-P scales
2.2 word-pair/phrase discrepancies
2.3 split-half differences
2.4 total and combined index scores

H^3 Students with low Discrepancy Index scores on the Thinking/Feeling scale when it represents their theorized Dominant function, will employ higher levels of moral reasoning than students with high Discrepancy Index scores on the Thinking/Feeling scale when it represents their theorized Dominant function.

To test this hypothesis the following index scores for students with either Thinking or Feeling as their theorized Dominant function, will be examined:

3.1 strength of reported preference for Thinking or Feeling
3.2 word-pair/phrase discrepancy on T or F
3.3 split-half differences on T or F
3.4 total and combined index scores

H^4 Students with low Discrepancy Index scores on the Sensing/Intuition scale when it represents their theorized

Dominant function will have a) higher overall and academic class rank or b) higher overall and academic grade point average than students with high Discrepancy Index scores on the Sensing/Intuition scale when it represents their theorized Dominant function.

To test this hypothesis, the following discrepancy scores for students with either Sensing or Intuition as their theorized Dominant function, will be examined:

4.1 strength of reported preference for Sensing or Intuition
4.2 word-pair/phrase discrepancy on S or N
4.3 split-half differences on S or N
4.4 total and combined index scores

Data Analysis

Scoring of MBTI optically-scanned answer sheets was accomplished via the computer program of the Center for Applications of Psychological Type with continuous scores, word-pair/phrase item scores, and split-half scores provided on standard 80 column computer cards. The Moral Judgment Scale was hand-scored by the researcher. Demographic data, school performance data, and MJS scores were recorded on computer cards. The 20 Discrepancy Index scores for each subject were computed and coded using Version 7.1 of the Statististical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner & Bent, 1975).

Statistical procedures were performed at the Northeast Regional Data Center of the University of Florida using Version 7.1 of the Statistical Package for the Social Sciences (SPSS). SPSS subprograms utilized were Frequencies,

Pearson Correlations, and Breakdowns providing one-way analysis of variance and linear trend tests. In the preliminary stages of analysis subprograms Scattergram and Factor Analysis were also used. Post hoc tests for subgroups where the overall F tests were significant at at least the .05 level were performed by hand employing Scheffé's S test procedure. The Selection Ratio Type Table program (Allen & Kainz, 1976) was utilized to obtain chi-square statistics for psychological type distributions and for comparison purposes between the sample employed in the present study and that of 9,320 Pennsylvania high school students (Myers, 1962). Type distribution data are reported and discussed in Appendix C.

The independent variables consisted of the 20 Discrepancy Index scores computed for each individual. There were seven dependent variables; overall class rank, academic class rank, overall grade point average, academic grade point average, Moral Judgment Scale total score, Moral Judgment Scale mean score, and teacher estimates of student reading level. Both grade point average and class rank were utilized as criterion variables even though they are nearly perfectly correlated (one derived from the other), because class rank reflects the student's academic performance in relation to that of classmates and to that extent provides descriptive information not readily ascertained from grade point average. Teacher estimates of reading level were analyzed and reported as supplementary data only

(Appendix A). Ordinal level measures were obtained for all variables in the study and they were treated as though they were interval level in data analysis. According to Labovitz (1970) interval statistics can be applied to ordinal-level variables, especially when the nature of the research is exploratory.

CHAPTER IV
RESULTS

This chapter provides the results from one-way analysis of variance and other data analysis procedures, including post hoc comparisons. Significant findings for the four hypotheses are presented.

One-way Analysis of Variance

One-way analysis of variance (ANOVA) was performed for the six criterion variables utilizing version 7.1 of the Statistical Package for the Social Sciences (SPSS, Nie, Hull, Jenkins, Steinbrenner & Bent, 1975). Significant results are reported in Tables 4 through 7. Supplementary analysis of teacher estimates of reading level are reported in Appendix A. In spite of the exploratory nature of the study, only those differences reaching the .05 level of significance are reported in Tables 4 through 7 and the Appendices.

The two basic assumptions for legitimate use of ANOVA were met--the assumptions of normality and homogeneity of variance. With respect to normality the question of importance was, do the criterion variables under study have a normal or near-normal distribution, and examination of means, medians, and values for skewness and kurtosis revealed that they do. In addition, measurement in the

present study reached at least the ordinal level. Labovitz (1970) argues that interval statistics (parametric) can be applied to ordinal-level variables, and that error associated with such treatment is offset by the use of better developed, more sensitive, and more clearly interpretable statistics.

The assumption of homogeneity of variance was tested. The F-test for homogeneity of variance (Kohout, 1974) was employed for this purpose. In 240 possible comparisons of sample variances only two reached significance at the .01 level and three at the .001 level (these comparisons were between groups 1 and 2, and 1 and 3 for D1TF with overall grade point average, and between groups 1 and 2, 1 and 3, and 1 and 4 for D1TF with academic grade point average). In three of the five cases the obtained value for F just barely exceeded the F table value. For example, with degrees of freedom 40,172 the obtained F value was 1.58 where the table value for F was 1.56. In 235 comparisons sample variances did not significantly differ. In general then, sample variances did not differ widely enough to warrant assuming inequality.

Tests of linearity (linear trend tests) were performed to determine whether the relationship between the dependent and independent variables was solely a linear relationship (Nie, Hull, Jenkins, Steinbrenner & Bent, 1975). Linear and non-linear components of variance explained are given in Tables 4 through 7.

Post Hoc Comparisons

Considering the exploratory nature of the study a liberal test for the *post hoc* comparisons would have been desirable. Two such tests were considered. Unfortunately, Tukey's method of multiple pairwise contrasts could not be used because it requires equal sample sizes (Marascuilo, 1971). Duncan's method was not chosen because according to McNemar (1969), "The frequently advocated Duncan 'new multiple range test' is currently under suspicion by mathematical statisticians" (p. 324). Because of its general acceptance and wide use (albeit extremely conservative) Scheffé's *S* test was selected and utilized in two formats. In a fashion consistent with the direction of the hypotheses posed, all possible pairwise comparisons of group means were made. In addition, non-pairwise contrasts (combining groups 1 and 2 for comparison with groups 3 and 4) were performed. These post hoc analyses were made only where the overall *F* for the one-way ANOVA reached the .05 level of significance. Only those post hoc comparisons reaching the .05 significance level are reported in Tables 4 through 7 and Appendix A.

Selection Ratio Type Table Analyses

The frequency distribution of the type preferences themselves must be closely scrutinized before the analysis of variance results are interpreted. For each of the four groups of each discrepancy index the selection ratio type table program, SRTT (Allen & Kainz, 1976) was utilized to locate any significant differences in type distribution.

As these analyses were not part of the primary focus of the present study, they are reported and discussed in Appendix D.

Frequencies

Metts (1979), in working with learning disabled students, raised the question as to how many discrepancies on MBTI scales can be expected to exist in normal samples. Descriptive statistics for the Discrepancy Indices in the present study are found in Appendix B. For all 20 Discrepancy Index groups, the mean for each index as well as the N and percent of sample for each of the four groups within each index is presented.

Results of Hypotheses Testing

Hypothesis 1.1 was supported (see Table 4). Students who reported higher preferences for either Thinking or Feeling had significantly higher Moral Judgment Scale total and mean scores than students who reported low preferences for Thinking or Feeling. Hypotheses 1.2 and 1.3 regarding word-pair/phrase discrepancy and x-y half differences were not supported.

Hypothesis 1.4 received some support. The relationship between D4TF and MJS score was not significant at the .05 confidence level; however, means were in the exact order predicted, with students with high preferences for T or F, no word-pair/phrase discrepancy, and low x-y half differences having highest MJS scores. With respect to $H^{1.4}$ (dealing with total or combined index scores) there was

Table 4. Significant findings for H^1.

Hypothesis	N	overall F (df)	p	r^{2*}	$eta^2 - r^{2*}$	eta^{2*}	significant pairwise contrasts (Scheffé's S)	S (p)	significant non-pairwise contrasts	S (p)
$H^{1.1}$ D1TF with MJS total	115	3.71 (3,111)	.01	.088	.003	.091	gp 2 > gp 4	5.58 (.05)	gp 1&2 > 3&4	4.55 (.05)
D1TF with MJS $\bar{x}$	115	3.71 (3,111)	.01	.088	.003	.091	gp 2 > gp 4	.376 (.05)	gp 1&2 > 3&4	.303 (.05)
$H^{1.4}$ D4JP with MJS total	115	4.06 (3,111)	.01	.001	.098	.099	gp 3 > gp 2	-5.76 (.05)	none	
D4JP with MJS $\bar{x}$	115	4.06 (3,111)	.01	.001	.098	.099	gp 3 > gp 2	-.384 (.05)	none	

*r^2 = proportion of linear variance explained.

$eta^2 - r^2$ = proportion of non-linear variance explained.

eta^2 = total variance explained.

a significant relationship between D4JP and MJS score. The relationship appears non-linear. Group 3 had significantly higher MJS scores than did group 2. For J-P then, the students expressing only moderate preference for J or P, with slight word-pair/phrase discrepancy, and moderate split-half difference, had the highest scores on the MJS.

Hypothesis 2.1 received support. Students who reported the highest preferences for either Extraversion or Introversion (on D1EI) had significantly higher overall class rank and overall grade point average than students expressing lower preferences for E or I. The same trend existed for academic class rank and academic grade point average, but results did not reach the .05 level of significance.

Students who reported the highest preferences for either Sensing or Intuition (on D1SN) had significantly higher academic class rank and academic grade point average than students reporting lower preferences for Sensing or Intuition. The same trend existed for overall class rank and overall grade point average, but results were not significant at the .05 level.

Students expressing the highest preferences for either Thinking or Feeling (on D1TF) had significantly higher overall and academic class rank and overall and academic grade point averages than students expressing only moderate or slight preferences for T or F.

Another significant non-linear relationship appeared for the J-P scale as it did in $H^{1.4}$ (see D1JP on Table 5).

Table 5. Significant findings for $H^{2.1}$.

Hypothesis	N	overall F (df)	p	r^{2*}	eta^2-r^{2*}	eta^{2*}	significant pairwise contrasts (Scheffé's S)	S (p)	significant non-pairwise contrasts	S (p)
D1EI & overall class rank	482	3.22 (3,478)	.02	.002	.018	.02	none		none	
D1EI & overall g.p.a.	478	2.75 (3,474)	.04	.002	.016	.017	none		none	
D1SN & acad. class rank	482	3.19 (3,478)	.02	.002	.018	.02	none		none	
D1SN & acad. g.p.a.	478	3.25 (3,474)	.02	.002	.018	.02	none		none	
D1TF & overall class rank	482	7.14 (3,478)	.0001	.039	.004	.043	gp 1 > gp 3 gp 1 > gp 4 gp 2 > gp 4	85.33 (.05) 126.5 (.001) 59.96 (.05)	gp 1&2 > 3&4	75.28 (.001)
D1TF & acad. class rank	482	4.75 (3,478)	.003	.023	.006	.029	gp 1 > gp 4	106.1 (.01)	gp 1&2 > 3&4	52.33 (.05)
D1TF & overall g.p.a.	478	6.04 (3,474)	.0005	.033	.004	.037	gp 1 > gp 4	.463 (.001)	gp 1&2 > 3&4	.2303 (.01)
D1TF & acad. g.p.a.	478	4.45 (3,474)	.004	.022	.006	.027	gp 1 > gp 4	.447 (.01)	gp 1&2 > 3&4	.221 (.05)
D1JP & overall class rank	482	3.16 (3,478)	.02	.003	.016	.02	gp 3 > gp 4	59.43 (.05)	none	
D1JP & overall g.p.a.	478	3.26 (3,474)	.02	.004	.016	.02	gp 3 > gp 4	.217 (.05)	none	
D1JP & acad. g.p.a.	478	2.68 (3,474)	.05	.003	.014	.017	none		none	

Students who reported only a moderate preference for either the judging or perceptive attitude had significantly higher overall class rank and overall grade point average than students reporting higher and lower preferences for J or P.

Hypothesis 2.2 was only partially supported (see D2JP, Table 6). No significant relationships emerged for word-pair/phrase discrepancies with academic variables for the E-I, S-N, or T-F scales of the MBTI. A significant relationship existed for the J-P scale. In the post hoc comparisons, group 4 (students with the largest word-pair/phrase discrepancy for J or P) came out highest on all four academic variables. In 3 of 4 post hoc comparisons, group 1 (students with no word-pair/phrase discrepancy on J or P) were second highest on academic variables. The relationship thus appears curvilinear with students highest and lowest in word-pair/phrase discrepancies on J-P faring best on academic variables.

Hypothesis 2.3 was not supported. No significant relationships emerged between x-y half differences and academic variables.

Hypothesis 2.4 dealt with total discrepancy scores (D4EI to D4JP) which combines strength of preference, word-pair/phrase discrepancies, and x-y half differences for E-I, S-N, T-F, and J-P, and combined discrepancy scores (D1 to D4) where D1 combines strength of reported preference for all four MBTI scales, D2 combines word-pair/phrase

Table 6. Significant findings for $H^{2.2}$ and $H^{2.4}$.

Hypothesis	N	overall F (df)	p	r^{2*}	eta^2-r^{2*}	eta^{2*}	significant pairwise contrasts (Scheffé's S)	S (p)	significant non-pairwise contrasts	S (p)
$H^{2.2}$										
D2JP & overall class rank	482	5.99 (3,478)	.001	.0114	.025	.0363	gp 4 > gp 2	132.7 (.01)	none	
D2JP & acad. class rank	482	4.81 (3,478)	.003	.015	.015	.0293	gp 4 > gp 1 gp 4 > gp 2	52.91 (.05) 110.07 (.05)	none	
D2JP & overall g.p.a.	478	5.51 (3,474)	.001	.012	.022	.034	gp 4 > gp 2	.484 (.01)	none	
D2JP & acad. g.p.a.	478	4.70 (3,474)	.003	.013	.016	.029	gp 4 > gp 2	.463 (.05)	none	
$H^{2.4}$										
D4SN & acad. class rank	482	4.07 (3,478)	.007	.012	.014	.025	gp 1 > gp 2 gp 1 > gp 3	70.04 (.05) 69.81 (.05)	none	
D4SN & overall g.p.a.	478	2.59 (3,474)	.05	.006	.01	.016	none		none	
D4SN & acad. g.p.a.	478	4.60 (3,474)	.004	.01	.018	.028	gp 1 > gp 2 gp 1 > gp 3	.294 (.05) .353 (.01)	none	
D4TF & overall class rank	482	3.16 (3,478)	.02	.018	.002	.019	none		gp 1&2 > 3&4	51.66 (.05)
D1 & overall class rank	482	3.53 (3,478)	.01	.02	.004	.022	gp 1 > gp 3 gp 1 > gp 4	79.55 (.05) 95.63 (.05)	gp 1&2 > 3&4	54.36 (.05)
D1 & overall g.p.a.	478	2.98 (3,474)	.03	.02	.002	.02	none		gp 1&2 > 3&4	.199 (.05)

discrepancies for all four MBTI scales, D3 combines split-half differences on all four MBTI scales, and D4 combines total points computed for strength of preference, word-pair/phrase discrepancies, and split-half differences on all four MBTI scales. Significant relationships, in the direction predicted, did exist for the total Discrepancy Index for Sensing or Intuition (D4SN) and academic class rank, overall grade point average, and academic grade point average. Students with strongly reported preference, low word-pair/phrase discrepancy, and low x-y half differences for S or N were higher on these academic variables than students reporting lower preferences, higher word-pair/phrase discrepancy, and higher x-y half differences for S or N. A single relationship existed for the total Discrepancy Index for T or F (D4TF) where students with high preference, low word-pair/phrase discrepancy, and low x-y half difference for Thinking or Feeling had significantly higher overall class rank than students with low preference, high word-pair/phrase discrepancy, and high x-y half difference for T or F. A significant relationship did not emerge between the total Discrepancy Index for J or P (D4JP) and the academic variables.

A significant relationship existed for the combined Discrepancy Index for strength of preference on all four MBTI scales (D1) and academic variables. Students with highest reported preference for E or I, S or N, T or F, and J or P had significantly higher overall class rank and

overall grade point average than students with only moderate or slightly reported preferences. No significant relationships emerged for D2, D3, or D4 and academic variables.

H^3 was not supported.

Hypothesis 4.1 received partial support. For students with either Sensing or Intuition as their theorized dominant function, those with strongly reported preference for S or N (group 1 on D1SN) had higher academic class rank and higher academic grade point averages than those reporting lower preference for S or N. Neither word-pair/phrase discrepancy ($H^{4.2}$) nor x-y half difference ($H^{4.3}$) on S or N for those students with S or N as their theorized dominant function, was significantly related to academic variables.

Hypothesis 4.4 was supported. The total index for S or N (D4SN, where S or N was the theorized dominant function) did significantly predict to the academic variables in the direction expected. Students with S or N dominant who had strongly reported preference, low word-pair/phrase discrepancy, and low x-y half differences on S or N had significantly higher overall class rank, academic class rank, overall grade point average, and academic grade point average than students with lower preference, higher word-pair/phrase discrepancy, and higher x-y half differences on S or N.

Table 7. Significant findings for H^4.

Hypothesis (where S or N dominant)	N	overall F (df)	p	r^{2*}	$eta^2 - r^{2*}$	eta^{2*}	significant pairwise contrasts (Scheffé's S)	S (p)	Significant non-pairwise contrasts	S (p)
$H^{4.1}$										
D1SN & acad. class rank	243	3.46 (3,239)	.02	.002	.0401	.042	none		none	
D1SN & acad. g.p.a.	240	3.43 (3,236)	.02	.004	.038	.042	none		none	
$H^{4.4}$										
D4SN & overall class rank	243	4.01 (3,239)	.01	.009	.0387	.048	gp 1 > gp 2 gp 1 > gp 3	103.7 (.05) 103.1 (.05)	none	
D4SN & acad. class rank	243	5.8 (3,239)	.001	.011	.057	.068	gp 1 > gp 2 gp 1 > gp 3	125.7 (.01) 125.0 (.01)	none	
D4SN & overall g.p.a.	240	4.8 (3,236)	.003	.009	.049	.058	gp 1 > gp 2 gp 1 > gp 3	.374 (.05) .451 (.01)	none	
D4SN & acad. g.p.a.	240	6.95 (3,236)	.0002	.013	.068	.081	gp 1 > gp 2 gp 1 > gp 3	.526 (.01) .624 (.001)	none	

CHAPTER V
DISCUSSION AND CONCLUSIONS

In the first part of this chapter the results presented in Chapter IV (Tables 4 through 7) are discussed and summarized in relation to the hypotheses tested. Next, implications for education are discussed. Finally, suggestions for further research are given.

Discussion of Results

Hypothesis 1, that students with low Discrepancy Index scores will employ higher levels of moral reasoning than students with high Discrepancy Index scores, received support. The Discrepancy Index dealing with strength of reported preference for either Thinking or Feeling (D1TF) did significantly discriminate between students expressing high and low levels of moral reasoning on the MJS. As predicted, students who expressed the strongest preferences for T or F employed higher levels of moral reasoning than students expressing only moderate or slight preferences for T or F. In terms of Jungian psychological type theory this suggests then that students who have developed their judging function, regardless of whether they prefer to make thinking judgments or feeling judgments, tend to make decisions which can be categorized as employing higher levels of reasoning than students who have a lesser-developed judging function.

The Discrepancy Indices dealing with word-pair/phrase discrepancy (D2TF) and split-half differences (D3TF) did not significantly predict the level of moral reasoning employed. For D2TF, students in group 1 (those who indicated the same type preference on the word-pair items as on the phrase questions) did have the highest total and mean MJS scores; however, the results were not statistically significant. A problem with the word-pair/phrase index is that, as it was constructed in the present study, the number of students falling in each of the four groups was highly disproportionate. For example, for D2TF and MJS score, 84 of the 115 students completing the MJS did not have a type discrepancy on word-pair/phrases. Only 4 students had discrepancies of from 1 to 6 points, 8 students had discrepancies of from 7 to 12 points, and 19 students had discrepancies of 13 points or greater. This index needs refinement and re-evaluation before it can be concluded that word-pair/phrase discrepancy per se does or does not discriminate between students at differing levels of psychological type development.

For D3TF, dealing with split-half differences, disproportionate numbers of students across the four groups did not appear to be a problem. As constructed here, no significant relationships emerged for split-half difference.

A significant relationship emerged for D4JP (total index for reported strength of preference, word-pair/phrase discrepancy, and split-half difference for the J-P scale of the MBTI) and MJS score. The relationship appears

non-linear, with students expressing only moderate preference for J or P, with slight word-pair/phrase discrepancy, and moderate split-half difference having highest scores on the MJS. It appears that students expressing very high or very low preference for J or P may not fare as well as those expressing more moderate preference for the judging or perceptive attitude. Personality factors such as tendency to overcontrol or failure to control, to over-organize or under-organize one's affairs may be involved as well as factors such as dogmatism. A person with an extreme judging attitude may not be open to change or grant consideration to incoming perceptions. Myers has commented that they may "slam the door" on perception too soon. In opposite fashion, the person with an extreme perceptive attitude may fail to make important decisions or meet deadlines by wanting to keep on perceiving and taking in new information indefinitely. Myers likened this to "refusing to shut the door" and hesitating to act on what is already known. The data here do indicate that a balanced or moderate degree of development or usage of either the judging or perceptive attitude may prove more adaptive.

Hypothesis 2, that students with low Discrepancy Index scores will have 1) higher overall and academic class rank and 2) higher overall and academic grade point average than students with high Discrepancy Index scores, was supported. Results were in the direction predicted for reported strength of preference for E-I, S-N, and T-F. In terms of

Jungian theory this suggests that students who have a well developed orientation (either Extraversion or Introversion), a well developed perceptive function (either Sensing or Intuition), and a well developed judging function (either Thinking or Feeling) are more likely to be higher achievers in the traditional school environment than students with lesser developed functions and orientation.

A significant relationship emerged for strength of preference for J or P (D1JP) and academic variables. Students with moderate preference for J or P had higher overall class rank and grade point average than students with highest and lowest preference for J or P.

As with the previous hypothesis, word-pair/phrase discrepancy predicted very little. The only significant relationship between word-pair/phrase discrepancy and academic variables was for the J-P scale of the MBTI (D2JP), with the relationship non-linear as before. The students with the highest and lowest word-pair/phrase discrepancies on J-P fared best academically. Further research regarding personality factors associated with extreme scores on J-P may shed more light on this finding.

No significant relationships between split-half differences and the academic variables emerged. As constructed here, the split-half index did not predict academic standings.

Significant relationships in the direction predicted existed for the total Discrepancy Indices for the

Sensing/Intuition scale of the MBTI and for the Thinking/Feeling scale (D4SN and D4TF). As predicted, students with strongly reported preference, low word-pair/phrase discrepancy, and low split-half difference fared better on the academic variables than students reporting lower preference, higher word-pair/phrase discrepancy, and higher split-half difference for Sensing or Intuition and for Thinking or Feeling. That these significant relationships emerged is important in terms of Jungian psychological type theory. They are believed related to the developmental framework upon which type theory rests. This development involves the gradual growth and continued strengthening and evolving of the four psychological functions (Sensing, Intuition, Thinking, and Feeling). In terms of the theory, it has been hypothesized that persons who have a well-developed perceptive function with which to perceive (either Sensing or Intuition) would fare better in real life situations and particularly in academic settings than someone with a lesser developed perceptive function. Likewise, a person with a mature, well-developed judging function (either Thinking or Feeling) would be expected to make more effective decisions, a factor that might contribute to academic success. The achievement data obtained here clearly lend credence to this aspect of the theory.

Significant relationships existed for the combined Discrepancy Index for strength of preference on all four MBTI scales (D1) and the academic variables in the direction

expected. Students expressing the highest reported preferences for E or I, S or N, T or F, and J or P had significantly higher overall class rank and grade point average than students expressing only moderate or slight preferences. Since D1 is a combined index for D1EI, D1SN, D1TF, and D1JP it adds little new information. (The degree of relationship between the variables would probably be higher if D1JP were removed, since unlike D1EI, D1SN, and D1TF, it appears to be a non-linear relationship.) This significant finding for D1 does, however, add validity to the significant relationships already discussed regarding the theoretical value of holding clear, consistent preferences. If the significant relationships for D1 had not emerged, the foregoing interpretations would certainly appear less valid.

Hypothesis 3, that students with low Discrepancy Index scores on the Thinking/Feeling scale when it represents their theorized Dominant function, will employ higher levels of moral reasoning than students with high Discrepancy Index scores on the Thinking/Feeling scale when it represents their theorized Dominant function, was not supported. Of the 115 students who completed the MJS, 57 of them had Thinking or Feeling as their theorized Dominant function. For these students none of the Discrepancy Indices significantly predicted MJS total or mean scores. Two trends in the direction predicted were present. For strength of reported preference (D1TF) where T or F was the theorized

Dominant function, all four group means were in the exact order expected with group 1 (strongest reported preference for T or F) scoring highest and group 4 (slightly reported preference for T or F) scoring lowest. For D4TF with T or F dominant, groups 1 and 2 were in first and second place for highest MJS scores. The differences, however, did not reach the .05 level of significance.

Two points deserve discussion here. Since the group means were in the direction predicted, the hypothesis warrants further investigation with a larger sample and with more sensitive criterion variables. An ideal test of prediction would be to take individual judgments or decisions in a particular setting that had been judged by some clearly specified external criteria to be effective or ineffective to varying degrees and then see if the Discrepancy Index yields accurate predictions. Another test would be to actually employ Kohlberg's system for assessing levels of moral reasoning. Both of these would be time-consuming but warranted.

Secondly, the aspect of Jung's theory dealing with the Dominant and the Auxiliary function is more complex and more controversial among Jungian analysts and other clinical professionals than other aspects of the theory. There is some difference of opinion among experts as to how to best determine the Dominant and Auxiliary functions for a given individual. The system employed by Myers was utilized in the present study.

Hypothesis 4, that students with low Discrepancy Index scores on the Sensing/Intuition scale when it represents their theorized Dominant function will have higher overall and academic class rank and higher overall and academic grade point average than students with high Discrepancy Index scores on the Sensing/Intuition scale when it represents their theorized Dominant function, received partial support. Significant relationships in the direction predicted emerged between strength of reported preference for S or N (D1SN) and academic class rank and grade point average (where academic class rank was known for 243 students holding S of N as their theorized Dominant function and academic grade point average was known for 240 students with S or N as their theorized Dominant function).

The total Discrepancy Index for S or N (D4SN, for subjects with S or N as their theorized Dominant function) significantly predicted to all four academic variables. Students with S or N as their Dominant function who had strongly reported preference, low word-pair/phrase discrepancy, and low split-half difference for S or N had higher overall and academic class rank and higher overall and academic grade point average than students expressing lower preferences, higher word-pair/phrase discrepancy, and higher split-half difference on S or N.

These findings for hypothesis 4 tend to support those already obtained for hypothesis 2 with respect to the apparent value of holding strong, clear preferences for

Sensing or Intuition (the perceptive functions) in relation to performance on academic variables. They take the analysis one step further, however, to look at differences between students for whom Sensing or Intuition should theoretically be their Dominant or most developed function. The Discrepancy Index did discriminate at that level as well.

Summary

Strong support for the hypotheses regarding the value of holding strong type preferences was found (D1EI, D1SN, and D1TF). The total Discrepancy Index scores combining strength of preference, word-pair/phrase discrepancy, and split-half difference (D4EI to D4TF) and the combined index for strength of preference on all four MBTI scales (D1) also had predictive validity. These relationships appear to reflect actual "within type" differences. In other words, it was shown that students with high preference for their perceptive function, whether it be for Sensing or for Intuition, fared significantly better on academic variables than students expressing low preferences. The same relationship existed for level of moral reasoning and strength of preference for their judging function. Students with strong preferences for either Thinking or Feeling attained higher scores on the MJS than students with low preferences for Thinking or Feeling. Several non-linear relationships emerged for the Discrepancy Indices when applied to the J-P scale of the MBTI.

Implications for Education

The purpose of the present study was to explore the validity of an index developed to assess "within type" differences. The DI was created in the hope that it could differentiate between students high in type development and those less well developed. It was believed, since so many students are taking the MBTI for numerous reasons, that information regarding strength of preference, word-pair/phrase discrepancy, and split-half difference could be used in a diagnostic and possibly preventive way to identify potentially "high risk" learners. Based on the present study, it appears that strength of preference (D1EI, D1SN, and D1TF), the total indices (D4EI, D4SN, and D4TF), and the combined index (D1) may give clues as to level of type development.

The information provided by the MBTI, or simply knowledge of type concepts, can be utilized in many ways in the classroom to the benefit of students, teachers and administrators without making reference at all to the indices investigated here or without reference to the concept of type development. However, since strong preference appears to be positively correlated with academic achievement and level of moral reasoning, this is information that guidance counselors, school psychologists, evaluators, and teachers can use in helping students develop their powers of perception and judgment, making real the hope expressed so well by Myers--to head off problems before they progress too far.

As stated in an earlier chapter, the MBTI is being increasingly utilized in all types of educational settings. Guttinger (Guttinger, 1974; Guttinger & Hines 1977) has used it in an individualized reading program that has been adopted in numerous school settings across Florida, and on a trial basis in Brazil. Rowe (1978) utilized psychological type concepts in her work with science teachers as a means for creating awareness that there are aspects of science that appeal to all types of people. Knowledge of psychological type can also suggest to teachers the best individual way to teach science to a particular student, or how to at least interest that student in science.

The important point to bear in mind here is that in the current uses of psychological type in educational settings we have been dealing with type differences primarily between students. The area where we have needed more knowledge is the difference between students holding the same preferences at differing levels of development. This is the question of type development. As Jung proposed it, psychological type is not a static state, but rather a developmental process. Anecdotal evidence regarding the developmental nature of psychological type has been presented, but data obtained from empirical study were not found in the literature. As the MBTI and Jung's concepts become even more widely used, the need to explain "within type" differences has become increasingly important. Many who employ Jung's developmental concepts in applied settings have been finding clues

in the scores yielded by detailed scoring of the MBTI as to the level of type development of the respondent. Attempting to ascertain the validity of these clues was the topic of the present study. Dealing with type concepts on two levels (basic preferences as well as degree of development) appears justified and worthy of further study.

Lawrence (1979) and others have pointed out advantages of employing psychological type concepts in the teaching-learning process. In the area of learning styles, psychological type concepts are being taken into account. Even more studies are needed to increase our understanding of how different type concepts would provide experiences and activities that would encompass the smorgaasbord approach where there was "something for everybody" and where none of the type preferences were underrated or made to seem less important. A second dimension of such a teaching approach would be in providing instruction which would help students develop their preferred way of perceiving and judging more fully.

Metts (1979) addressed the problem of interpreting discrepant and inconsistent responding on the MBTI in a learning disabled population. Only eight of 113 subjects came out with the same type formula when x-y halves and word-pair/phrases were scored separately. He further pointed out the following advantages of using type concepts

with learning disabled students: dealing with the basic type preferences addresses a need of learning disabled students to gain self-knowledge; secondly, the approach is one where differences are valued rather than discouraged; such an approach may enhance social maturity when the L.D. student comes to understand ways in which he is like his peers and understands and accepts the ways he is different; and finally, in further exploring personality variables in L.D. students we may discover better ways of teaching them (a goal which applies as well to learners who are experiencing no apparent learning disability).

Another place in special education where being able to ascertain the level of type development of the student would be beneficial is in the writing of the individualized educational plans required by Public Law 94-142. Again there are two dimensions regarding psychological type--one, what are the basic preferences. When we have an idea of the student's basic preferences we have clues as to what might be interesting, motivating, and rewarding to that student. Secondly and in relation to type development, we must consider whether the student has had experiences and opportunities to develop those preferences. If not, we can begin to provide them.

Those who evaluate children must provide information regarding the child's strengths and weaknesses. For some children we end up with a long list of weaknesses and very few strengths. Knowledge of basic preferences allows us to

add to the list of strengths. For example, if the child prefers extraversion then he is likely to enjoy group activities and likely to be motivated and rewarded by social praise (attention and approval of others). If the child prefers introversion, then he is likely to appreciate the opportunity to look deeply into things that interest him.

Just as the psychological type preferences themselves are basic strengths (gifts, as Myers preferred to call them), not having developed them to their full potential is a weakness. As an example, for the child who prefers to make feeling judgments, being unclear or unaware of his own values is a real handicap because the "scales" he uses to weigh the pros and cons of certain actions in human terms, are empty.

Refining the measurement of the level of development of a person's psychological type preferences is important. When it has been accomplished through reliable and valid means we will hold one more key to better understanding and better educating our students.

Suggestions for Further Research

Further research is needed before the Discrepancy Index as constructed and evaluated here, can be relied upon as providing anything more than suggestive evidence that level of type development is being validly assessed by it. Findings for reported strength of preference for E-I, S-N, and T-F (D1EI, D1SN, and D1TF) and the total and combined indices (D4EI, D4SN, D4TF, and D1) are supportive of data

earlier presented by Myers indicating that persons with strong and clear preferences fare better academically than persons with low preferences. Evidence was also found that clear and consistent preference for the judging function (whether Thinking or Feeling) was related to employing higher levels of moral reasoning.

Discrepancies on the word-pair/phrase items and differences on the split-halves need closer attention and further evaluation. Word-pair/phrase discrepancy, as calculated in the present study, predicted very little. The split-half difference, as calculated here, did not significantly predict either Moral Judgment Scale scores or academic standings. Other methods of index construction need to be investigated. It is possible that simply adjusting the range of difference for each of the four categories or groups for these two types of discrepant responding would result in better discrimination. With the word-pair/phrase discrepancy index, in particular, this is advised. A disproportionate number of cases fell in group 1 because of the large proportion of subjects who did not change type (i.e., they consistently reported themselves in the same type category on the word-pair items as on the phrase items).

The discrepancy indices, when applied to the J-P scale of the MBTI, showed several interesting relationships which appear non-linear. For strength of preference for J or P (D1JP) and academic variables, students with moderate

preferences fared better than students at the extremes (those reporting highest and lowest preferences). With respect to Moral Judgment Scale scores and the total discrepancy index for J-P (D4JP, combining strength of preference, word-pair/phrase discrepancy, and split-half differences for J or P), the relationship was again nonlinear, with students at the extremes scoring lowest on the MJS and students in the middle groups scoring highest. This trend was reversed in the relationship found between word-pair/phrase discrepancy on J or P (D2JP, see Table 6) and the academic variables. The students with the highest word-pair/phrase discrepancy for J or P (group 4) were consistently higher on the four academic variables than the other three groups. However, for three of the four academic variables the students with no word-pair/phrase discrepancy (group 1) were in second place. Students in the middle (with moderate discrepancies) did not fare as well on the academic variables as those at the extremes. Further study is needed to determine how extreme scores on the J-P scale of the MBTI are correlated with variables known to reflect varying levels of psychological and personal adjustment.

The findings of this study suggest the need for research in several areas. The utilization of more sensitive academic variables than grade point average and more extensive assessment of moral reasoning and decision-making variables is suggested.

In conclusion, the Discrepancy Index does appear to assess "within type" differences. These differences warrant further investigation because of their implications for education and for personal adjustment, in general.

APPENDICES

APPENDIX A
SUPPLEMENTARY ANALYSES OF TEACHER ESTIMATES OF READING LEVEL

The supplementary hypothesis that students with a well developed (i.e., strong, clear and consistent) perceptive function would have higher reading levels than students with a lesser developed perceptive function was supported. Students with high preference for either Sensing or Intuition (D1SN) had significantly higher estimated reading levels than students with low preference for S or N. In addition, strength of preference for the judging function (either Thinking or Feeling) was also positively related to higher estimate of reading level (see D1TF on Table A1). For the total index (D4SN) students with high preference, low word-pair/phrase discrepancy, and low x-y difference had significantly higher estimated reading level than students with lower preference, higher word-pair/phrase discrepancy, and higher x-y difference. The combined indices (D1 and D4) were also positively related to estimates of reading level. Strength of preference (D1SN) and the total index (D4SN) for students with Sensing or Intuition as their theorized dominant function showed the same significant relationship.

Table A1. Significant findings for teacher estimates of reading level.

Hypothesis	N	overall F (df)	p	r^{2*}	$eta^2 - r^{2*}$	eta^{2*}	significant pairwise contrasts (Scheffé's S)	S (p)	significant non-pairwise contrasts	S (p)
D1SN	220	3.04 (3,216)	.03	.019	.022	.041	none		gp 1&2 > 3&4	.824 (.05)
D1TF	220	4.50 (3,216)	.004	.038	.021	.059	gp 1 > gp 3 gp 1 > gp 4	1.51 (.01) 1.29 (.05)	gp 1&2 > 3&4	.914 (.01)
D4SN	220	3.18 (3,216)	.03	.019	.023	.042	gp 1 > gp 3	1.02 (.05)	none	
D1	220	3.71 (3,216)	.01	.028	.021	.049	gp 1 > gp 3	1.09 (.05)	none	
D4	220	2.74 (3,216)	.04	.029	.008	.037	none		none	
D1SN where S or N dominant	116	3.88 (3,112)	.01	.042	.052	.094	gp 1 > gp 3 gp 1 > gp 4	2.38 (.05) 2.35 (.05)	gp 1&2 > 3&4	1.30 (.05)
D4SN where S or N dominant	116	3.38 (3,112)	.02	.031	.052	.083	gp 1 > gp 3	1.38 (.05	none	

APPENDIX B
DESCRIPTIVE STATISTICS FOR DISCREPANCY INDICES

The following five tables provide the mean for each index, the N, and the percent of sample for each of the four categories or groups within each index. Metts (1979) raised the question as to how many discrepancies can be expected to exist in normal samples. If other researchers will report these data, a basis for comparison (with different types of well-described samples) can be established.

Table B1. Descriptive statistics for DI's reflecting strength of preference.

Discrepancy Index	$\bar{X}$	Breakdown for four groups within Discrepancy Index	N	%
D1EI	2.73	group 1 (strongly reported preference)	48	9.9
		group 2 (clearly reported preference)	156	32.2
		group 3 (moderately reported preference)	161	33.2
		group 4 (slightly reported preference)	120	24.7
D1SN	2.87	group 1	25	5.2
		group 2	152	31.3
		group 3	167	34.4
		group 4	141	29.1
D1TF	2.84	group 1	41	8.5
		group 2	134	27.6
		group 3	173	35.7
		group 4	137	28.2
D1JP	2.73	group 1	52	10.7
		group 2	149	30.7
		group 3	160	33.0
		group 4	124	25.6

Table B2. Descriptive statistics for DI's reflecting word-pair/phrase discrepancies.

Discrepancy Index	$\bar{X}$	Breakdown for four groups within Discrepancy Index	N	%
D2EI	1.82	group 1 (no discrepancy S did not change type)	326	67.2
		group 2 (cont. score disc. of 1 to 6 pts.)	18	3.7
		group 3 (cont. score disc. of 7 to 12 pts.)	41	8.5
		group 4 (cont. score disc. of 13 pts. or greater)	100	20.6
D2SN	1.85	group 1	314	64.7
		group 2	23	4.7
		group 3	53	10.9
		group 4	95	19.6
D2TF	1.79	group 1	328	67.6
		group 2	21	4.3
		group 3	45	9.3
		group 4	91	18.8
D2JP	1.95	group 1	304	62.7
		group 2	24	4.9
		group 3	35	7.2
		group 4	122	25.2

Table B3. Descriptive statistics for DI's reflecting split-half differences.

Discrepancy Index	$\bar{X}$	Breakdown for four groups within Discrepancy Index	N	%
D3EI	2.01	group 1 (x-y difference from 0 to 5 pts.)	194	40.0
		group 2 (x-y difference from 6 to 11 pts.)	147	30.3
		group 3 (x-y difference from 12 to 17 pts.)	91	18.8
		group 4 (x-y difference of 18 pts. or greater)	53	10.9
D3SN	2.08	group 1	160	33.0
		group 2	179	36.9
		group 3	92	19.0
		group 4	54	11.1
D3TF	1.97	group 1	183	37.7
		group 2	171	35.3
		group 3	94	19.4
		group 4	37	7.6
D3JP	2.02	group 1	183	37.7
		group 2	157	32.4
		group 3	98	20.2
		group 4	47	9.7

Table B4. Descriptive statistics for DI's reflecting total discrepancies for each MBTI scale.

Discrepancy Index	$\bar{X}$	Breakdown for four groups within Discrepancy Index	N	%
D4EI (D1EI + D2EI + D3EI)	2.37	group 1 (combines point totals of 3 & 4)	104	21.4
		group 2 (combines point totals of 5 & 6)	155	32.0
		group 3 (combines point totals of 7, 8, & 9)	169	34.8
		group 4 (combines point totals of 10, 11, & 12)	57	11.8
D4SN (D1SN + D2SN + D3SN)	2.48	group 1	70	14.4
		group 2	174	35.9
		group 3	177	36.5
		group 4	64	13.2
D4TF (D1TF + D2TF + D3TF)	2.40	group 1	82	16.9
		group 2	177	36.5
		group 3	174	35.9
		group 4	52	10.7
D4JP (D1JP + D2JP + D3JP)	2.43	group 1	93	19.2
		group 2	156	32.2
		group 3	172	35.5
		group 4	64	13.2

Table B5. Descriptive statistics for DI's reflecting combined discrepancies on all 4 MBTI scales.

Discrepancy Index	$\bar{X}$	Breakdown for four groups within Discrepancy Index	N	%
D1 (D1EI + D1SN + D1TF + D1JP)	2.47	group 1 (combines point totals of 4 through 8)	51	10.5
		group 2 (combines point totals of 9 through 11)	212	43.7
		group 3 (combines point totals of 12 and 13)	165	34.0
		group 4 (combines point totals of 14 through 16)	57	11.8
D2 (D2EI + D2SN + D2TF + D2JP)	2.20	group 1 (includes only point totals of 4 - Ss with no type diff. on wd-pr/phrases)	104	21.4
		group 2 (combines point totals of 5 through 8)	221	45.6
		group 3 (combines point totals of 9 through 11)	118	24.3
		group 4 (combines point totals of 12 through 16)	42	8.7
D3 (D3EI + D3SN + D3TF + D3JP)	2.22	group 1 (combines point totals of 4 through 6)	107	22.1
		group 2 (combines point totals of 7 and 8)	194	40.0
		group 3 (combines point totals of 9 through 11)	154	31.8
		group 4 (combines point totals of 12 through 16)	30	6.2
D4 (D1 + D2 + D3)	2.48	group 1 (combines point totals of 12 through 21)	67	13.8
		group 2 (combines point totals of 22 through 26)	173	35.7
		group 3 (combines point totals of 27 through 32)	188	38.8
		group 4 (combines point totals of 33 through 48)	57	11.8

APPENDIX C
TYPE DISTRIBUTION IN STUDY SAMPLE

The type distribution for subjects in the present study is presented in Table C1. This type distribution was compared with that of Myers' sample of 9,320 Pennsylvania high school students (Table C2). The Selection Ratio Type Table program, a 2x2x16 Chi-square contingency table format (Allen & Kainz, 1976), was utilized for this purpose. Results of this comparison are reported in Table C3.

Several general points must be covered before interpreting the data in Table C3. Based on a large number of samples, McCaulley (1978, pp. 32-38) estimates that in the general population extraverts outnumber introverts about 3:1; sensing types outnumber intuitive types about 3:1; in female samples, feeling types outnumber thinking types about 2:1 to 3:1; in males thinking types probably outnumber feeling types about 3:2. McCaulley further points out that for high school student samples the majority of students fall in the extraverted sensing grouping (ES__) with relatively fewer students in the introverted intuitive grouping (IN__). Further, because S-N and J-P are positively correlated, we can expect to find the number of judging types increasing as the number of sensing types

increase, and conversely the number of perceptive types increasing as the number of intuitives increases.

It can be seen from Table C3 that the number of extraverts and introverts in the present study sample are nearly equal. This is an unusual finding, and Table C3 shows this high proportion of introverts in a high school sample significant at the .001 confidence level.

The number of sensing and intuitive types in the present sample are in roughly the same proportion (3:1) as McCaulley expects and as found in Myers' sample. Since SN and JP are positively correlated as noted above, it is highly unusual then to find the large and statistically significant (p = .001) proportion of perceptive types, with perceptive types outnumbering judging types about 3:1.

In the study sample a highly significant (p = .001) proportion of feeling types to thinking types exists (about 3:1). Since the proportion of females to males is close to equal (271 females, 214 males) the proportion of feeling types to thinking types could be expected to be more nearly equal as in Myers' sample with 4,387 females and 4,933 males (see Table C2).

The study sample is atypical from most high school student samples in another important way. It was noted earlier that a large proportion of extraverted sensing (ES) types, possibly as high as 50 to 70% could be expected with a smaller proportion of introverted intuitive (IN) types. Instead, only 29% of the sample are ES types

(X^2 = 46.44, p = .001), 35% are the IS types (X^2 = 34.99, p = .001), and 15% are the IN types (X^2 = 5.08, p = .05). The EN types were found in the proportion expected when compared with Myers' sample.

Table C1. Psychological type distribution for 485 high school students.

SENSING TYPES with THINKING	SENSING TYPES with FEELING	INTUITIVE TYPES with FEELING	INTUITIVE TYPES with THINKING		
ISTJ N = 32 % = 6.60	ISFJ N = 43 % = 8.87	INFJ N = 14 % = 2.89	INTJ N = 4 % = 0.82	JUDGING	INTROVERTS
ISTP N = 37 % = 7.63	ISFP N = 58 % = 11.96	INFP N = 45 % = 9.28	INTP N = 11 % = 2.27	PERCEPTIVE	
ESTP N = 20 % = 4.12	ESFP N = 64 % = 13.20	ENFP N = 57 % = 11.75	ENTP N = 11 % = 2.27	PERCEPTIVE	EXTRAVERTS
ESTJ N = 30 % = 6.19	ESFJ N = 27 % = 5.57	ENFJ N = 23 % = 4.74	ENTJ N = 9 % = 1.86	JUDGING	

	N	%
E	241	49.69
I	244	50.31
S	311	64.12
N	174	35.88
T	154	31.75
F	331	68.25
J	182	37.53
P	303	62.47
IJ	93	19.18
IP	151	31.13
EP	152	31.34
EJ	89	18.35
ST	119	24.54
SF	192	39.59
NF	139	28.66
NT	35	7.22
SJ	132	27.22
SP	179	36.91
NP	124	25.57
NJ	50	10.31
TJ	75	15.46
TP	79	16.29
FP	224	46.19
FJ	107	22.06
IN	74	15.26
EN	100	20.62
IS	170	35.05
ES	141	29.07

NOTES:

Table C2. Myers' students in Pennsylvania high schools (N = 9,320).

SENSING TYPES with THINKING	SENSING TYPES with FEELING	INTUITIVE TYPES with FEELING	INTUITIVE TYPES with THINKING		
ISTJ N = 645 % = 6.92	ISFJ N = 636 % = 6.82	INFJ N = 167 % = 1.79	INTJ N = 244 % = 2.62	JUDGING	INTROVERTS
ISTP N = 388 % = 4.16	ISFP N = 503 % = 5.40	INFP N = 363 % = 3.89	INTP N = 330 % = 3.54	PERCEPTIVE	
ESTP N = 608 % = 6.52	ESFP N = 873 % = 9.37	ENFP N = 708 % = 7.60	ENTP N = 456 % = 4.89	PERCEPTIVE	EXTRAVERTS
ESTJ N = 1395 % = 14.97	ESFJ N = 1302 % = 13.97	ENFJ N = 336 % = 3.61	ENTJ N = 366 % = 3.93	JUDGING	

	N	%
E	6044	64.85
I	3276	35.15
S	6350	68.13
N	2970	31.87
T	4432	47.55
F	4888	52.45
J	5091	54.62
P	4229	45.38
IJ	1692	18.15
IP	1584	17.00
EP	2645	28.38
EJ	3399	36.47
ST	3036	32.58
SF	3314	35.56
NF	1574	16.89
NT	1396	14.98
SJ	3978	42.68
SP	2372	25.45
NP	1857	19.92
NJ	1113	11.94
TJ	2650	28.43
TP	1782	19.12
FP	2447	26.26
FJ	2441	26.19
IN	1104	11.85
EN	1866	20.02
IS	2172	23.30
ES	4178	44.83

NOTES:

Table C3. Comparison of 485 high school students with Myers' Pennsylvania high school student sample (N = 9,320).

Legend: % = percent of total choosing this group who fall into this type.
I = ratio of percent of type in group to % in sample.

SENSING TYPES with THINKING	SENSING TYPES with FEELING	INTUITIVE TYPES with FEELING	INTUITIVE TYPES with THINKING		
ISTJ N = 32 % = 6.60 I = 0.95	*ISFJ* N = 43 % = 8.87 I = 1.30	*INFJ* N = 14 % = 2.89 I = 1.61	*INTJ* N = 4 % = 0.82 I = 0.32"	JUDGING	INTROVERTS
ISTP N = 37 % = 7.63 I = 1.83*	*ISFP* N = 58 % = 11.96 I = 2.22*	*INFP* N = 45 % = 9.28 I = 2.38*	*INTP* N = 11 % = 2.27 I = 0.64	PERCEPTIVE	
ESTP N = 20 % = 4.12 I = 0.63"	*ESFP* N = 64 % = 13.20 I = 1.41#	*ENFP* N = 57 % = 11.75 I = 1.55*	*ENTP* N = 11 % = 2.27 I = 0.46#	PERCEPTIVE	EXTRAVERTS
ESTJ N = 30 % = 6.19 I = 0.41*	*ESFJ* N = 27 % = 5.57 I = 0.40*	*ENFJ* N = 23 % = 4.74 I = 1.32	*ENTJ* N = 9 % = 1.86 I = 0.47"	JUDGING	

	N	%	I
E	241	49.69	0.77*
I	244	50.31	1.43*
S	311	64.12	0.94
N	174	35.88	1.13
T	154	31.75	0.67*
F	331	68.25	1.30*
J	182	37.53	0.69*
P	303	62.47	1.38*
IJ	93	19.18	1.06
IP	151	31.13	1.83*
EP	152	31.34	1.10
EJ	89	18.35	0.50*
ST	119	24.54	0.75*
SF	192	39.59	1.11
NF	139	28.66	1.70*
NT	35	7.22	0.48*
SJ	132	27.22	0.64*
SP	179	36.91	1.45*
NP	124	25.57	1.28#
NJ	50	10.31	0.86
TJ	75	15.46	0.54*
TP	79	16.29	0.85
FP	224	46.19	1.76*
FJ	107	22.06	0.84"
IN	74	15.26	1.29"
EN	100	20.62	1.03
IS	170	35.05	1.50*
ES	141	29.07	0.65*

NOTES: concerning symbols following the selection ratios:
" implies significance at the .05 level, i.e., chi sq. > 3.8
implies significance at the .01 level, i.e., chi sq. > 6.6
* implies significance at the .001 level, i.e., chi sq. > 10.8
- (underscore) indicates Fisher's Exact Probability used instead of chi-square.

APPENDIX D
RESULTS AND DISCUSSION OF SELECTION RATIO TYPE TABLE (SRTT) ANALYSES

Additional analyses of the four categories or groups of each discrepancy index were needed to properly interpret the analysis of variance results presented in Chapter IV. If significant differences in the basic type preferences of subjects existed between the four groups for each discrepancy index, the analysis of variance results would be difficult to interpret.

For example, if for D1SN, category 1 and category 4 significantly discriminated students who did best academically from those who performed less well, then for D1SN, category 1 (students who reported a strong preference for Sensing or Intuition) and category 4 (students who reported only a slight preference for Sensing or Intuition) must be looked at closely to make sure category 1 is not predominantly Intuitive types and category 4 is not predominantly Sensing types. If this were true the picture would become very blurred. Two different interpretations would be supported. The finding might result from the fact that Intuitive types tend to out-perform Sensing types on academic variables, or it could be that students with a clear, consistent, and well-developed preference, either for Sensing or for Intuition, do better academically than those students who

have not developed a strong preference to use in perceiving. In reality, the finding might be explained in part by both factors and by other factors as well.

The SRTT also helps answer the previously posed question as to whether grades get lower as Sensing is more strongly reported. Three sample SRTT's are provided in Tables D1 through D3, and their implications discussed.

Table D1 is the selection ratio type table (SRTT) between group 1 and group 3 for D1EI (strength of preference for Extraversion or Introversion), the students in group 1 reporting very strong preferences for E or I and group 3 reporting only moderate preference. This SRTT table is of interest because group 1 was significantly higher in overall class rank than group 3. Since in past studies Introverts, in general, have been found to make higher grades than Extraverts, it was necessary to make sure that group 1 did not contain significantly more Introverts than group 3. It did not. Hence, this lends further credence to the finding that it is strength of preference for either E or I which accounts for the difference, not preference for I over E, per se.

Table D2 is the SRTT between groups 2 and 4 for D1TF (strength of preference for thinking or feeling), with group 2 reporting clear preferences for T or F, group 4 very slight preference. This table is of interest because group 2 had significantly higher Moral Judgment Scale scores than group 4. In group 2 we find 28 thinking types compared with

106 feeling types. Group 4 had 68 thinking types and 69 feeling types. Thus in the low MJS group (group 4) preference for Thinking and for Feeling are equally distributed. However, in the high MJS group (group 2) we find a significantly higher proportion of Feeling types than Thinking types. It appears that the high number of ENFP's in group 2 accounts for this difference. There are, nevertheless, 28 students in the high MJS group with very strong preference for Thinking. This does not change the interpretation that high preference for either T or F goes with high level of moral reasoning, but the SRTT does raise the question as to why the feeling types (particularly ENFP) are so highly represented in the high MJS group.

A look at the level 5 and 6 responses for the MJS vignettes may shed some light on this. They appear to be the type of response which would appeal to feeling judgment. They call for a subjective weighing of values important to persons involved in the situation, rather than reasoning based on clear-cut principles of right or wrong, or legal contrivance. While not within the scope of the present investigation, this could be determined in future research on type preference and the MJS. It is possible that the very task of completing a moral judgment questionnaire appeals more to feeling than thinking types.

Table D3 shows the SRTT for groups 1 and 3 on D4SN (combining strength of preference, word-pair/phrase discrepancy, and x-y half difference for Sensing or Intuition).

As predicted, group 1 (high preference with low word-pair/phrase discrepancy and x-y difference) had significantly higher overall and academic grade point average than group 3 (moderate preference with high word-pair/phrase discrepancy and x-y difference). We do not find a significant difference in the proportion of Sensing to Intuitive types in these two groups. Thus, this lends further support to the interpretation that strong, clear and consistent preference for one's perceptive function (whether it be Sensing or Intuition) goes with academic achievement. If there had been a higher than usual proportion of Intuitives in group 1 this would have made the above interpretation less credible, because preference for Intuition has been found to be positively correlated with academic success. To some extent this offers evidence for the question posed by Myers (1962) and explored by Weychert (1975). This was the question as to whether grades get lower as preference for Sensing increases. Since we find an equal proportion of types reporting high preference for Sensing as we do types reporting high preference for Intuition in the group with highest academic and overall grade point average, we find no significant trend for grades being lower when preference for Sensing is strong.

Table D1. SRTT analysis for D1EI groups 1 and 3.

	SENSING TYPES with THINKING	SENSING TYPES with FEELING	INTUITIVE TYPES with FEELING	INTUITIVE TYPES with THINKING	
INTROVERTS	ISTJ N = 3 % = 6.25 I = 0.72	ISFJ N = 3 % = 6.25 I = 0.67	INFJ N = 1 % = 2.08 I = 1.12	INTJ N = 0 % = 0.0 I = 0.0	JUDGING
INTROVERTS	ISTP N = 3 % = 6.25 I = 0.72	ISFP N = 5 % = 10.42 I = 0.76	INFP N = 4 % = 8.33 I = 0.84	INTP N = 1 % = 2.08 I = 1.68	PERCEPTIVE
EXTRAVERTS	ESTP N = 1 % = 2.08 I = 0.67	ESFP N = 5 % = 10.42 I = 0.99	ENFP N = 11 % = 22.92 I = 2.46"	ENTP N = 1 % = 2.08 I = 0.84	PERCEPTIVE
EXTRAVERTS	ESTJ N = 0 % = 0.0 I = 0.0"	ESFJ N = 1 % = 2.08 I = 0.30	ENFJ N = 8 % = 16.67 I = 5.37#	ENTJ N = 1 % = 2.08 I = 1.68	JUDGING

Type Table

Legend: % = percent of total choosing this group who fall into this type.
I = self selection index: ratio of percent of type in group to % in sample.

	N	%	I
E	28	58.33	1.27
I	20	41.67	0.77
S	21	43.75	0.62*
N	27	56.25	1.89*
T	10	20.83	0.59
F	38	79.17	1.23
J	17	35.42	0.86
P	31	64.58	1.09
IJ	7	14.58	0.71
IP	13	27.08	0.81
EP	18	37.50	1.47
EJ	10	20.83	1.02
ST	7	14.58	0.49"
SF	14	29.17	0.72
NF	24	50.00	2.06*
NT	3	6.25	1.12
SJ	7	14.58	0.43#
SP	14	29.17	0.81
NP	17	35.42	1.54
NJ	10	20.83	3.05#
TJ	4	8.33	0.42
TP	6	12.50	0.81
FP	25	52.08	1.20
FJ	13	27.08	1.28
IN	6	12.50	0.91
EN	21	43.75	2.71*
IS	14	29.17	0.72
ES	7	14.58	0.49"

NOTES: concerning symbols following the selection ratios:
" implies significance at the .05 level, i.e., chi sq. > 3.8
implies significance at the .01 level, i.e., chi sq. > 6.6
* implies significance at the .001 level, i.e., chi sq. > 10.8
- (underscore) indicates Fisher's Exact Probability used instead of chi-square.

Table D2. SRTT analysis for D1TF groups 2 and 4.

	SENSING TYPES with THINKING	SENSING TYPES with FEELING	INTUITIVE TYPES with FEELING	INTUITIVE TYPES with THINKING	
INTROVERTS	ISTJ N = 8 % = 5.97 I = 0.48	ISFJ N = 9 % = 6.72 I = 0.92	INFJ N = 5 % = 3.73 I = 1.28	INTJ N = 0 % = 0.0 I = 0.0	JUDGING
	ISTP N = 7 % = 5.22 I = 0.51	ISFP N = 18 % = 13.43 I = 1.08	INFP N = 16 % = 11.94 I = 1.82	INTP N = 2 % = 1.49 I = 0.34	PERCEPTIVE
EXTRAVERTS	ESTP N = 5 % = 3.73 I = 0.57	ESFP N = 19 % = 14.18 I = 1.39	ENFP N = 24 % = 17.91 I = 4.91*	ENTP N = 0 % = 0.0 I = 0.0	PERCEPTIVE
	ESTJ N = 4 % = 2.99 I = 0.37	ESFJ N = 7 % = 5.22 I = 1.02	ENFJ N = 8 % = 5.97 I = 2.73	ENTJ N = 2 % = 1.49 I = 0.51	JUDGING

Type Table

Legend: % = percent of total choosing this group who fall into this type.
I = self selection index: ratio of percent of type in group to % in sample.

	N	%	I
E	69	51.49	1.22
I	65	48.51	0.84
S	77	57.46	0.80"
N	57	42.54	1.53"
T	28	20.90	0.42*
F	106	79.10	1.57*
J	43	32.09	0.76
P	91	67.91	1.18
IJ	22	16.42	0.68
IP	43	32.09	0.96
EP	48	35.82	1.49"
EJ	21	15.67	0.86
ST	24	17.91	0.48*
SF	53	39.55	1.13
NF	53	39.55	2.58*
NT	4	2.99	0.24#
SJ	28	20.90	0.64"
SP	49	36.57	0.93
NP	42	31.34	1.72"
NJ	15	11.19	1.18
TJ	14	10.45	0.42#
TP	14	10.45	0.42#
FP	77	57.46	1.75*
FJ	29	21.64	1.24
IN	23	17.16	1.12
EN	34	25.37	2.04#
IS	42	31.34	0.74
ES	35	26.12	0.87

NOTES: concerning symbols following the selection ratios:
" implies significance at the .05 level, i.e., chi sq. > 3.8
implies significance at the .01 level, i.e., chi sq. > 6.6
* implies significance at the .001 level, i.e., chi sq. > 10.8
- (underscore) indicates Fisher's Exact Probability used instead of chi-square.

Table D3. SRTT analysis for D4SN groups 1 and 3.

SENSING TYPES with THINKING	SENSING TYPES with FEELING	INTUITIVE TYPES with FEELING	INTUITIVE TYPES with THINKING		
ISTJ N=10 %=14.29 I=3.16#	ISFJ N=6 %=8.57 I=1.17	INFJ N=1 %=1.43 I=0.28	INTJ N=1 %=1.43 I=1.26	JUDGING	INTROVERTS
ISTP N=5 %=7.14 I=1.05	ISFP N=9 %=12.86 I=1.03	INFP N=5 %=7.14 I=0.79	INTP N=2 %=2.86 I=5.06	PERCEPTIVE	
ESTP N=2 %=2.86 I=0.51	ESFP N=3 %=4.29 I=0.23#	ENFP N=6 %=8.57 I=1.01	ENTP N=2 %=2.86 I=1.26	PERCEPTIVE	EXTRAVERTS
ESTJ N=10 %=14.29 I=2.30"	ESFJ N=5 %=7.14 I=1.05	ENFJ N=2 %=2.86 I=0.72	ENTJ N=1 %=1.43 I=1.26	JUDGING	

Legend: % = percent of total choosing this group who fall into this type.
I = self selection Index: ratio of percent of type in group to % in sample.

	N	%	I
E	31	44.29	0.83
I	39	55.71	1.19
S	50	71.43	1.04
N	20	28.57	0.90
T	33	47.14	1.67#
F	37	52.86	0.74#
J	36	51.43	1.42"
P	34	48.57	0.76"
IJ	18	25.71	1.42
IP	21	30.00	1.04
EP	13	18.57	0.53"
EJ	18	25.71	1.42
ST	27	38.57	1.67"
SF	23	32.86	0.73
NF	14	20.00	0.75
NT	6	8.57	1.69
SJ	31	44.29	1.78#
SP	19	27.14	0.62"
NP	15	21.43	1.05
NJ	5	7.14	0.63
TJ	22	31.43	2.42*
TP	11	15.71	1.03
FP	23	32.86	0.68"
FJ	14	20.00	0.86
IN	9	12.86	0.81
EN	11	15.71	0.99
IS	30	42.86	1.38
ES	20	28.57	0.77

NOTES: concerning symbols following the selection ratios:
" implies significance at the .05 level, i.e., chi sq.> 3.8
implies significance at the .01 level, i.e., chi sq.> 6.6
* implies significance at the .001 level, i.e., chi sq.> 10.8
- (underscore) indicates Fisher's Exact Probability used instead of chi-square.

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BIOGRAPHICAL SKETCH

Janie Darlene Sweet is the only child of Everett and Selma Kellams, born in Evansville, Indiana, on February 4, 1950. She attended public schools, through tenth grade, in Charlotte, North Carolina. Moving to Los Angeles County, California, in 1966, she graduated from Birmingham High School in the San Fernando Valley in June, 1968. She entered the University of Florida in Fall of 1968 and received her B.A. in psychology in 1972, M.Ed. in psychological foundations of education in 1975, and Ph.D. in foundations of education in 1981.

As a graduate student at the University of Florida she served on the staff of the Center for Allied Health Instructional Personnel, under the directorship of Dr. Margaret K. Morgan, as a graduate assistant and graduate research assistant until June, 1975. She then joined the staff of Dr. Mary H. McCaulley at the Center for Applications of Psychological Type, serving as general manager of the center from the time of its establishment to December, 1978.

She moved to Chester, South Carolina, in 1979 and completed state requirements for certification as a level II school psychologist in June, 1980, through additional course work at Winthrop College in Rock Hill, South Carolina, and internship to Chester County Schools. She is employed full

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She has two sons, Scott, age 10 and George, Jr., age 2. Her husband, George Montgomery Sweet, also a UF graduate, is a math instructor at Winthrop College and is working toward completion of his doctoral program in mathematics. Her major interests are family activities, small-scale farming, fishing, and reading.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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Professor of Foundations
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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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