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Relationships between psychological types and assessment center performance of Ohio Cooperative Extension Agents

Ishaya, Joseph B., Ph.D.

The Ohio State University, 1991

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Relationships Between Psychological Types and Assessment Center Performance of Ohio Cooperative Extension Agents

Dissertation

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

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Chapter I

Introduction

The theory of psychological types may be related to assessment center situations and processes. An assessment center is a place and process where individuals are evaluated for managerial capabilities or lack of managerial capabilities in order to select, promote, or facilitate the development of an individualized training program in an organization (Thornton & Byham, 1982).

Assessment centers conduct a job analysis to describe the attitudes, knowledge, and skills required for management positions. The attitudes, knowledge, and skills derived from the job analysis are then used to design assessment center activities. Assessment center participants are involved in assessment center activities while their managerial capabilities are being determined by trained evaluators.

The theory of psychological types suggests that the preferred manner in which people perceive information and make decisions about the information and the attitudes they take to situations would determine their behavior in these situations.
(Jung, 1921). Myers (1962) clarified and made explicit the theory of psychological types. She also asserted that human behaviors are organized and can be understood by examining an individual's orientation to these psychological processes. In an intensive literature review, Allport (1937) differentiated between personality traits and psychological type. He concluded that people cannot be said to be a psychological type; rather they fit psychological types. In this context, psychological types don't exist in people or nature, but can be determined only by observation.

Myers (1962) operationalized Jung's theory of psychological types in her instrumentation of the Myers-Briggs Type Indicator (MBTI). The MBTI "types" people into psychological types (groups). There are 16 possible psychological types. Each type has its own variety of capabilities. Research has shown that psychological types, operationalized by the MBTI, relate to significant variables in many situations. For example, Foster and Horner (1990) found that the MBTI relates meaningfully to "how teachers teach, how students learn, how leaders lead, and how people work and communicate" (p. 79).

Employers often utilize assessment centers, which measure individual characteristics as they are related to educational and occupational choice so the employee can adjust to or succeed in their careers (Herr, 1981). The relationship between psychological types theory and educational environments and practical translation of those concepts are provided by previous research (Lawrence, 1983; McCaulley & Natter, 1984; Jansen, 1987; Myers & McCaulley, 1985). Much work
has been done to date except in the relationships between psychological typing and the assessment center process.

Statement of the Problem

Assessment centers attempt to measure managerial capabilities for the purpose of assessment, selection, promotion, and training (Thornton & Byham, 1982). Kwarteng (1986), Bart (1986), and Boone (1988) studied the relationship between a number of variables and the Ohio Cooperative Extension Service (OCES) assessment center. Psychological types attempt to measure attitude, perception, judgment, and orientation to help people reach their potential through understanding their psychological make-up (Jung, 1921; Myers, 1962).

Research has shown that psychological type relates usefully to "performance measures and behavior ratings" (Mendelson, 1965, p. 322); job roles (Church, 1982); selection and training (Wachowiak & Bauer, 1977); and "can help predict students' performance" (Barrett, 1988, p. 50). However, the relationships between psychological type and assessment center performance remain unstudied. Lack of such information represents a gap in knowledge of the assessment center that attempts to measure managerial capabilities or lack of capabilities.

This study is designed to understand the relationship between psychological types and assessment center performance of OCES extension agents. Given that some of the goals of assessment centers and of counselors and others who use
psychological types are similar and that psychological make-up is being assessed by both of them, can one say that the two are similar; and if so, how similar, and in what ways?

**Purpose and Objectives**

The purpose of this study is to describe the relationships between psychological types and assessment center performance of Ohio Cooperative Extension agents. Demographic variables that could have influenced the possible relationship between psychological types and assessment center performance were identified and measured.

**Objectives of the Study**

The objectives of the study were:

1. To describe the demographic variables of OCES extension agents who attended the OCES assessment center.
   a. Gender.
   b. Age.
   c. Number of years of work experience in the Cooperative Extension Service (CES).
   d. Degree (B.S./B.A., M.S./M.A., Ph.D.).
   e. Year the extension agent attended the assessment center.
f. Major program area:
   - Agriculture.
   - Home economics.
   - 4-H and youth.
   - Community and natural resources development (CNRD).

2. To describe the assessment center scores for the OCES extension agents.

3. To describe the psychological profile of extension agents who attended the assessment center according to the MBTI.

4. To describe extension agents who attended the assessment center according to their typological preference for attitude, perception, judgment, and orientation.

5. To describe the extension agents who attended the assessment center according to their Keirsey and Bates' (1978) temperament preferences analyzed through the MBTI.

6. To describe the relationships between the Keirsey and Bates (1978) temperament preferences and assessment center performance.

7. To describe the relationships between selected demographic variables and assessment center performance.

8. To describe both the categorical and continuous relationship between the MBTI, attitude, judgment, perception, orientation preference scores, and assessment center performance.
To describe the relationship between demographics variables found to be related to assessment center performance and psychological type variables found to be related to assessment center performance.

**Significance of the Study**

This study, which attempts to describe the relationships between psychological types and assessment center performance, has both theoretical and practical significance. If the relationships between the psychological types and assessment center performance are supported, then the results will enhance the body of knowledge in the field of psychological evaluation.

Practically, if the relationships between the psychological types and assessment center performance are supported, then the Ohio Cooperative Extension Service can use the MBTI as an alternative or as a supplement to assessment center performance. However, if the relationships between psychological types and assessment center performance are not supported, then the results may challenge formative psychological evaluation results and related studies.

In general, knowledge of the relationships between the way Jung types people according to their attitudes and psychological functions and the way in which assessment centers evaluate participants according to their abilities, attitude, knowledge, and skills can be helpful in determining whether or not Jung's system would be helpful in the field of evaluation.
Definition of Terms

The following terms were constitutively and operationally defined based on their use in the study.

A. 1. Psychological types represent the way people prefer to perceive, judge, and relate to the world (Jung, 1921). In this study, psychological types is operationally defined as the choice between each of four dichotomies scales – attitude (extraversion/introversion); perception (sensing/intuition); judgment (thinking/feeling); orientation (judging/perceiving) – used in the MBTI to identify the structure of an individual's psychological type.

2. Attitudes: extraversion and introversion are attitudes which describe where people direct their attention.
   a. Attitude preference is the choice between extraversion and introversion which describes the preferred manner in which people direct their attention.
   b. Extraversion attitude preference directs one's attention and energy to the outer world of people and things.
   c. Introversion attitude preference directs one's attention and energy to the inner world of ideas.

   \textit{Attitude preference is operationally defined as the attitudinal preference score received on the extraversion-introversion sub-scale of the MBTI.}
3. Perception: sensing and intuition are perceptive functions which describe how people gather information both outside and inside themselves and how these functions appear in observable behavior.

   a. Perception preferences is the choice between sensing and intuition which describes the preferred manner in which people gather information outside and inside themselves.

   b. The function of sensing perception preference utilizes the five senses to tell people what is there and is actually happening both inside of themselves and outside.

   c. The function of intuition perception preference gathers information beyond the five senses and includes information that is not consciously perceived.

   Perception preference is operationally defined as the score received on the sensing-intuition sub-scale of the MBTI.

4. Judgment: thinking and feeling are judgment functions which describe how people make decisions on information perceived and how the two appear in observable behavior.

   a. Judgment preference is the choice between thinking and feeling functions which describe the preferred manner in which people make decisions on information perceived.

   b. The function of thinking judgment preference objectively decides by analyzing and weighing available evidence.
c. The function of feeling judgment preference decides on the basis of a hierarchy of available values.

*Judgment preference is operationally defined as the score received on the thinking-feeling sub-scale of the MBTI.*

5. Orientation: judging and perceiving are function of orientation which describe identifiable attitudes and behaviors to the outside world. It is also used in conjunction with the extraversion and introversion scale to identify which of the two functions is the dominant function and which is the auxiliary. It also describes how these functions appear in observable behavior.

a. Orientation preference is the choice between judging and perceiving functions which describe the primary attitude which people take toward the world.

b. The function of the perceiving orientation preference utilizes either sensing or intuition as a primary attitude towards the world.

c. The function of the judging orientation preference utilizes either thinking or feeling as a primary attitude towards the world.

*Orientation preference is operationally defined as the score received on the judgment-perception sub-scale of the MBTI.*
6. The dominant function or process is the function or process that is first developed, most conscious and differentiated, and is the dominating force of an individual's psychological type.

7. The auxiliary function or process is second in importance and provides balance between perception and judgment and between extraversion and introversion.

8. The inferior function is, in type, the opposite of the dominant function and is called the fourth function. It may be nearest to the unconscious and the least differentiated. It has been called a source of both problems and potential for growth.

9. Sensing, intuition, thinking, and feeling are the four basic mental processes or functions.

10. Process and function are the same. But process is the term used by and for the general public; function is the technical term.

11. Type is used not to denote a single preference, but one of the 16 possible combinations of four preferences within the theory of psychological types.

B. Assessment center performance. An assessment center is a place and process where people are evaluated for the purpose of determining their managerial capabilities or lack of capabilities. Assessment center performance is an outcome measure. Assessment center performance is a consensus rating determined by trained evaluators in assessment center procedures.
Assessment center activities are determined through analysis. *Assessment center performance is operationally defined as the consensus score OCES extension agents obtained on their managerial capabilities or lack of capabilities on each of the 16 job dimensions determined by trained evaluators after they had participated in seven simulated exercises over a two-day period.*
This chapter describes the origin and the elements of the theory of psychological types: (a) attitudes, (b) perception functions, (c) judgment functions, (d) orientation functions, and (e) dominant function. The chapter includes a review of related literature. The purpose of the review is to: (1) identify Jung's theory of psychological types, the theoretical framework of the MBTI and Keirsey and Bates conceptual framework; (2) report studies related to Jung's theory of psychological types, psychological types in education literature, management literature, and agriculture literature; and (3) report studies related to assessment center performance literature.

Efforts to categorize human types dates back as far as 460-377 B.C. when Hypocrites suggested that the human body contained different "humors" (Rowe, 1981) and those efforts have continued throughout the last 24 centuries. At the onset of this century, James hypothesized that people could be either "tough-minded" or
"tender-minded" (cited in Jung, 1921). By the 1950s, placement of people into psychological groups or "types" was rapidly accelerating.

The conceptual framework of this study is grounded in Jung's (1921, 1923) theory of psychological types. Jung (1921) postulated that much of what seems chance variation in human behavior is not due to chance, but in fact, the logical result of a few basic observable differences in mental functions or processes. He described psychological types as the dominant manner in which people perceive, judge, and relate to the world. These observable differences or types, according to Jung, can be classified or "typed" into psychological types or four possible combinations of mental processes consisting of two perception processes (sensing and intuition) and two judgment processes (thinking and feeling). Perceptions represent the manner in which people gather information from the environment. Judgments represent the manner in which people interpret the information perceived. The preferred perception function of either sensing or intuition and the preferred judgment function of either feeling or thinking expressed with the preferred attitude of either extraversion or introversion constitutes psychological type.

According to the theory of psychological types, people use both attitudes and the four functions or processes, but they tend to "choose" and become more skilled in one attitude and two functions: a dominant function and a first auxiliary function. The remaining two functions become a second auxiliary function and a third auxiliary function. The third auxiliary function is the fourth in the hierarchy of these functions and is inferior and least developed in contrast to the dominant function. This
inferior function is always the polar opposite of the dominant function. Just as the dominant function is the preferred process of adaptation as well as the one people utilize with the most ability, one's inferior function is the least preferred and is the most problematic and frustrating when called to use it.

Jung's theory utilizes three dimensions to identify psychological types: (1) how individuals approach life; (2) the way they become aware of the world; and (3) the way they form opinions about the world. The first dimension includes two attitudes: "extroverts" focus on the world around them, whereas "introverts" focus on the inner world of self and ideas. The second dimension includes two functions, portraying people who use concrete, simple, contextual facts: "sensing perceivers" and those who utilize possibilities (hunches, gut feelings): "intuitive perceivers." The two functions of the third dimension include those who form opinions through objective information and logical connections (ignoring special interests): "thinking" types. And those who rely on relative values, merits of issues, and subjective reasoning to form their opinions: "feeling" types (Jung, 1921, p. 12). According to Jung, people tend to prefer one of the two psychological attitudes and functions in each of these three dimensions and, through use, the preferred function or attitude becomes stronger. Characteristic traits develop and psychological type or group becomes evident (Jung, 1921). Psychological type indicates an individual's way of collecting information, interpreting the world, and functioning in it.

Three assumptions may be taken from Jung's theory of psychological type. First, what people experience in the past and what they expect in the future tends to
have an influence upon both their behavior and their personalities. Second, humans are capable of constant and creative development. Third, the personality of a human being is consistently open to receiving and exchanging information. These assumptions led Jung to suggest that behavior and other personality subsystems can change as a result of interactions with the external environment; other people would be highly influential. According to Jung, psychological type is one determinant of human behavior. But the behavior of other people would also influence one's behavior (Hellriesel & Stocum, 1979).

Literature by other authors (McCaulley, 1977; Jolandi, 1973; Mattoon, 1981; Von Frange & Hillman, 1979; Keirsey & Bates, 1978; Myers, 1962, 1965, & 1980) and literature related to the MBTI was utilized to clarify and expand these concepts. Myers (1962) clarified Jung's theory and explained that human behaviors are organized behaviors which can be understood by examining an individual's orientation in regard to these attitudes and functions.

Allport (1973) reviewed personality type theory and in his conclusion he differentiated between personality trait and type by saying that people cannot be said to have psychological type. Rather they fit psychological types. In this context, psychological types do not exist in people or nature, but can be determined only by observation. Jung's type theory, on which the MBTI is based, considers what personality changes may occur over time; the MBTI does not (Jung, 1921, 1923). It only assesses psychological types in effect at the time the instrument is administered. Psychological characteristics develop unevenly. An individual becomes "whole" or
mature but his or her later-acquired characteristics do not attain the maturity of the older ones.

Piaget (1970) explained that mental characteristics can exist only in a system because traits, disposition, and temperament are interdependent. Spranger stressed the uniqueness of an individual's mental life and added that it could not be reduced to an elementary level (cited in Wolman, 1973).

The psychology of personality structures developed by Spranger suggests that personality elements need to be examined within their complete context. Personality assessment is useful when based on two important assumptions: (a) A person develops psychologically and physically over time, but his or her original dispositions remain a part of that personality throughout a lifetime and (b) within the personality, the structural interdependence of traits, dispositions, and temperaments will remain constant (Harper, 1975).

The attitudes will be described to provide an understanding of the natural "psyche" energy or interest. The separate elements of the model of psychological types: (1) perception functions, (2) judgment functions, (3) orientation functions, and (4) the dominant functions will be described to clarify these concepts.

**Attitudes**

An attitude is the predisposition that an individual develops in relation to the environment. The two major attitudes, extraversion and introversion, describe
people's basic stance in dealing with things they encounter in the environment. Jung conceived the human "psyche" as a field of energy which flows inward towards self or outward towards the environment. The outward flow of "psyche" energy is the basis of extraversion and the inward flow of "psyche" energy is the basis of introversion.

People utilize both attitudes, appearing to other people more like extroverts at one time and more like introverts at a different time. However, people choose one attitude more often than the other and, thus, they seem to other people to belong to that attitude group or type. Extraverted people focus their interest on the external world of people and things. Introverted people, on the other hand, focus their interest on the internal world.

Emphasizing the specific characteristics of an attitude, a function, or a type one might create the impression of a "pure type", one that does not exist in the actual world of people. Jung cautioned against utilizing the psychological groups as specific and separate; one should view them in totality and only as a point of reference for practical understanding of self and other people. There are no pure extroverts or introverts, only extraverted or introverted function-groups (Figure 1) such as extraverted-intuition or introverted-thinking (Jung, 1923, p. 253; Evans, 1964, p. 96).
Extraversion-Introversion Dimension

Extraversion is indicative of those people who are "out going" with their "psyche" energy or interest. The extroverts, according to Jung, "think, feel, and act in relation to objects" (p. 427). The extroverts have an apparent supply of energy.

Introversion includes those people who direct their "psyche" energy or interest towards self-ideas. The introverts, according to Jung, "think, feel, and act in a way that clearly demonstrates that the subject is the prime motivating factor" (p. 452). The introvert might appear withdrawn about dealing with things or people they encounter in the environment.

While the extrovert's interest resides primarily in the object, the interest of the introvert results in an attitude where the object is of secondary importance and the effect of the objective upon the individual is primary. Whereas in introversion, the subject moves from the subjective needs of the individual, the extravert's interest moves from the object to the subject. In this sense, extraversion might be seen as the subject drawing interest from the object.

Extraversion and introversion represent one's basic stance in the process of adaption in terms of whether the person tends to be objective or subjective with his/her interests. While extroverts unconsciously devalue the subject in favor of the object, the introverts devalue the objective world in favor of the subjective one (Homans, 1979).

While the directionality of interest resulting from an individual's predominant stance of either attitude is primarily toward or from the object, there seems to be an
element of opposite direction in interest. People interact with the subject-object relationship in such a manner that extraverted persons receive from the object a certain meaning and interest which helps them to maintain a balanced relationship in the process of adaptation. Similarly, if individuals are introverted, then they restore to the object much of the meaning it has exuded to them.

Mattoon (1981) wrote of the contrast between extraversion and introversion in her explanation of Jung's psychological types. Extraverted people are more likely to adjust well to the environment. Introverted people, however, prefer their thoughts to conversation with other people and enjoy being alone. Myers (1980) contrasted the attitude of extraversion and introversion in her explanation of Jung's theory. She explained that extraverted people base their conduct on the outer situation. On the other hand, introverted people consider the inner situation-idea concepts.

Extraverted people, according to Myers, get involved in new experiences without hesitation. Introverted people, in contrast, will hesitate and might not get involved. Extroverts expand energy, whereas the introvert conserves energy. Jung's description of the two attitudes, along with Mattoon (1981) and Myers (1962, 1980) expansion and clarification of the concept, supports the range between the two extremes.
Jung (1923) wrote, in his description of psychological types, that differences in human behavior could be explained by the way people prefer to use their mental processes or functions. By mental function, Jung (1923) means "a certain form of 'psyche' activity that remains the same under varying circumstances; yet, is still distinct from the other functions..." (p. 436). These mental functions to which Jung was referring were perception, either sensing or intuition, and judgment, either thinking or feeling.

Jung (1921) identified sensing, intuition, thinking, and feeling as the basic psychological functions. Whichever dominates constitutes a person's psychological type. These four functions, T-F and S-N, are in polar sets, therefore, these functions cannot operate simultaneously, hence preferential use of one of the perceiving functions over the other and one of the judgment functions over the other means less development of the corresponding opposites. Thus, there are four possible combinations: sensing-thinking, sensing-feeling, intuitive-thinking, and intuitive-feeling. In these pairs one will be the dominant function and the other one will be the auxiliary function.

The dominant function of the extroverts will be extraverted and the auxiliary introverted. The reverse is true for the introverts; the dominant function of the introvert will be introverted and the auxiliary will be extraverted. Thus, there are
what Jung refers to as the eight distinguishable psychological types (Figure 1) and to what is reported as the sixteen combinations in MBTI (see Table 2).

**Perception Processes or Functions**

The perception functions of sensing and intuition are used in Jung's theory of psychological types to describe how people prefer to perceive what they are experiencing. Both sensing and intuition are functions of information gathering. These functions are, in Jung's words, irrational (non-rational) in his description because they take in information without reasoning. These functions receive stimuli from the environment and from within the individual.

**Sensing-Intuition Dimension**

While the sensing function perceives information from the five senses as well as from sensation originating from within the body, the intuitive tends to perceive or receive stimuli holistically, often losing sight of details in favor of seeing a world of possible meanings. Sensing receives or perceives information as it touches the senses, however, intuition perceives information using the content of the unconscious incorporating ideas and association from the individual to interpret the information. Intuition uses what is sometimes called the "sixth sense."

Sensing, according to Jung, "mediates perception of a physical stimulus" (p. 461). Hall and Lindzey (1978) describe sensing as the perceptual or reality function:
"it yields concrete fact or representation of the world" (p. 125). For sensing types, whatever comes directly through their five senses is their own personal experience and therefore is to be trusted. Intuition, the other perception function, is concerned with possibilities, relationships, and meaning found in experience. The sensing function concentrates on the information gathered by the five senses, but intuition "is the function that mediates perception in an unconscious way" (Jung, 1923, p. 453). Whereas sensing sees details and parts, intuition sees only the whole.

Because of the difficulty of explaining the perception of intuition, Mattoon (1981) suggested that people with dominant intuition "...sometimes feel their perceptions are considered by other people to be inferior" (p. 63). Myers (1980) described the intuitive as being "comparatively uninterested in sensory reports of things as they are;" they wait for "intuition" to come to them from the unconsciousness showing them visions of possibilities for the situation, whatever it is (p. 57). Craving inspiration, Myers (1980) noted, intuitives "face life expectantly" and are imaginative at the expense of observation" (p. 63). Jacobi (1973) stressed the unconscious nature of intuition by describing it as having a "capacity for a conscious inner perception of inherent potentialities of things" (p. 12). One is struck by the opposite nature of the two kinds of perception; it seems as if different worlds are seen.
Judging Processes or Functions

Judging the functions of thinking and feeling, Jung's conceptual framework describes how people prefer to interpret the information perceived with either sensing or intuition. Both thinking and feeling are rational functions. They are rational functions because they are based on reasoning. While the thinking function judges or interprets information perceived in an objective manner, the feeling function interprets information perceived in a personal or subjective manner.

Thinking-Feeling Dimension

Jung (1923) stated that thinking is the "...function, while following its own laws, brings the contents of ideation into conceptual connection with one another" (p. 481) and "feeling is primarily a process that takes place between the ego and a given content, a process, moreover, that imparts a definitive value in a sense of acceptance or rejection" (p. 434). Whereas a thinker would judge from a correct-incorrect position, a feeling person would decide from an appropriate-inappropriate, an exciting or dull, or a good or bad stance.

It is only with these two functions that sex differences are noted. While more females indicate a preference for feeling judgment than for thinking judgment, more males select the thinking judgment (Jung, 1923; Mattoon, 1981; Myers, 1962, 1980; Von Frange & Hillman, 1979).
Thinking is essentially impersonal. "Its goal is objective truth, independent of the personality and wishes of the thinker or anyone else" (Myers, 1980, p. 65). Feeling, a rational function, "evaluates the object, determines whether it is desirable or undesirable, and its degree of importance" (Mattoon, 1981, p. 64). Feeling in essence is subjective based on values of a person. The system of values, as a function itself, can develop over a period of time into a differentiated process. As the process develops, the person gains.

Myers (1980) indicates what the behavior of the feeling type may look like. "It will concentrate on persons rather than things, more likely agree with others than question them, choose tact over truthfulness, be more naturally friendly whether sociable or not, and finally be supportive of the efforts of others" (p. 68). Contrasting thinking and feeling judgment, Von Frange and Hillman (1979) stated that "although feeling does not operate in syllogisous, there is an exactitude and demonstratable reason in its operation" (p. 91). Thus, feeling judgment decides which is more appropriate in a situation and acts accordingly.

**Orientation Processes or Functions**

The orientation processes or functions describe the judging and perceiving functions. The orientation function was implicit in Jung’s conceptual framework but it was made explicit by Myers (1962) in order to permit the identification of the dominant preference between the S-N and T-F variable (McCaulley, 1981). In
conjunction with one of the extraversion-introversion attitudes, the judging-perceving functions determine whether one's personality is dominated by the sensing-intuition function or by the thinking-feeling function (Myers, 1962).

Perceiving-Judging Dimension

Jung (1921) found the mental functions of sensing and intuition to be irrational (non-rational) and the functions of thinking and feeling to be rational. A "perceiving" preference indicates in extroverts, the dominance of an irrational (non-rational) mental function, either sensing or intuition. A "judging" preference indicates in extroverts, the dominance of the rational mental functions, either thinking or feeling. A "perceiving" preference indicates in introverts the dominance of the rational mental functions, either thinking or feeling. A "judging" preference, on the other hand, indicates in introverts the dominance of the irrational mental functions, either sensing or intuition.

Whereas judging functions are based on logic or reasoning, the perceiving functions are in constant flux and lack direction and intention. Consequently, Jung (1921) described the judging functions as a rational function and the perceiving functions as an irrational (non-rational) function. The judging types of people believe that life should be decided while the perceptive types regard life as something to be experienced and understood. Thus, judging types like things to be settled, however perceptive types prefer to keep their opinions open so that no valuable experience will be missed.
According to Myers (1980), "a bad decision is better than none" makes sense only to a judging type. The perceptive types do not come to conclusions about a problem, rather they always hope they can solve the problem by understanding it better, by "seeing to the bottom of it;" if they are intuitives or by "seeing it from all sides," if they are sensing types.

**The Dominant Processes or Functions**

Jung (1921, 1923) suggested that each individual has a preference for one perceiving and one judging function. The combination of the perceiving and judging preferences is known as a function type or functional group. This combination is referred to as a dominant (primary) and auxiliary (secondary) function.

The dominant function is the one most well-developed and conscious, and the auxiliary is a "less differentiated function"... [which] exerts a co-determining influence (Jung, 1923; 1971, p. 405). It is only through the process of differentiation, the development of one function through habitual use, that any function can be considered as an influencing trait of personality. In youth the four functions are fused, undifferentiated. One characteristic of fused function is that none of the four can operate independently. Jung (1921) described undifferentiated thinking and feeling:

Undifferentiated thinking is incapable of thinking apart from the other functions; it is continually mixed up with sensations, feelings, and intuitions, just as undifferentiated feeling is mixed up with sensations.
and fantasies, as for instance in sexualization (Freud) of feeling and thinking in neurosis (p. 424).

Differentiation begins when one of the four mental functions develops to the degree where it can operate independent of the other three. The independent well-developed function was described by Jung (1923) as the dominant function. The function opposite the dominant function in the same corresponding perceiving or judging dichotomy is called the inferior function. If, for example, the dominant function is thinking, then the inferior function is feeling. This phenomenon, according to Jung (1921, 1923) resulted from an individual's ability only to control consciously a part of his or her "psyche" energy.

The "psyche" energy is directed towards the use of the dominant function as a means of adapting to the environment. As a result, the inferior function is the least used. If, for example, the dominant function is thinking, an individual relies upon this function to control and direct his or her life with the majority of the judgments he or she makes. The infrequent utilization of feeling leaves the feeling function most directly attached to the unconscious. In responding to value choices and situations, the individual will usually first attempt to resolve it through use of the thinking function. Yet, when it is clear to the individual that a choice of values must be made (this might not occur), he or she tends to react to the value choice with a combination of conscious and unconscious contents from the psyche of which the individual is only partially aware.

The two functions not in the same category with the dominant and inferior functions are called the auxiliary functions. Hence, if thinking is dominant, sensing
and intuition are the two auxiliary functions. One of the two auxiliary functions will differentiate first and will be relied upon to provide a balancing of perceiving and judging, or judging and perceiving, for adaptation. The differentiation of the first auxiliary function is referred to as the first auxiliary; the second, as the second auxiliary. The four functions, therefore, while commonly shared by all individuals, develop differently and accordingly. They permit categorization of groups of individuals by their most developed psychological traits.

Besides the four mental functions, attitude also influences the development of a psychological type. This characteristic is probably the most familiar aspect of Jung's theory: the tendency of an individual towards extroversion or introversion, phenomena which Jung referred to as attitudes. An attitude is the disposition that the individual develops in relation to the environment. Jung conceptualized the human psyche as a field of psychic energy which flows both inward towards self, or outward towards the environment. The inward flow of psychic energy is introversion; the outward flow is extroversion. According to Jung (1921, 1923), the mechanisms only became character traits when one of the processes develops into a habitual preference. Still, all individuals share both attitudes.

The preferred attitude of the dominant function is in inverse association with the less developed functions. In extroverts the dominant function is extraverted, but in introverts it is introverted. Jung observed and determined that each individual was characterized by his or her dominant function. This function is the decisive one for the orientation of consciousness. The dominant function rules the orientation of the
individual, and the auxiliary function provides balance and supplements the dominant.

The effect of the inferior function is part of "the shadow" in Jung's (1921) conceptual framework. The inferior function is weak but, it may declare itself at unexpected times. The shadow, according to Von Frange and Hillman (1979), prefers to reveal itself with negative messages, seeing the sinister sides of issues first, whereas the dominant function works with the positive perspective of its opposite orientation. Much misunderstanding among people is associated with the differences between the shadow and the dominant function (Von Frange & Hillman, 1979).

Myers (1980) explained the role and relationship between the dominant and the auxiliary: "A good way to visualize the difference is to think of the dominant process as the General and the auxiliary process as his Aide" (p. 14). Often it is easier to determine the two preferred functions than it is to determine which one is dominant and which auxiliary. Myers' (1980) emphasizes the difficulty of seeing the dominant function in extroverts and introverts:

In the case of the extravert, the General is always out in the open. Other people meet him immediately and do their business directly with him. They can get the official viewpoint on anything at any time. The Aide stands respectfully in the background or disappears inside the tent (p. 14).

The extravert's dominant may be easily seen as opposed to the dominant function of the introvert, which can't be seen easily.

The introvert's General is inside the tent, working on matters of top priority. The Aide is outside fending off interruptions, or, if he is inside helping the General, he comes out to see what is wanted. It is the Aide whom others meet and with whom they do their business.
Only when the business is very important (or the friendship is very close) do the others get in to see the General himself (p. 14).

The introvert's auxiliary may be mistaken for the dominant and thus the introvert may be misjudged by the observers. Each type would appear in two ways to an observer; one would be with the perception function extraverted so that the observer would be more aware of that specific function (sensing or intuition); the second would be with the judging function extraverted so that the observer would be more aware of the specific function (thinking or feeling).

The strong influence that the development of the dominant function has in shaping the adaption preference of an individual led Jung to identify the combination of attitude and function as psychological type distinctions. The pairing of one of the attitudes of introversion or extroversion with one of the four mental functions led Jung to conclude the existence of eight personality types. These are shown in Figure 1.

**Theoretical Framework of the MBTI**

The Myers-Briggs Type Indicator (MBTI) was designed to measure psychological type based on the theory advanced by Carl Jung (1921, 1923). Myers and Briggs (1962) include in their theoretical construct of the MBTI the identification of the first auxiliary function as an aspect of psychological type. The addition of the first auxiliary function splits Jung's eight psychological types into sixteen distinct types. Instead of Jung's extraverted thinker, there are the extroverted thinker with
sensing and extraverted thinker with intuition. The two attitudes (E and I) and four functions (S and N, T and F) as well as the two orientation preferences of P and J combine into 16 possible Jungian types, all of which can be identified by MBTI. While Jung's eight psychological types were identified by preference for an attitude as the carrier of the dominant function, Myers and Briggs sought to identify the attitude, dominant and the first auxiliary functions.

<table>
<thead>
<tr>
<th>Extroverted sensing</th>
<th>Introverted sensing</th>
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<tr>
<td>Extroverted intuition</td>
<td>Introverted intuition</td>
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<tr>
<td>Extroverted thinking</td>
<td>Introverted thinking</td>
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<tr>
<td>Extroverted feeling</td>
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Figure 1. Jung’s Eight Psychological Types.

Myers and Briggs sought a broader approach to define psychological types by identifying both the preferred ways of perceiving and judging by individuals, in addition to their attitude preference. To accomplish this, Myers and Briggs added a judging (J) and perceiving (P) scale to their instrument. The J and P scores signify
individual's preferences in the outside, or external world. For example, if an individual showed a preference for extroversion, thinking and sensing, how would it be determined which of the two functions was dominant? The preference of the J and P scores signifies this difference. If the score is P, then sensing would be dominant and linked to the extroverted attitude. In the case of introverts, the J and P scores are linked to the auxiliary function.

The introvert's dominant function is inward directed and is not used in adapting to the outside world. The introvert adapts to the outside world through his or her auxiliary function, which is extroverted. Myers and McCaulley (1985) reported that since the instrument is an external stimulus, the reversal of J and P scores for extroverted and introverted types is necessary (p. 13).

The differences between Jung's and Myers-Briggs' designation of types can be shown by illustration. Jung would refer to a type as Extroverted (E) Intuitive (N). This type can be represented by the letters EN. This implies an individual has a dominant, externally directed intuition. Myers-Briggs would define two separate types under this on Jungian type. Since intuition is a perceptive function, and in this example dominant, what is missing from the description is the judging auxiliary function. There are two possibilities: either thinking or feeling. In the Myers-Briggs designation, the letters EN-P represent the attitude and dominant function of the individual. The letter P signifies the dominant characteristic of the perceiving function, intuition in this case. By also measuring for the auxiliary function, the Jungian type EN would be referred to in the Myers-Briggs format as either ENFP
or ENTP. The presentation of all sixteen psychological types identified within the Myers-Briggs schema is located in Table 2.

**Criticism of the MBTI - Beyond Its Reliability and Validity**

The purity of the MBTI test construction, particularly the bi-modalities of the sensing-intuition and thinking-feeling scales, is the major criticism of the instrument. Mendelsohn (1965) labeled the bi-modalities of the sensing-intuition and thinking-feeling scales "not convincing" (p. 321). The MBTI is untimed and in the class of instruments which permit respondents to scrutinize their answer and, often without realizing it, present themselves with personal expectancies and preconceived ideas (Anastasi, 1976). A person completing the instrument must choose an appropriate answer rather than create an answer (sentence completion) therefore, the MBTI avoids what Jackson (1973) described as "various forms of confounded bias and distortion" (p. 783).

Because MBTI's focus is on preferred situations and a person's perceptions, and not upon right or wrong answers, an objective measure is needed. According to Jackson (1973) during the performance, the real objective is concealed; "subjects believe they are being tested in one area whereas the test actually evaluates another area" (p. 783). For instance, the MBTI does not include questions about preferred color through which one could construe personality attitudes, as in Rorschahn (Phillips & Smith, 1953). MBTI type evaluations and descriptions being somewhat superficial
at this stage of the instrument’s development, so Carskadon and Cook (1982) suggested additional research in this area.

Critics (Mendelsohn, 1965; Sundburg, 1965) found that although some of the basic assertions about the MBTI should be explained more clearly, much about the MBTI is useful and potentially valuable. Sundburg (1965) thought that the MBTI would need "to be tried in many contexts, maintaining, as Myers put it, 'a constant search for separate verification and new meaning'" (p.225). Further refinement of the instrument, particularly its experimental items, was suggested by Coan (1978). Carskadon and Cook (1982) discussed the need for further study in the area of type descriptions, their finding indicated that out of 118 subjects, only 27 percent "rated their correct type description as strongly true for them" (p. 93).

While Quenk (1981) indicated that the MBTI scores could be most readily understood as forming hypotheses about probable personality type characteristics of the person taking the MBTI. Critics of the instrument raised reasonable issues but, at the same time, they agreed that the MBTI seems to be at least valid and reliable (and sometimes more so) to similar instruments.

Keirsey and Bates’ Conceptual Framework

Unlike Jung and Myers, Keirsey and Bates (1978) viewed psychological type differences as stemming from a motivational or value base. They contend that each type wanted different things in life, and that the behavior of each of the sixteen types
was consistent with their primary values and motivators. In *Please Understand me,* they provided descriptions of what each personality type valued most and how each type behaved as a mate, leader, worker, student, or teacher. The approach of Keirsey and Bates was in direct contrast to Jung, who asked how each type used his or her mind, as opposed to what each type wanted. Taking this approach enabled Keirsey and Bates to develop further Myers' behavioral descriptions of the sixteen types. The emphasis was on what the different type actually did in various situations.

According to Keirsey-Bates (1978), the sixteen individual personality types derived from four groups, or temperament styles, with each temperament style including four personality types (see Figure 2). People of each of the four temperament styles have their own unique wants, needs, or hungers, which be satisfied every day if they are to maintain their self esteem and sense of well-being.

Besides different interests and values, they also tend to display different patterns of talent and ability. The four temperament styles are called: the sensing-perceiving type (SP); the sensing-judging type (SJ); the intuitive-thinking type (NT); and the intuitive-feeling type (NF). Keirsey and Bates provide a detailed description of each of the four temperament styles as leaders, indicating their leadership strengths, possible weaknesses, characteristic ways of dealing with colleagues, and contributions to a management team.
Keirsey and Bates (1978) discussed four styles of leadership, with four of the sixteen personality types derived from each of the four styles. Two of the styles which they described were also discussed by Isabel Myers, (i.e. the intuitive-thinking type (NT) and the intuitive-feeling type (NF)). While Myers discussed the sensing-thinking type (ST) and the sensing-feeling type (SF), Keirsey and Bates discussed the sensing-perceiving type (SP) and the sensing-judging type (SJ). This study utilized
the Keirsey and Bates' system of grouping the types. The four styles they described are:

The Troubleshooter-Negotiator (SP) hungers for action, freedom, and excitement. This type is a good promotor, negotiator, and excellent at dealing with organizational crisis.

The Traditionalist (SJ) yearns for belonging, being of service, and doing his or her duty. This type excels at running a stable, well-organized organization with a clearly-defined hierarchy and well-enforced standards and procedures.

The Catalyst (NF) searches for identity and integrity -- self actualization, being authentic, and developing one's "true self." This type's strengths lie in keeping the people of an organization nourished, happy, and working at their greatest level of potential.

The Visionary (NT) seeks for competence and power-over-nature. This type is good at designing new models, systems analysis, and critiquing new theories.

Keirsey and Bates contended that a manager's behavior was consistent with his or her Keirsey-Myers type, and that if one knew what type manager was, his/her on-the-job behavior could be predicted.

Studies Related to Jung's Theory of Psychological Types

Research indicates that psychological types may be related to leadership style and overall administrative behavior (Lueder, 1985). They may also be related to
preferred administrative activities (Delunas, 1983); job roles (Church, 1982); selection and training (Wachowiak & Bauer, 1977); problem solving (Lueder, 1984); teaching style (DeNovellis & Lawrence, 1983; Huelman, 1983; Myers & McCaulley, 1985); prior knowledge of subject matter (Cloutier, 1986); achievement of undergraduate agriculture students (Barrett, Sorensen, & Hartung, 1987); and classroom observation data (DeNovellis & Lawrence, 1974). In contrast, other authors have argued that psychological type is not related to leadership effectiveness (Wittstruck, 1986); people's behavior in an experimental situation (Carskadon, 1979); and does not change agents diagnostic information and change tactics (Slocum, Jr., 1978).

Evidence indicates that the Myers-Briggs Type Indicator (MBTI) scores "relate meaningfully to a large number of variables including personality, ability, interest, value, aptitude, performance measures, academic choice, and behavior ratings" (Mendelsohn, 1965, p. 322); mass media preference (Golanty-Koel, 1978; Roberts, 1982); learning styles (Lawrence, 1985; Mogar, 1969; Myers, 1980; McCaulley & Natter, 1974; Bargar & Hoover, 1984); and "how teachers teach, how students learn, how leaders lead, and how people work and communicate" (Foster & Horner, 1990, p. 79).

**Studies Related to Psychological Types in Education Literature**

Jung does not speak directly to education in most of his writing. The application of his theory to education comes mainly from other researchers who have
utilized his conceptual framework in their specific field. Educational research based on the theory of psychological types is usually conducted with a focus on learning and teaching styles.

Learning styles have been described by several authors. Hunt (1982) described learning styles as the conditions under which a student will most likely learn, how a student learns, but not what he or she has learned. Gregoric (1979) described learning styles as the behavior manifested by the student as he adapts to the environment. This, in turn, provides clues to how the student’s mind works, emphasizing external behavior to determine internal mental processing. Dunn and Dunn (1979) identified eighteen elements related to learning styles. Fischer and Fischer (1979) identified ten elements associated with learning styles with the goal of developing teaching techniques which are in congruence with the manifested behavior. Myers-Briggs (1980) provided the description of the MBTI types and discussed the practical implications psychological types have for learning styles. She calls for understanding and the utilization of that understanding in teaching.

According to Wickes (1927; 1966), teachers should understand the attitude (extravert or introvert) and the dominant function (sensing, intuition, thinking, or feeling) so that they have an understanding of their own students’ strengths and weaknesses. Lawrence (1982) proposed matching students’ psychological types with appropriate teaching techniques. His work is directed toward already existing classroom teachers. He suggested that psychological type is related to aspects of teaching and learning. He proposed that practitioners focus on a single function (S,
N, T, or F) or pairing of attitude (E or I) and perception (S or N) preference as a characteristic of learning style. The E-I preference indicates the broad area of students' natural interests with extroverts having "a variety of interest" whereas introverts pursue "fewer interests more deeply" (p. 38).

The sensing-intuition dimension reveals the basic learning style differences; the sensing type is likely to go step-by-step through a new experience while the intuitive works by skips and jumps, following inspiration and looking for patterns. Configurations of commitment and values are evidenced in the thinking-feeling preference and work habits are exhibited through the perceiving-judging scale (MBTI's fourth scale). Lawrence (1982) indicated that the practitioners' first consideration is to design lessons to deal with students' interest or motivation (E-I) and learning styles (S-N) to provide activities that appeal to various psychological types.

Unlike Lawrence, Mogar (1969) incorporated Jung's theory as a sub-system to his larger conceptualization of education. He proposed a theory which involved learning for the "whole person" with its emphasis on problem solving rather than Lawrence's cognitive learning. He included the following points of consideration in his approach:

1. Antecedent condition.
2. The person.
3. The situation.
4. Life stages.
5. Outcomes.
Mogar proposed Jung's theory of psychological types at point (2) the person and the situation (educational institution). He employed the combinations of the perception and judgment functions (ST, NT, SF, and NF) in his learning style approach to focus on the interaction of students and the environment. Lotas (1977, 1978) also utilized these four paired functions on his proposed pedagogical model of Teacher Preference Questionnaire, to assist teachers in identifying their teaching styles.

Lawrence and Mogar take different positions on what components of psychological type should be considered for constructing teaching style techniques and also how psychological type should be developed through learning style techniques. While Lawrence (1980) seeks to develop the dominant function, Mogar (1969) proposed three approaches: (a) the approach for all people, (b) the appropriate approach, also suggested by Lawrence, and (c) the modification of the appropriate approach which attempts to maximize the development of the dominant function, but also engages individuals in the utilization of their less developed function. The latter approach, according to Mogar, would stress the importance of the dominant function, but also seek an overall development of the individual.

Bargar and Hoover (1984) also supported Lawrence's appropriate approach to learning styles and Mogar's modification of the approach. They suggested that students' learning problems should first be addressed through their dominant and/or auxiliary functions, but that improvement in schooling may also mean addressing students' inferior function. Barger and Hoover (1984) stated that "understanding of the role of the inferior function assists in understanding why some activities create
inattentiveness or open resistance from students called upon to engage their inferior functions." They also indicated that cautious development of the inferior function through concrete experience can provide a degree of balance to the dominant function.

While this study is not focused on learning styles, Mogar's, Bargar's, and Hoover's approach is similar to the training and executive development approach that considers the cautious development of the inferior function through concrete experience to provide a degree of balance to the dominant function. Analyzing psychological types into training and development activities where the participants can use all of the functions creates the theoretical possibility of developing the least used function, as well as the least developed attitude.

Kruse (1974) developed a learning model for the mid-life adult; one that focuses on depth education. Based on his own study and experience, he suggested that there was a need for such a conceptual framework.

"...The current trend toward life-long learning is not just for adults returning for degrees; adults seem to be looking for dynamic changes without comprehending that this change must come from within their psyche (Kruse, 1974, p. 9).

Education has been concerned with control and mastery of the environment, not the recognition and understanding of the inner world of the adult human being.

Keirsey and Bates (1978) combined various aspects of perceiving and judging functions in ways different from others already discussed to develop their "temperament styles" for their clinical practice. The four styles are the Dionysian Temperament (sensing-perceiving or SP), the Promethean Temperament (intuitive-
thinking or NT), the Epimethian Temperament (sensing-judging or SJ), and the Apollomian Temperament (intuitive-feeling or NF). The authors described these temperaments in general and also gave their teaching and learning processes. Unfortunately, these behaviors suggested are not grounded in research or observation.

Those who based their learning style approach on Jung's theory of psychological types do not seem to agree on which combination of functions and attitudes to emphasize in constructing their approaches. In this study, the decision to use all of the psychological type variables and the Keirsey and Bates approach of pairing the four functions (SP, NT, SJ, and NF) is both theoretical and practical. There are two main theoretical reasons. The first is that, as discussed previously, Jung (1921) described the attitudes as the carriers of the dominant function. Whereas the attitude determines the direction, the directed characteristics are determined by the dominant function. Jung (1921) states that "when a function habitually predominates, a typical attitude is formed" (p. 417). Hence, to study the attitude isolated from the dominant function is theoretically unsound.

The second reason is that by concentrating on both the dominant and the first auxiliary functions, it is possible to observe the adaption of introverts and extroverts to the external world of assessment center behavior. Since introverts adapt to the outside world with their auxiliary function, the approach of pairing the dominant and the auxiliary functions permits consideration of this phenomenon by not overlooking the dominant function, which is usually hidden.
The practical reason for selecting Keirsey and Bates' model is based on Hoffman and Betkouski's (1981) suggestion that breaking the sixteen types or groups of people into four more basic types facilitates study. Unlike Mogar, Keirsey and Bates, Lawrence's approach for integrating psychological types with learning style was based on single function characteristics or pairing of attitude with perception. This study also used single function (S, N, T, and F) characteristics and attitudes (E and I) separately on Lawrence's assumption that "characteristics of attitude and function use differently are shared by all individuals and none of the characteristics represent constant tendencies" (p. 38).

McCaulley (1976) psychologically typed the 1972 freshman class (n=3362) at the University of Florida and later examined the majors they had selected in 1975. The result demonstrated that some types were significantly over-represented in specific majors when compared with the original population. For instance, the elementary education majors contained more ESFJ and ISFJ types, whereas the arts and science majors were largely INTPs. Those students who were still undecided about their majors were the INFPs.

Damico (1974) and Morgan (1975) both examined the relationship between students' type and academic performance on the Florida 12th grade placement test. The result of the test score discriminated between sensing-intuitive scales. The intuitive (N) side of the scale scored significantly higher. McCaulley and Natter (1974) sampled 500 college students enrolled at the Florida State University Development Research School for use as a base population. These authors
compared psychological type with an array of academic measures. The S-N scale alone showed a large number of significant differences. On 35 measures, the intuitive (N) significantly outperformed the sensing (S).

Delbridge-Parker and Robinson (1989) found a sample of academically gifted junior high school students who were evaluated by MBTI to be very similar to National Merit Scholarship finalists, but were different from high school graduates. In general, the gifted students preferred intuition and thinking, and the introverted intuitive students were over-represented in the sample of the gifted students. McCann et al. (1988) found that college students selected for successful livestock judging teams tend to prefer intuition, sensing, and thinking. Research (Ross, 1966; Reynolds & Hope, 1970; DeKock, 1972; Rowe, 1978) found that interest in science achievement is closely connected to the intuitive (N) preference.

Elliot and Sapp (1988) investigated the relationship between psychological types and learning styles of Urban Southeastern University. The result of the findings show that the extraverted, sensing, and perceiving types of students preferred collaborative style (students who learn most by sharing ideas and talents) and were significantly over-represented. The more traditional types, that is, the introverted intuitive were significantly over-represented among students selecting the participants style (students who take the responsibility for getting the most out of class and participate when told to do so). Those students who preferred dependent style (students who learn only what is required) have important over-representation of sensing and perceiving types.
Barrett (1989) studied the impact of teacher's personality type on classroom environment. Vocational students in public secondary high schools within 150 miles of Lincoln, Nebraska were administered the Classroom Environment Index and the MBTI; and their teachers took the MBTI. Data from the vocational students and their teachers were collected and analyzed. The result of the analysis demonstrated that each teacher's personality type had strongly impacted on determining the classroom environment. E, S, F, and P preferences were linked to a positive classroom environment while I, N, T, and J preferences were less frequently linked to a positive classroom environment.

DeNovellis and Lawrence (1983) conducted systematic observations of the classrooms of middle school teachers as part of a project to validate new teacher training materials. The Florida Climate and Control System (Soar, 1976) and the Coping Analysis Schedule for Educational Setting (Spaulding, 1974) were used. The results indicated that the extraverted judging teachers were twice that of the extraverted perceiving teachers, with introverted perceiving and introverted judging falling in between.

An important piece of research was conducted by Ballard (1978) which dealt with teacher type, student type, and classroom discipline. Ballard (1978) attempted to determine if misconduct could be related to mismatches between teacher type and student type. Specifically, he was interested in knowing if teachers understood children better and hence treated them differently when a student's personality was congruent with the teacher's personality. The result of the student study revealed
that the majority of severe misconduct cases occurred in situations where teacher and student were mismatched.

Roberts (1982) investigated the relationship between personality type and media preference of community college students. College students (n=335) were asked to rank thirteen instructional media: lecture, discussion, small group work, audio recordings, reading texts or articles, programmed instruction, tutorial, symbols (maps, charts, diagrams), pictures or slides, motion pictures or TV, environmental, field trips, or demonstrations or role playing, and laboratory work. The result indicated that different psychological types preferred different learning activities. While intuitive students preferred reading as a medium of instruction, the extroverted, sensing, feeling, perceptive (ESFP) students rejected reading as a preferred method of learning.

Doctoral dissertation (Golanty-Koel, 1977) related the responses of non-academic high school students on a mass media instrument and a values instrument to their N-S scales. The result of the investigation revealed that the sensing students preferred television to reading, whereas the intuitive students preferred reading. Isaac (1963) investigated motivation factors associated with S-N scales of college students. He found that the sensing students favored extrinsic motivation and the intuitives favored intrinsic motivation.

Dittmer (1981) studied the effect of psychological types on classroom values and perceptions of gifted students. The result revealed the greatest separation among the least preferred values, "where personality types seemed to determine
emphatically what people did not like in their classrooms." While the sensing type of people disliked fear, chaos, disorder, and favoritism, the intuitive people disliked alienation, dominance, and dogmatism. These dislikes parallel the preferences and non-preferences described for these functions (Myers, 1962).

The strength of the need may be associated with the strength of the dislike. These dislikes may suggest a relationship to the inferior function (for sensing dominant it would be intuition and vice versa) and even to the shadow aspect of the personality. Being unaware of these relationship and aspects of personality could lead teachers unconsciously to push their students to be like them and thus force them to work in their inferior function or a most disliked manner.

Haber (1980) examined the relationship between psychological types and structured experiences. Two structured experiences were utilized to provide the different "strokes." One set of structured experiences utilized fantasy experience and the other employed nonverbal communication. The result of this finding demonstrated that different psychological types preferred different structured experiences. The extraverted types preferred the two experiences more than did the introverts; the intuitives preferred the two experiences more than the thinking types; and the feeling types preferred the nonverbal communication experience more than the fantasy experience.

Hoffman et al. (1981) researched the relationship between personality types and computer assisted instruction in a self-paced technical training environment. The findings showed that those with primarily sensing perceptions tend to do well. It was
also found that extraverted, intuitive, and perceiving (EN-P) combinations were likely to drop out of instructional programs.

DeNovelles and Lawrence (1974) indicated a relationship between psychological types and teaching style. They found teachers’ behaviors correlating with introversion and sensing were teacher-centered classrooms; that structured activities were related to introversion. The teacher behaviors that correlated with feeling were student-centered classrooms. Disruptive behaviors were related to intuition. They found that the extraverted type is more like to control to a higher extent and extraverted feeling least likely to control activities. Evaluating a self-paced introductory psychology course as a function of psychological type, Carskadon (1981) revealed no significant relationship between self-paced introductory psychology course students and psychological types.

Roberts and Butler (1982) studied the relationship between personality type and reading ability among pre- and in-service teachers. They reported that sensing-intuitive is related to some aspects of reading performance, vocabulary, and comprehension among proficient adult readers. Middleton and Roberts (1981) determined the relationship between psychological types of speech pathologists and their performance on the National Examination in Speech Pathology (NESP). The correlation between MBTI continuous scores and NESP scores revealed a positive relationship between the sensing-intuition variable and performance on the NESP.

Researchers (Von Frange, 1961; Wright, 1966; Lawrence & Denovellis, 1974, Hoffman, 1974, Morales, 1975; Cage, 1975) assessed the personalities of teachers in
education. These investigations provided very consistent results. The majority of teachers in each sample demonstrated a preference for extraversion (51% to 57%), sensing (53% to 74%), feeling (55% to 66%), and judging (63% to 83%).

Keirsey and Bates' (1978) observations of people through the "lens" of Jung's theory of psychological types tells us that two of these temperament styles tend to make up the majority of K-12 public school teachers. These temperament styles are sensing-judgers (SJs) and intuitive-feelers (NFs), but the SJs outnumber the NFs in the teaching field roughly about three to two. Keirsey states that NFs make up about 33% of the teaching population and are likely to stay in the teaching profession for a long time. Only a very few sensing-perceptives (SPs) are staffed in the nation's schools. The intuitive-thinkers (NTs) stay in teaching for just a few years to gain experience to support entry into graduate school. The SPs do not seem to find teaching at any level attractive.

Studies (Briddle & Ellena, 1964; Gage, 1965; Getzels & Jackson, 1963; Rosenshine & Furst, 1972) agreed that teachers' psychological types, that is, the way he or she is and how he or she relates to the student, is perhaps the most significant basis for the learning held by the student. Wright (1966) had school principals select their three most successful teachers and their three least successful teachers. Three out of the four top rate school teachers were found to be ENFJ types. Among the least successful teachers, three out of four were found to be ISFJ.

Wright (1966) recommended the use of personality typing by personnel departments in hiring of school teachers and by colleges during career counseling of
students interested in education. Hoffman and Betkouski (1981) advised researchers using the MBTI to be cautious in making recommendations which could be indiscriminantly applied to the education profession.

Hoffman and Betkouski (1981) found that the majority of pre-service teachers are E, S, F, and J; they did find that pre-service teachers included more NFP types than did in-service teachers (7-9). These results co-relate with those reported by Lawrence (1982). Lawrence provided data concerning 5,363 teachers: E (52%), S (52%), F (63%), and J (63%). His figures indicate a change as one moves to higher levels. Psychological types for 1,378 college and university faculty are I (52%), N (64%), T (50%), and J (63%). This suggests a trend towards introversion and intuition as the teaching moves to the college and university level. McCaulley and Natter (1974) provided similar results regarding K-12 teachers.

An extensive literature review (Carlyn, 1976) regarding elementary and secondary grade teachers' personality types and sex revealed that female teachers are predominantly feeling types and the male teachers are predominantly thinking types. Research (Von Frange, 1961; Story, 1973; Hoffman, 1974; Carlyn, 1976) found that female education majors were more intuitive and feeling in personality type than their male counterparts. Von Frange (1962) also examined type preferences of teachers rated as more effective and found that female extraverted-feeling (EF) and intuitive-feeling (NF) were the highest.

Cohen (1981) reviewed five studies conducted in a school district and indicated in his conclusion that type can be used to predict certain behaviors.
Research (Von Frange, 1969; Wright, 1966; Morrison, 1980) examined the question of whether certain males’ personality types are attracted to school administration. All of these studies found the ESTJ type among the ranks of school administrators, especially principals.

MBTI studies of principals and superintendents (Von Frange, 1961; Wright, 1966; Jensen, 1977; Morrison, 1980; observations by Keirsey & Bates, 1978) found school superintendents to be similar in type to principals, although they sometimes have shown a slightly broader representation of psychological types. Frederick (1974, 1975) found doctoral students to be primarily ESTJ psychological types. Hoffman (1986) in his concise review of research shows educational administrators to be overwhelmingly J, especially ESTJ psychological types.

Foster and Horner (1988) determined that psychological types affect how students learn, how teachers teach, how leaders lead, and how everyone works and communicates. Barrett et al. (1985) indicated that psychological types help to explain how teachers perceive their students; thus use effective teaching strategies with different types of students.

Studies Related to Psychological Types in Management Literature

Keirsey and Bates (1978) described four types of leaders according to their four temperament types. These types of leaders are traditionalist (SJ);
troubleshooter-negotiator (SP); visionary (NT); and catalyst (NF). A number of studies have been conducted that could be significant to leaders.

Myers (1974) reported that the ESTJ often rises to the top position in an organization. She also found that the "clearest vision of the future comes only from an intuitive, the most practical realism comes only from a sensing type, the most analysis only comes from a thinking type" (p. 7).

Research (Campbell & Van Velsor, 1985; Dietl, 1980; Hoy & Hellriege, 1982; Ohsawa, 1981) examined corporate decision-makers and reported the predominance of TJ psychological types (ISTJ, ESTJ, INTJ, and ENTJ) at higher organizational levels. Roach (1986) investigated 298 supervisors, managers, and executives from several large corporations. He concluded that predominance of Ts and Js with Ss and Is most frequently among lower level decision-makers, but Ns and ENs were much more frequent at the higher executive levels.

Lueder (1986) found that ENTJs and a few other psychological types predominated among executive educators who were perceived by independent jurors from a continent-wide poll of nominees to be among the top people in their field. Pollitt (1982) studied 32 presidents, general managers, and heads of large industrial division and reported ENTJs to be prevalent in the study sample. When the MBTI scores were compressed using Keirsey and Bates' (1978) conceptual scheme, the results showed 25% SJ, 9% SPs, 50% NTs, and 16% NFs. Beck (1976) found 31 supervisory nurses to be thinkers, while 66 staff nurses were more on the feeling dimension.
Studies conducted to determine the relationship between psychological types and traits that are possessed by leaders have indicated that MBTI theory predicts how a person will act. Kerin and Slocum (1981) postulated that thinkers would use more objective data in decision making than would feelers who would use subjective data. Forty business administration students were evaluated by the MBTI and were asked to make decisions about selected cases. The result of the analysis found that the thinkers preferred quantitative data and tended to rely on logical structure to clarify situations. The result did not separate types on their handling of subjective data. McKenney and Keen (1974) found that thinkers were more systematic than feelers. Henderson and Nutt (1980) found SFs to adopt solution to problems that involved more risk, while STs needed more analytical precision. Schweiger and Jago (1982) found that sensors encourage more participation in decision making.

Kilman and Thomas (1975) investigated the relationship between the T-F and E-I dimensions and conflict-handling and found that feelers tended to accompany a greater accommodation towards others, and people with high extraversion tended to be more integrative and cooperative. Carne and Kirton (1982) correlated MBTI scores with the Kirton Adaption-Innovation Instrument for management students. The Kirton instrument purports to measure creative capacity. The result of the analysis revealed that intuition and perceiver polls of the S-N and J-P of the MBTI correlated with the creative capacity on the Kirton instrument. The N-P combination indicated a strong link with creative capacity.
Myers (1974) and Robey and Taggart (1984) generalized about psychological types and leadership, recommended that the ideal organization contains people of all types so that there is a balance in perceiving and judging. The intuitive perceiver provides a clear vision of the future which can be analyzed logically by the thinker and practically by the sensing perceiver, while the feeling type skillfully can handle the people in the organization. Myers (1974) emphasized that the opposites are mutually useful and that the combination of type will produce the best management team. Individual managers, administrators, and supervisors can, according to Sample (1984), develop the less preferred function of their psychological type. Learning to use their less preferred process will assist them to be better teachers.

Studies Related to Psychological Types in Agriculture Literature

Myers and McCaulley (1985) found that many individuals in agriculture frequently selected practical and applied "real life" courses which represent thinking "with its step-by-step logical process of reasoning from cause and effect, from premise to conclusion" (p. 107).

Owings and Nelson (1977) assessed the MBTI preferences of 147 Future Farmers of America (FFA) chapter and state officers. The result of the assessment showed ESFS to be predominant among FFA leaders. Rojewski and Holder (1990) found a prevalence of the personality profiles, ESFJ, ISTJ, and ISFJ. Their analysis indicated that, proportionately, vocational education students in teacher training
programs were more extroverted (61%) or less introverted (39%) and more judging (69%) or less perceptive (39%).

Studies (Horner & Barrett, 1985; Barrett, 1985; Thompson, 1987; Bargar, 1989) reported the profiles of adult farmers, university agriculture faculty, university agriculture students, and students. The profiles of these agriculture groups are presented in Table 1.

Table 1. The Most Frequent MBTI Type Profiles of Students and Agriculture Groups.

<table>
<thead>
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<tr>
<td>N=26 f %</td>
<td>N=628 f %</td>
<td>N=25 f %</td>
</tr>
<tr>
<td>ESTP 9 34.6</td>
<td>ISTJ 204 32.5</td>
<td>ISTJ 6 24.0</td>
</tr>
<tr>
<td>ESTJ 6 23.1</td>
<td>ESTJ 168 26.8</td>
<td>ESTP 6 24.0</td>
</tr>
<tr>
<td>ISTJ 4 15.4</td>
<td>ISFJ 121 19.3</td>
<td>ISFJ 5 20.0</td>
</tr>
<tr>
<td>ISTP 4 15.4</td>
<td>ESFJ 73 11.6</td>
<td>ENTP 4 16.0</td>
</tr>
<tr>
<td>ENTP 3 11.5</td>
<td>ISTP 62 9.9</td>
<td>ESTJ 4 16.0</td>
</tr>
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| University Agriculture Students: Barrett (1985) | Agriculture Faculty: Barrett (1985) |
| N=413 f %                                      | N=71 f %                            |
| ISTJ 91 22                                      | ISTJ 16 23                          |
| ESTJ 62 15                                     | INTJ 10 14                          |
| ESTP 54 13                                     | ESTJ 8 11                           |
| ISTP 41 10                                     | ENFJ 8 11                           |
| ISFJ 33 8                                      | INFJ 7 10                           |
Richardson (1990) collected data on Mississippi Cooperative Extension professionals, extension staff development professionals at the National Development Workshop in Denver, Colorado, and extension professionals in workshops conducted in Virginia (1987) and North Carolina (1988 and 1989). The data collected on the extension professionals (N=687) was analyzed and the results indicated that proportionately, extension professionals were more extraverted (51.1%) and less introverted (48.9%) and more sensing (74%) and less intuitive (26%).

The intuition among extension agent groups increased with the age group of 50 and over (50+ years). The age group with the highest magnitude of intuition corresponded to the 30-40 age group at 30.59%. The results also showed that intuition increased for each level of education through doctoral degree, which was 41.07%. The administrators were the most intuitive with 50.85%.

Barrett, Sorenson, and Hartung (1987) found that the achievement of undergraduate agriculture students is related to psychological types. Rojewski and Holder (1990) studied students enrolled in vocational education teacher training programs (N=645) by MBTI temperament preference group and found that the largest temperament preference group was associated with the sensing-judging (traditionalists) (SJ = 58%).
Numerous methods have been utilized by organizations to try to forecast the managerial success of individuals. The use of the assessment center is one of the most effective and popular methods. Assessment centers use a comprehensive, standardized method by which multiple techniques including interviews, tests, situational exercises, and job simulations are used to assess individual employees for a variety of purposes (Thornton & Byham, 1982; Dreher & Sackett, 1983; Moses & Byham, 1977; Moses, 1987; Jaffee & Sefick, 1980; Task Force on Assessment Center Standards, 1979). Assesseees are put through a series of behaviorally-specific, job-related activities and evaluated by trained observers (Jeswald, 1977). The outcome, according to Moses (1977, p. 3), is a "comprehensive, multifaceted view of the individual."

The utilization of multiple assessment procedures was first implemented by German psychologists in the 1930s. The purpose was to aid in the selection of German military officers. The military psychologists decided that paper and pencil tests alone did not provide an overall indication of success as a military officer. Rather than assessing a variety of individual traits, the German psychologists believed that a person needed to be studied as a whole in everyday situations. Abilities and personal characteristics were examined utilizing tasks of a realistic and serious nature rather than abstract psychological tests. The assessment procedure lasted for two to three days. The assessment center activities were designed, implemented, and
evaluated by two military officers, one physician, and three psychologists. The German assessment center program is notable as the first attempt to utilize multiple assessment methods and multiple evaluators to determine complex behaviors (Thornton & Byham, 1982).

The assessment center program of the Germans led to the use of similar assessment methods by the British war offices during World War II. The purpose of these war offices was to identify potential military officers for the British army to recruit. Before 1942, military officers were selected on the basis of a 20-minute interview if the candidate had graduated from a prominent school that offered a military officer's training program. The selection criteria were based on the intuitive judgments of the evaluators on the information they believed was relevant to the military officers' performance.

The British military assessment program made numerous advances over the German efforts because effective performance was more clearly defined. The exercises were better designed because they presented more realistic situations to the candidates. Consequently, the assessment center decisions shifted from the psychologists to military personnel who were more knowledgeable about what it took to succeed as a military officer (Thornton & Byham, 1982).

The multiple assessment center program for selection and placement was first introduced in the U.S. in 1943 by the Office of Strategic Services (OSS) which was then called Station "S" and located in Fairfax, Virginia. The goal of the OSS management program was to evaluate the personalities of candidates for potential
positions in the OSS. These positions included those of saboteurs, secret intelligence agents, and propaganda experts. Candidates were evaluated in various situations including interviews, simulations, role-playing, and pencil and paper tests. Candidates had to demonstrate survival skills, foreign language skills, and impersonation skills. For example, each of the OSS assessment center participants assumed a false name and made up a story about his or her life and work. The OSS assessment center evaluators would try to trick the candidates into revealing themselves. The OSS assessment center activities took three days of assessment which included a situational test of the person's skills making up a story and persisting in maintaining the story. Many of the situational exercises were designed to simulate actual job situations (Priestly, 1982). The OSS assessment center marked a significant shift away from paper and pencil tests as a single predictor of actual job performance in the U.S. (Thornton & Byham, 1982).

The private sector utilization of assessment centers began in 1956 when American Telephone and Telegraph (AT&T) began its longitudinal study on management progress. The longitudinal study was designed to understand what motivational, attitudinal, and cognitive characteristics were important to the career progress of new employees from the time they were hired into the Bell System and as they moved into middle and upper management levels in the Bell System (Bray, Campbell, & Grant, 1974). Candidates were evaluated using assessment center techniques on 25 variables which were later synthesized into seven major areas. The candidates were evaluated by assessment center methods and then their career at
Bell Systems was monitored with their assessment center information. The assessment center results were not given to the participants, their supervisors, or company managers, in order to minimize the effect of assessment bias on the participants' progress in the company. The assessment data were so predictive of future success that Moses (1987) estimated that over 5,000 organizations utilize assessment center procedures. In addition, Casio (1982) declared that the AT&T longitudinal management progress study is the largest and more comprehensive research of managerial career development ever undertaken in the business sector.

A literature review by Klimoski and Strickland (1977) revealed assessment center ratings to be consistently valid predictors of future promotions. Also, a literature review by Moses, Cohen, and Byham (1974) found that assessment center ratings were consistently related to future promotions, but not highly predictive of job performance. A more recent study by Turnage and Muchinsky (1984) also found that assessment center evaluations could predict future promotions but were not related to job performance. Although many organizations establish assessment for development purposes, there has been no published research on the importance of assessment centers for employee development.

However, Yukl (1984) questioned the usefulness of assessment centers as predictors of managerial effectiveness. An assessment center, according to Yukl (1984) is more likely to predict impression management rather than managers who have greater competence in doing the job. He believed that impression managers
are more likely to advance faster than other managers who have greater competence in doing the current job, but who are not as ambitious in "selling themselves."

The utilization of assessment centers for the purpose of selection and personnel development in the business sector is on the rise. The increase in assessment center utilization is reflected in the publication of the Standards and Ethical Considerations for Assessment Center Operations (Task Force on Assessment Center Standards, 1979). Numerous published articles (Finkle, 1976; Huck, 1977; Klimoski & Strickland, 1977; Klimoski & Brickner, 1987; Smith & Clark, 1987) support the use of assessment centers for selection and personnel development. Many books (Moses, 1987; Dreher & Sackett, 1983; Ulschak, 1983; Priestly, 1982) have included chapters on the assessment center idea indicating their increasing support for the assessment center concept and the federal court's opinion (Byham, 1980a) tends to strengthen such support.

The growth and acceptance of the assessment center concept is attributed to its scientific research and development; many organizational climates fostering its research and development; many scientists and businesses facilitating the communication of the concept; and the availability of manuals, techniques, and simulations which enable small businesses to adopt the procedure.

Huck (1973) reported a study conducted by Michigan Bell which provided the definitive data regarding reliability of the total assessment process. The Michigan Bell study is one of the few studies which deals with the stability of assesees over time. The study investigated the relationship between two multi-assessment
programs. The correlation between overall performance in the two programs was substantial for the total sample (.73) as well as for each of the sub-groups: men (.77), women (.70), blacks (.68), and whites (.73). Statistical tests did not support differences among the sub-groups.

Criterion-related validity studies provide the knowledge base upon which assessment center procedure rests (Huck, 1977; Klimoski & Strickland, 1977). However, Norton (1977) suggested that assessment center strategy, after its content validation, can be utilized to select employees for positions which are managerial in content, even in the absence of an empirical validity study. Other scholars who share this view argued that one of the reasons for the popularity of the assessment center is the extent to which the procedure lends itself to validation based on its content-oriented procedures (Byham, 1977, 1980b; Jaffee & Sefick, 1980). Wernimont and Campbell (1968) emphasized that when sampling current levels of performance, it is appropriate to defend the selection method on the basis of content validity. If selection is utilized as a predictor of future behavioral tendencies, than the current validity approach is not appropriate.

Kelley and Wendel (1983) reported that the assessment center has been utilized by business, industry, government agencies, and education in personnel selection and training. The assessment center is now being utilized in education because of the need for quality education which prompts the related concern for selection, training, and development.
The OCES assessment center was developed as a part of a continuing effort to develop and maintain high quality supervisory staff to provide balance and assure effective, timely programs (OCES, 1983). Instead of examining the measure of leadership ability such as intelligence test scores, assessment center simulations provide actual observable samples of job-specific behaviors derived from job analyses. The validity of the assessment center, according to Byham (1977), depends on accurate observation of situationally-specific behavioral responses of the assessees. The assessment center procedure provides interesting, yet time-consuming, methods of studying leadership ability and effectiveness. Popular theorists have rejected the structured approaches and have studied leaders in their environment (Hersey & Blanchard, 1969). However, the assessment center method seemed to have produced a valid and reliable picture.

Moses and Byham (1977) found that assessment processes tended to produce similar validities for males and females. Absence of published research related to women and assessment centers was obvious in the literature. This suggests that until recently, women were under-represented in managerial jobs (Larwood & Wood, 1977). Moses and Boehn (1975) declared that assessment center performance rating criteria was significantly related to managerial progress in management and the gender success was similar. Substantial similarities were reported between specific dimension ratings and progress of women and men. While Kwarteng (1986) found low relationship between gender and assessment center performance. Boone (1988) reported negligible relationship between gender and assessment center performance.
This would suggest that male and female extension agents would not be expected to differ in their assessment center performance rating.

Decremental theory of aging suggested that abilities declined as employees grew older (Botwinick, 1978; Welford, 1965). On the contrary, Giniger et al. (1983) found no support for the decremental theory. Literature reviewed (Thornton & Byham, 1982) found no studies that revealed a strong relationship between age and assessment center performance criteria. Lack of correlation between age and assessment center performance was supported in other studies (Hall, 1976; Parker, 1963). However, research (Burrough, Rollings, & Hopkins, 1973; Neidig et al., 1978) reported moderate and low negative correlation between age and performance. Kwarteng (1986) reported low relationship between age and assessment center performance. Boone (1988) found negligible relationship between age and assessment center performance. The literature reviewed on the relationship between age and assessment center performance found several inconsistencies. On the other hand, the decremental theory of aging would indicate that younger extension agents would obtain higher assessment center ratings than older extension agents.

In an investigation of the relationship between experience and performance, Arvey and McGowen (1980, p. 29) proposed the following: (1) more experience would reflect better performance and (2) recent experience was more valuable than older experience. On the other hand, Giniger (1983) found that experience rather than the age of workers determined performance. Both Kwarteng (1986) and Boone (1988) reported low relationships between years of experience and assessment center
performance. This would suggest that a more experienced extension agent would obtain a higher rating on assessment center performance than a less experienced extension agent.

Kwarteng (1986) and Boone (1988) found negligible relationships between the major program area reported as agriculture, the major program area reported as 4-H and youth programs, and assessment center performance. While Kwarteng (1986) reported negligible correlations between the major program area reported as home economics and assessment center performance, Boone (1988) found low relationship between major program area reported as home economics and assessment center performance. Both Kwarteng (1986) and Boone (1988) reported low correlation between the major program area reported as administration and assessment center performance. In addition, Boone (1988) found low relationship between major program reported as CNRD and assessment center performance.

Several inconsistencies have been revealed in the relationships between the major program area and assessment center performance. However, Giniger (1983) and Fieldler's (1970) conclusions, that experience correlated with leadership performance, would suggest that extension agents in certain program areas would perform better at assessment centers.
Summary

Tying together Jung’s Theory of Psychological Types, clarified by Myers, demographic variables to the assessment center situation and process may represent a change in organizational formative evaluation. Studies related to psychological types literature, education literature, management literature, agricultural literature, and assessment center literature were reviewed. Based on this review, the present study attempts to determine the relationships between psychological types and assessment center performance of Ohio Cooperative Extension Service Agents.

The explanatory variables will be the psychological types preference score analyzed through the MBTI: attitude preference score, perception preference score, judgment preference score, and orientation preference score. The criterion variable will be the assessment center performance determined by trained evaluators in assessment center procedures.

Given that the goals of assessment center evaluation and MBTI assessment are similar and that psychological makeup is being assessed by both, this investigator expected psychological type variables analyzed through the MBTI/Keirsey and Bates temperament to be related to assessment center performance of OCES extension agents. This investigator also expected the extroverts (E), intuitive (N), thinking (T), and judging (J) types to out-perform the introverts (I), sensing (S), feeling, and perceiving types. This investigator also expected inter-relationships among the
demographic variables, assessment center performance, and psychological type variables.

The model reflecting this study is presented in Figure 3. The proposed model was derived from the related literature review and represents the most logical arrangement of the relationships among the variables.

Figure 3. Model of the Relationships Between Psychological Types and Assessment Center Performance of Ohio Cooperative Extension Service Agents.
Chapter III

Methodology

The purpose of this study is to describe the relationship between psychological types and assessment center performance. The research design, population, instruments, instrument’s reliability and validity, data collection procedures, and data analysis will be described in this section.

Research Design

This study employs ex post facto research. This method is widely used in behavioral sciences because many social problems do not lend themselves to experimental inquiry (Kerlinger, 1973, 1976). In ex post facto research, the independent variable is not manipulated. The researcher begins with the measurement of the dependent variable. The independent variable has already occurred, and the researcher has not been monitoring it’s occurrence. Antecedent
variables, that is, variables that precede the independent and the dependent variables were used in this study to "weed out" plausible rival explanations. Absence of plausible rival explanations of the relationship between psychological type variables and assessment center performance strengthens the research design (Campbell & Stanley, 1967).

The independent variable was the psychological types of extension agents. The extension agents' psychological types included two attitudes (extraversion and introversion); two perception functions (sensing and intuition); two judgment functions (thinking and feeling); and two orientation functions (perceiving and judging). The MBTI was used to assess the psychological types of the extension agents.

The extraneous variables were the extension agents' demographics. The demographic variables included the extension agents' gender, age, experience, degree (BS, MS, and PhD), major program area (agriculture, home economics, 4-H and youth, and community and natural resources), and year attended the assessment center (1985, 1986, 1987, 1988, and 1990). A researcher-designed demographic questionnaire (Appendix C) was used to survey the extension agents' demographic variables.

The dependent variable was the extension agents' assessment center performance. The assessment center performance was established by evaluators trained in assessment center procedures. The evaluators assessed the assessment center participants in simulated job situation activities derived from a job analysis.
using a variety of job sampling techniques (Thornton & Byham, 1982). The assessment center performance was the consequence of behaviors determined by trained evaluators according to assessment center procedures. Unobtrusive measures were used to survey the agents' assessment center performance.

**Population**

The population of this study was the 135 OCES extension agents who attended the assessment center between April 1985 and May 1990 who were employed as of November, 1990. Seventy-five (75) extension agents who had attended the assessment center have either resigned from the OCES or retired.

An updated list of 135 extension agents who had attended the assessment center was obtained from the OCES. A census of the currently employed Extension Agents who attended the assessment center was conducted. The assessment center accepted only the Extension Agents selected by their district directors based upon his or her recommendation to participate in the assessment center. Participants were allowed to select the time they would attend the assessment center which was compatible with their county schedules.
Instruments

Three sets of instruments were utilized to gather data for this study. The MBTI was used to evaluate the psychological types of selected OCES Extension Agents. A researcher-designed demographic questionnaire was used to gather data on the agents' personalological variables. Assessment center performance was an established consequence of the extension agents' involvement in the OCES assessment center activities.

MBTI (Instrument) Selection

Two personality indicators have been developed independently to assess the Jung (1921, 1923) theory of psychological type, the MBTI and the Gray-Wheelwright psychological type questionnaire (Gray-Wheelwright, 1946). Both instruments have the same purpose, to measure Jung's theory of psychological type. However, the Gray-Wheelwright indicator does not have a judging-perceiving scale (JP) (Stricker and Ross, 1964). The split-half reliabilities on the Gray-Wheelwright scales are lower than for MBTI. Huber (1983) found the MBTI more effective than other personality inventories in measuring differences between individuals, and reported that it is an appropriate instrument for both understanding and communicating with others. Carlson and Levy (1973) compared the MBTI and the Gray-Wheelwright
psychological type indicator, which also assesses Jungian framework, and found that the MBTI psychometric properties are more firmly established.

The MBTI was chosen over the Strong Vocational Interest Blank (SVIB) because SVIB was found to be too narrow in scope, dealing with vocational interest only. The MBTI was preferred over the Allport-Vernon-Lindzy Study of Values (A-V-LSV) because the A-V-LSV has scales which are not broadly applicable to research. The MBTI was chosen over all other personality indicators, including the Edwards Personality Preference Scale and the Personality Research Inventory because the MBTI is more widely used in many academic fields, with "other factors being nearly equal." Numerous studies contribute and encourage research valuable to the development of the MBTI. The Center for Application of Psychological Type (CAPT) continually updates descriptive specificity of the MBTI and its statistics.

The MBTI's ease of administration, hand scoring, and optional computerized scoring service together with possible additional scale and type description refinement to be developed in the future (McCure, 1985), offers advantages over other personality assessment. The MBTI appears to have a legitimate theoretical framework and to be a useful resource in understanding and training individuals (McCure, 1985). For these reasons it was felt that MBTI will better accomplish the purpose of this study and will be available to other scientists who may desire to undertake further research in the area of training and development of individuals.
The Myers-Briggs Type Indicator

The MBTI standardized form G (Appendix C) was used in this study to measure the personality preferences of OCES extension personnel. The MBTI form G is a 126 item self-reporting pencil and paper instrument designed for normal adults. A person completing the instrument must choose an appropriate answer rather than create an answer. The form G, which is the short form, can be completed within 45 minutes. The MBTI is a measurable framework which Myers and Briggs (1962) developed to measure Jung's (1921) theory of psychological type. The instrument has four scales, with continuous scores for sub-scales of extraversion-introversion (E-I), sensing-intuiting (S-N), thinking-feeling (T-F), and judging-perceiving (J-P) respectively. The first three scales are based on Jung's (1921) theory of psychological type. Myers (1962) introduced the fourth scale to permit the identification of the dominant preference between S-N and T-F variables. The two attitudes (E and I) and the four functions (S, N, T, and F) as well as the two preferences of the functions (J and P) combine into 16 possible Jungian psychological types of people. These people can be identified by MBTI. The concept underlying MBTI is that people have preferences for either of the functions on each sub-scale.
Scoring of the MBTI is based on the assumption that two attitudes, extroversion and introversion (E and I); four mental functions, sensing (S), intuition (N), thinking (T), and feeling (F); and two orientations, perceiving (P) and judging (J) interact to form 16 personality types or groups of people.

People responding to the MBTI make choices on four preferences indicated by eight letters: E or I; S or N; T or F; and I or P. The MBTI also assumes that every person utilizes all eight qualities described by these letters, but people prefer one letter of each pair more than they prefer its opposite (Myers, 1962). Each of the 16 personality types has its own configuration, showing which of the four mental functions is most preferred, the second preferred, the third preferred, and the least preferred.

The MBTI determines the preferred attitude (extraversion or introversion), the preferred perception function (sensing or intuition), the preferred judgment function (thinking or feeling), and the preferred orientation (perceiving or judging) of all the 16 groups of people. The MBTI extroversion-introversion (E-I) subscales and the judging-perceiving (J-P) subscales are used to determine which of the mental functions in the profile is extraverted. This information is then used to determine whether one's personality is dominated by either the perception or the judgment function.
The extroversion-introversion (E-I) subscales of the MBTI are used to determine whether a person's preferred mental function is extroverted or introverted. For example, if a person indicates an *extraversion preference score* on the E-I subscales with a *perceiving preference score* on J-P subscales, then his or her perception function (sensing or intuition) is dominant and extroverted. A person with an introversion score on the E-I subscales with a P score on the J-P subscales indicates the dominance of the judgment function (thinking or feeling). In this latter example, either thinking or feeling will be the dominant function, depending on the individual's score on the T-F scales. On the other hand, the perception function (sensing or intuition) will assume an auxiliary role in an extraverted attitude.

The extrovert's dominant function is visible to an observer because extraversion is apparent. However, with introverts, the score on the perceiving-judging scale has to be reversed for the dominant function to be identified. The opposite score has to be obtained for the introverts in the perceiving-judging scales because the MBTI scale measures only the "openly revealed" attitude and the preferred attitudes of introversion is introverted.

Extraverted intuitive people with feeling (ENFP), for example, indicated extraverted attitude on the E-I subscales and perceptive on the J-P subscales. An examination of the ENFP revealed that P is preferred over J on the J-P subscales. Subsequent examination of ENFP revealed that only N belongs to the P scale, that is, S-N subscales, therefore N is dominant and extraverted. Sensing on the S-N subscales is opposite to the dominant function, N, then it is the inferior function. It
follows that F is the second preferred function as shown on the ENFP personality configuration. T is the third preferred function because it is the function opposite to the second preferred function. It is interesting to note, however, that N and F are "openly revealed" by inspection of the ENFP configuration because E is showing in the ENFP personality configuration. The ENFP configuration shows the dominant function of N which is extroverted, whereas the auxiliary and inferior functions are introverted.

Conversely, introverted feeling people with intuition (INFJ), cited introverted attitude on the E-I subscales and perceptive on the J-P subscales. An inspection of the INFP profile shows that perceptive (P) is preferred over judging (J) on the J-P subscales. Ensuing examination of the INFP revealed that intuition (N) belongs to the P scale, that is, subscales S-N. Judging (J) scales have to be used to identify the introverted dominant function because the introverted dominant function is hidden and the MBTI only measures the apparent mental functions and is introverted since the MBTI only measures profiles that are extraverted (apparent). Therefore, the perceptive score revealed on the INFP profile had to be reversed to J to identify the dominant function. Additional examination of the INFP revealed that only F shows on the J scale, that is, T-F subscales, therefore, F is the dominant mental function. For introverted profiles, the extraverted function is auxiliary and the introverted function is dominant.

To score the MBTI, points are obtained by summing the weighted values of E, S, I, N, T, F, J, and P. The scores produced by the instrument are supposed to
indicate the direction of the preferences and thereby identify the dominant and auxiliary functions and the direction of interest. The responses are scored to generate psychological type.

The scoring of the instrument includes the summing of total points for each aspect of the four indices and determining the direction of the preference. Two scores are then provided -- the preference score and the continuous score. The preference score gives the letter of each preference and a numerical score indicating the strength of the preference (usually a range from 1 to 61). An example for an ESFJ could be: E - 25; S - 13; F - 23; J - 25. The scores below 20 are considered to exhibit a less confident or weaker preference.

The continuous score is provided for use in studies in which the investigator "assumes the distribution of preference scores is continuous and linear..." (McCaulley, 1977, p. 25). The midpoint is set at 100 and the preference score is subtracted from 100 for E, S, T, and J, or added to 100 for I, N, F, and P. (For example, E 15 has a continuous score of 85, while I 15 has a continuous score of 115.) Continuous scores are often used to compare the four MBTI indices with scales of other personality tests (Myers, 1962).

The MBTI has 16 personality types because of the combinations of the four indices. These go beyond the eight attitude functions described by Jung (see Table 2). In describing these eight combinations, Jung does not include the auxiliary function in the pattern. The auxiliary function is different in every respect from the
Table 2. Jung's 8 Psychological Types Combined with Myer's Orientation of Perceiving and Judging to Form 16 Types in the MBTI.

<table>
<thead>
<tr>
<th>Eight Jungian Types</th>
<th>Sixteen MBTI Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraverted (E) and Sensing (S) dominant</td>
<td><strong>Perception (P)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Dominant</strong></td>
</tr>
<tr>
<td></td>
<td>ESTP</td>
</tr>
<tr>
<td></td>
<td>ESFP</td>
</tr>
<tr>
<td>Introverted (I) and Sensing (S) dominant</td>
<td>IS-J</td>
</tr>
<tr>
<td></td>
<td>ISTJ</td>
</tr>
<tr>
<td>Extraverted (E) and Intuitive (N) dominant</td>
<td><strong>Judgment (J)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Dominant</strong></td>
</tr>
<tr>
<td></td>
<td>ENP</td>
</tr>
<tr>
<td></td>
<td>ENFP</td>
</tr>
<tr>
<td>Introverted (I) and Intuitive (N) dominant</td>
<td>IN-J</td>
</tr>
<tr>
<td></td>
<td>INTJ</td>
</tr>
<tr>
<td>Extraverted (E) and Thinking (T) dominant</td>
<td>E-TJ</td>
</tr>
<tr>
<td></td>
<td>ESTJ</td>
</tr>
<tr>
<td>Introverted (I) and Thinking (T) dominant</td>
<td>I-TP</td>
</tr>
<tr>
<td></td>
<td>INTP</td>
</tr>
<tr>
<td>Extraverted (E) and Feeling (F) dominant</td>
<td>E-FJ</td>
</tr>
<tr>
<td></td>
<td>ESFJ</td>
</tr>
<tr>
<td>Introverted (I) and Feeling (F) dominant</td>
<td>I-FP</td>
</tr>
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<td></td>
<td>ISFP</td>
</tr>
</tbody>
</table>
dominant function; it moves in the opposite direction (E or I) and it is of the other dimension (J or P) (McCaulley, 1981; Myers, 1980; Jung, 1923).

The four scales or indices are dichotomous by definition and are relatively independent. There is a slight correlation between the S-N and the J-P scales. The sensing types tend also to be judging (S-J) and the intuitives to be perceiving (N-P) (Stricker & Ross, 1963; Webb, 1964).

**Interpretation of MBTI Scores**

*Interpreting Levels of Preference*

The preference scores show not the intensity but the *direction* of a preference. Low preference scores, according to Myers (1962, p. 58), mean that the respondent has a "split vote" between the opposite poles of the preference. When the respondent *must* make a choice, what he/she prefers is made clearer, as indicated by the larger score. People who report clear preferences often follow their preferences and so they tend to develop the skills that correspond to those preferences. People who report clear preferences will also tend to develop characteristics (traits and habits) that the utilization of those skills and habits would bring about. But in any individual, the sequence can be, and sometimes is, interrupted.

*Very Clear Preference* (41 or more, 31 or more in the case of feeling) suggests that the respondent's preference is "very clear." A very clear preference suggests that
the respondent reported that they tend to retain the preference consistently and, therefore, also retain the attitudes and skills they develop from their utilization of these preferences.

**Clear Preferences** (21 - 39, 29 or more for F). When one's preferences score runs 21-39 (29 or more for F) "there is a reasonable probability that the respondent "retains" and acts on the reported preference" (Myers, p. 58).

**Moderate Preferences** (11 - 19). When preference scores run 11-19 it indicates that the respondents' preferences are moderate. A moderate preference indicates that "the respondents may still most often agree with the description of the reported preferences" (Myers, 1962, p. 58).

**Slight Preferences** (1 - 19). A preference score of 1 through 19 indicates that the respondent's preferences is slight and could easily go one way or the other. Slight preference shows that the respondents are reluctant to choose one or the other preference. Respondents often think the low preference score indicates an ability to use either preference but low scores are really more of an indication of tension between the pole of the low preference. "For example, low TF preference scores are often associated with reports of trouble in knowing whether to follow my head or my heart" (Myers, 1962, p. 58). "Sometimes respondents interpret low preference scores as advantageous, interpreting the scores to suggest they have a good command of both preferences," according to Myers (1962, p. 58), "Low scores are more often a reflection of tension between the opposite poles of the preference than an indication of equal excellence."
Reliability of the MBTI

The reliability of the MBTI is supported by a number of studies which examined data on both the categorical and the continuous scores received from the instrument. The reliability studies on the categorical and the continuous scores are presented below.

**Categorical Preference Score**

A summary of reliability studies of the MBTI with adult samples is presented below, and types of reliability are examined: measures of internal consistency and stability.

1. *Internal consistency of the categorical preference score.* Hoffman (1974), Myers (1962), and Webb (1964) reported phi coefficients ranging from moderate to high for all the sub-scales in the MBTI, .43 to .75 for thinking and feeling. Carlyn (1977) felt that these reliability coefficients are satisfactory estimates.

2. *Stability of the categorical preference scores.* Test-retest reliability coefficients have been estimated based on percent of agreement of types over time intervals from 5 weeks to 6 years. These coefficients run from .69 to .92 across all scales. Test-retest studies involving college students (Levy, Murphy, & Carlson, 1972; Stalcup, 1968; Ross, 1964a) found the proportion of agreement between the original and the retested group to be statistically higher than would be expected by chance. The college students maintained stable scores over a period of time, with a majority
of the students displaying either complete stability or a shift in one of the four variables. Wright's (1966) test-retest on elementary school teachers was even more impressive. When the elementary school teachers were retested six years after they were tested with MBTI, 61 percent of the teachers remained in the same category on all four scales.

**Continuous Preference Scores**

1. *Internal consistency of the continuous preference scores.* Myers (1962) used a split-half method involving Pearson Product Moment Correlations, Webb (1964) utilized a split-half method similar to Myer's procedure, and Stricker and Ross (1964) used Cronbach's Alpha. The three methods produced similar results. The overall reliability coefficients for the four scales ranged from moderate to high. Split-half reliability coefficients calculated on the continuous scores run between .80 and .92 across all four scales for the age group 15 through 60+ years (Myers & McCaulley, 1985).

2. *Stability of the continuous preference scores.* Test-retest correlations computed from two retested studies (Levy et al., 1972; Stricker & Ross, 1962) both achieved significance at the .01 level. Female students' scores were more stable over a period of time than those of the male subjects.
Validity of the MBTI

The validity of the MBTI is dependent on how well the indicator measures what it purported to measure: Jung's conceptual framework of psychological types. Three types of validity are examined below: content validity, predictive validity, and construct validity.

Content Validity of the MBTI

Selected items on the MBTI were based on the empirical evidence that items separate people with opposite preferences. Stricker and Ross (1962) examined the item content on the S-N and T-F sub-scales of the MBTI and concluded that items on those scales corresponded to their conceptual definitions, but E-I and J-P sub-scales measure something else from the dimensions theorized by Myers (MBTI manual). Carlyn (1977) found the face validity of the MBTI to be consistent with the contents of Jung's framework. On one type of content validity Bradway (1964) found 43% agreement on all the three scales when the self-typing and MBTI-typing were compared on Jungian analysis. On an additional type of content validity, Bradway (1964) also found 54% identical classification on all the three scales when MBTI scores were compared to scores received on Gray-Wheelwright questionnaire (Gray & Wheelwright, 1946). Stricker and Ross (1946b) compared interval scores received on the MBTI and the Wheelwright questionnaire, and reported moderate to high correlation on the three dimensions.
Predictive Validity of the MBTI

Regression equation derivation (Goldschid, 1967) to forecast college major of two samples of undergraduates found that MBTI had moderate predictive validity. Conary (1966) predicted that a certain personality type in his sample of entering freshman would be more likely than other types to receive good grades and to make specific curricula choices during freshman years. The predictive validity was substantial. Stricker et al. (1965) found that a contingency measure combining all the four scales had greater predictive validity than did one individual scale. Based on MBTI scores, Saunders (1957) forecasted the relative likelihood that Rockefeller Theological Fellows would adjust to their roles as divinity students. These studies seem to suggest that MBTI has moderate predicative validity.

Construct Validity of the MBTI

Saunders (1960) used factor analysis to relate MBTI continuous scores to the Allport-Vernon-Lindzy Study of Values (AVL), an instrument based on Spranger's framework of type. The result of the factor analysis displayed "simple structure" and both instruments appeared to be measuring the same construct. Madison et al. (1963) and Ross (1966) investigated the relationship between the constructs measured by the MBTI and constructs measured by other tests. In all the studies, according to Carlyn (1977, p. 469), the four MBTI dimensions tended to have "substantial loading on different factors," lending support to Myers-Briggs' (1962) framework of four dimensional "interlocking structure of personality." Cohen, Cohen,
and Cross (1981) supported the construct validity of the extraversion-introversion, sensing-intuiting, and thinking-feeling scales but not of the judging-perceiving scale.

**Summary of Reliability and Validity of MBTI**

By the late 1970s, increased effort to strengthen the quality of the MBTI data had led to replicated studies, such as the test-retest reliabilities research (McCarley & Carskadon, 1983) and the validation of MBTI type descriptions (Carskadon & Cook, 1982). Reliability data from five studies quoted thinking-feeling dimension coefficients to range from .75 to .94 for gifted samples. Recent analysis supports the MBTI. Carskadon (1977) reported the test-retest reliability of MBTI scores. Carlyn (1977) supported the validity of the MBTI in an assessment of the instrument. Nisbet, Ruble, and Schurr (1982) found the MBTI to be better than traditional predictors of high-risk college freshmen. Carne and Kriton (1982) found the MBTI more effective in measuring creativity capacity when compared to the Kriton Adoptive Instrument. Huber (1983) and Blaylock and Rees (1984) added support to the validity and usefulness of the MBTI. Pinkey (1983) explained the appropriateness of the MBTI as a career counseling device. Research in psychological types, published since 1978, focused on research about the MBTI and Jungian psychological framework issues. In general, research indicates that MBTI reliability coefficients range from .74 to .89.
Demographic Questionnaire

The demographic questionnaire was designed by the researcher. The demographic questionnaire (Appendix C) contained items which respondents were asked to indicate their sex, age, degree, major program area, and years of work experience.

Reliability and Validity of Demographic Questionnaire

The face validity of the demographic questionnaire was established in two ways. First, the demographic questionnaire was examined by a panel of experts (Appendix B) who determined that the instrument was content valid. Second, a pilot test was conducted using 15 graduate students in the Department of Agricultural Education who have similar characteristics as the OCES extension agents involved in this study. The students selected are those who were extension agents prior to their enrollment in the Department of Agricultural Education.

Assessment Center Performance

Extension agents who attended the assessment center were nominated to attend by their District Director. Usually, a small group of 6 to 12 was evaluated at one time. During the course of the assessment, usually two to three days, the agents participate in a variety of activities designed to allow them to demonstrate skills and
abilities that were essential for successful on-the-job performance. The assessment center exercises are:

1. Non-assigned role group discussion. The entire group of participants participated in a discussion and made recommendations on how to resolve a problem they had been presented.

2. Assigned role group discussion. Each participant was assigned a candidate for a job opening and must try to persuade the other participants to vote for his/her candidate.

3. In-basket. The participant dealt with a packet of letters, memos, phone messages, etc. which a manager might find in his/her "in-basket".

4. Interview simulation. The participant took the role of a manager giving a performance appraisal to a subordinate.

5. Written case study. The participant was given a written description of a problem and then prepared a written report on how he/she would handle the problem.

6. Fact-finding. The participant asked a role-player questions about a problem which supposedly developed in the office and then gave an oral report on how he/she would deal with the situation.

7. Background interview. The evaluators interviewed the participants and determined their communication skills and abilities to work with committees.
The evaluators rated the extension agents who attended the assessment center using their behavior on the aforementioned exercises to determine their ability on 16 dimensions. The 16 dimensions evaluated are oral communication, leadership/delegation/persuasiveness, sensitivity, initiative, planning/organizing, development of coworkers, judgment/decision-making/decisiveness, behavioral flexibility/adaptability, assertiveness, organizational sensitivity, objectivity, written communication, perception, management control, collaborativeness, and evaluation.

These dimensions were developed based on a job analysis of managerial jobs. A committee of 21 people who were familiar with managerial jobs assisted with the job analysis. For each of the dimensions, a definition was developed by the job analysis committee with the assistance of an assessment center consultant. The 16 dimensions on which the assessment center participants were evaluated and the definitions which were used by the evaluators are:

1. Oral communication - The extent to which one can give an oral presentation and communicate on a one-to-one basis by listening and responding.

2. Leadership/delegation/persuasiveness - The ability to influence others to move toward the attainment of a specific goal as efficiently as possible.

3. Sensitivity - The ability to respond/react to a problem considering the feelings, emotions, and needs of others.
4. Initiative - The capacity to see courses of action and the ability to begin actions without stimulation and support from others.

5. Planning/organizing - The process of establishing a course of action for self and/or others to accomplish a specific goal.

6. Development of coworkers - The extent to which one develops and/or assists in developing the skills and competencies of coworkers through training and development activities, counseling, and delegating the duties related to current and future jobs.

7. Judgment/decision-making/decisiveness - The process of identifying problems, securing relevant information, developing alternative courses of action, and the readiness of making a decision from the information gathered.

8. Behavioral flexibility/adaptability - The extent to which one’s behavior is flexible, adaptable, and effective when confronted with different situations, circumstances, and personalities.

9. Assertiveness - The degree to which one can effectively state his/her ideas positively and forcefully without being hostile or destructive.

10. Organizational sensitivity - The degree of knowledge or awareness one has of formal and informal organizational policies and procedures.

11. Objectivity - The extent to which one can analyze, judge, and make a fair decision about a person or situation regardless of one’s own attitudes or feelings.
12. Written communication - The extent to which one can express effectively his/her ideas in writing.

13. Perception - The ability to identify or recognize a problem or potential problem.

14. Management control - The extent to which one makes the most efficient use of all resources (personnel, office, committees, etc.) to obtain effective outcomes.

15. Collaborativeness - The degree to which one is willing to work cooperatively with others in making decisions.

16. Evaluation - Participants and appraisees proposal of reported or observed performance; conducts performance appraisal; judges outcomes of programs; judges individual proposals and suggestions.

Some of the aforementioned dimensions were seen as slightly more important to the job of extension agents than other dimensions. The highest priority dimensions were oral communication, leadership, planning/organizing, and decision making/judgment. The lowest priority dimensions were behavioral flexibility, assertiveness, organizational sensitivity, and written communication.

After the assessment center participants completed the seven exercises, three trained evaluators who had been assigned to observe and evaluate each of the participants rated the participants on the 16 dimensions (1=low, 5=high). The three evaluators met and discussed the ratings. Where there was disagreement among the evaluators, the evaluators continued to discuss the dimensions until they had reached
consensus. Once the evaluators had reached consensus on all of the dimensions, they determined the assessment center performance of the participants on the 16 dimensions as follows:

1 = Meeting management expectations is questionable. (D)

2 = Should meet normal management expectations. (C)

3 = Should meet normal management expectations. (B)

4 = Should exceed normal management expectations. (A)

The extension agent's assessment center performance was the consensus rating they received on their skills and abilities on each of the 16 dimensions.

The assessment center evaluators participated in a four or four and a half day evaluator training program which was led by an assessment center consultant. During the training session, the seven situational exercises were described to the evaluators and they observed role players demonstrating the exercises. After each exercise, the evaluators discussed how they felt the role players should be evaluated. The assessment center consultant facilitated the discussion. The evaluators practiced writing reports by writing a report on the role player's behavior in one of the seven exercises. Throughout the evaluator's training, an emphasis was placed on observation of behavior and drawing inferences from these observations about assessment center participant's ability level on each of the 16 dimensions after they had participated in the seven situational exercises.
Reliability of an Assessment Center Evaluation

Numerous investigations appraised the reliability and validity of assessment center techniques. These studies have shown that assessment center performances are relatively high in reliability and validity.

Casio (1982) summarized a number of studies and found assessment centers reliable in distinguishing between candidates. Of promotable candidates nominated by their supervisors, the assessment center found that 30-40% of them fall in the exemplary performance category, 40% in the questionable range, and 20-30% in the unacceptable category. Also, the interrater reliability was reported to range from .60 to over .95.

Reliability of OCES Assessment Center Evaluation

Kwarteng (1986) computed the OCES overall assessment center reliability using the consensus scores on the 16 assessment dimensions. The results of the analysis revealed a Cronbach's alpha reliability coefficient of .95. Kwarteng (1986) analyzed the interrater reliability of the OCES Assessment Center performance. The results of the analysis were tested for rater agreement. An interrater reliability value of .79 was reported by the author.
Validity of an Assessment Center Evaluation

Several studies have shown that assessment centers predict short-term promotability, and are more accurate in predicting long-term advancement. Casio (1982) stated that, "assessment centers do predict future management performance and they do it well, with predictive validity in the .50’s and .60’s not uncommon" (p. 248).

Validity of OCES Assessment Center Evaluation

The OCES Assessment Center utilized forms of assessment which are job related. The job of the county chair was analyzed into its essential elements and various performances, attitudes, skills, and knowledge associated with the job were described. Multiple techniques and sources were utilized to gather the data for the job analysis, thus giving it a high degree of face validity.

The job analysis conducted by OCES contains the major activities of the county chair position as well as the relative importance of the activities allowing the assessment center dimensions to mirror these tasks. Thornton and Byham (1982) indicated that a good assessment center should be able to mirror 80-90% of the major activities associated with the job.
Purpose of Assessment Center Evaluation

The purpose of an assessment center is to determine capabilities or lack of capabilities in order to select or promote or train people in the knowledge and skills required on a specific job. The purpose of the OCES Assessment Center was to determine managerial capabilities or lack of capabilities of extension agents in performing the job of county chairperson in order to design a training and development package for the extension agents (OCES, 1984).

Three trained assessment center evaluators in assessment center procedures formatively evaluated the extension agents as they performed the simulated exercises derived from a job analysis on 16 job dimension abilities and skills required to perform the job of the county chairperson to determine their managerial capabilities or lack of capabilities. The Extension Agents' managerial capabilities or lack of capabilities were determined by assessment center performance ratings they obtained from the three evaluators on a scale of one to five: 1 = meeting normal management expectations is questionable (D); 2 = could meet normal management expectations with development (C); 3 = should meet normal management expectations (B); and 4 = should exceed normal management expectations (A).

The results of the assessment center performance ratings the Extension Agents obtained were given to the Leader, Personnel Development, OCES, The Ohio State University, Columbus. The results of the assessment center performance ratings were
used by the Leader, Personnel Development to design a trained development package for the extension agents.

**Follow-up to Assessment Center**

Suggestions would be made to individuals completing the assessment center based on their assessment center performance scores. The assessment center participants would be split into four groups for training and development purposes:

**Group 1** - (exceed normal expectations) No course required, update with leadership workshops of courses on their own.

**Group 2** - (should meet normal expectations) Might need minimum of required courses, Ohio Cooperative Extension Service leadership workshops.

**Group 3** - (meeting normal expectations - questionable) Up to 25 hours of required courses, OCES leadership workshops, Minnesota Summer School, other outside workshops.

**Group 4** - (not meeting normal expectations) Up to 50 hours of required courses, OCES leadership workshops, Minnesota Summer School, other outside workshops.
Three sets of data were used in this study. The first and second sets of data were collected through the use of the MBTI and a researcher-designed demographic questionnaire. The MBTI and the demographic questionnaire were mailed on November 28, 1990 to the 135 extension agents who were still employed during the study period.

A cover letter signed by the Associate Director, OCES; Assistant Director, Community and Natural Resource Development (CNRD); Leader, Personnel Development; and the researcher (Appendix A) accompanied the MBTI and the demographic questionnaire to help ensure as complete a response as possible. A stamped, self-addressed return envelope was also enclosed with the questionnaire for returning the completed questionnaires.

Respondents who had not responded after two weeks, December 11, 1990, were mailed a postcard (Appendix A) to remind them of the deadline. Three weeks later, December 18, 1990, nonrespondents were mailed another set of questionnaires and a cover letter (Appendix A) requesting a response within two weeks.

A total of 120 (89%) extension agents responded. The initial mailing, reminder postcard, and follow-up mailing achieved 67%, 77%, and 89% response rate, respectively. The overall response rate was 89%.
Table 3. Data Collection Procedure and Response Rate.

<table>
<thead>
<tr>
<th>Mailing</th>
<th>Mailing Date</th>
<th>Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Mailing</td>
<td>November 28, 1990</td>
<td>91 (67%)</td>
</tr>
<tr>
<td>Postcard Reminder</td>
<td>December 11, 1990</td>
<td>104 (77%)</td>
</tr>
<tr>
<td>Follow-up Mailing</td>
<td>December 18, 1990</td>
<td>120 (89%)</td>
</tr>
</tbody>
</table>

Data Analysis

The statistical package for social sciences, SPSSx, and Statistical Analysis System (SAS) available at The Ohio State University's Instructional and Research Computer Center (IRCC) was used to analyze the data. Descriptive statistics were used to summarize, organize, and describe the data. Thus, frequencies, percentages, and measures of central tendency were computed to obtain descriptive parameters on selected demographics, attitude, perception, judgment, and orientation and temperamental preferences of extension agents who attended the assessment center.

Simple ranked biserial correlations ($r_{bw}$), ranked biserial multiple correlations ($R_{rb}$), and Spearman ranked biserial multiple correlations ($R_{srwb}$) were calculated to describe the relationships among the variables.

Correlation Coefficients

For this study, an *a priori* magnitude of correlation coefficient was set at .22 to be of practical significance. The independent variables must explain about 5% of
variance in the dependent variable in order for the variable to be practically significant. The magnitude of relationships were interpreted based on the scale delineated by Davis (1977):

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>.70 or higher</td>
<td>Very strong relationship</td>
</tr>
<tr>
<td>.50 to .69</td>
<td>Substantial relationship</td>
</tr>
<tr>
<td>.30 to .49</td>
<td>Moderate relationship</td>
</tr>
<tr>
<td>.10 to .29</td>
<td>Low relationship</td>
</tr>
<tr>
<td>.01 to .09</td>
<td>Negligible relationship.</td>
</tr>
</tbody>
</table>

**Interpretation of the MBTI Continuous Preference Score**

The continuous preference score decreases from 200 to 0. While high continuous preference scores are associated with introversion, intuition, feeling, and perceiving, the low continuous preference scores are associated with extraversion, sensing, thinking, and judging. For example, as individual attitude preference score decreases from 200 preference score toward 0, the individual moves from introversion attitude towards extraversion attitude.
Findings are presented regarding: (a) description of the population response, (b) description of the extension agents, (c) description of assessment center performance score, (d) determination of psychological types using the MBTI and the Keirsey-Bates scale, (e) determination of the relationships between demographic variables and assessment center performance, (f) determination of the relationships between Keirsey and Bates temperamental preference score and assessment center performance, (g) determination of the relationships between the four psychological types: continuous attitude preference score, continuous perception preference score, continuous judgement preference score and assessment center performance, and (h) determination of the relationships between demographic variables found to be related to assessment center performance and psychological types variables found to be related to assessment center performance.
Population Response

By the cut off date of January 25, 1991, 120 extension agents had responded. This response represented an 89% rate of return as shown in Table 4. Of the 120 sets of instruments returned, four were discarded before analysis because of incomplete data. This produced a set of 116 usable instruments for an 86% return rate.

Table 4. Response of Population to a Set of Questionnaires.

<table>
<thead>
<tr>
<th>Population</th>
<th>Number of Questionnaires</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return rate</td>
<td>120</td>
<td>89</td>
</tr>
<tr>
<td>Usable returns</td>
<td>116</td>
<td>86</td>
</tr>
<tr>
<td>Non-respondents</td>
<td>19</td>
<td>14</td>
</tr>
</tbody>
</table>

N = 135.

Comparison of Respondents and Non-Respondents

Using demographic data and information from the Leader of Personnel Development, the respondents and the non-respondents were compared to determine any differences between the two groups that could bias the results. After comparing the descriptive information on the respondents and non-respondents, the investigator
concluded that there was no substantial difference between the two groups as indicated in Table 5.

Table 5. Comparison of Respondents and Non-respondents.

<table>
<thead>
<tr>
<th>Demographic Data</th>
<th>Respondents μ</th>
<th>Non-Respondents μ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td>40.92</td>
<td>41.20</td>
</tr>
<tr>
<td>Years of work experience</td>
<td>14.42</td>
<td>14.13</td>
</tr>
</tbody>
</table>

Description of the Extension Agents on Selected Demographics Variables

The personological factors collected were: age of the agents, years of work experience, gender of the agents, the agents' extension program area, and the degrees the agents' hold. This information was acquired through a demographic questionnaire mailed to the extension agents who attended the assessment center.

Gender

Of the population of extension agents who attended the assessment center, 70 (60%) were males and 46 (40%) were females as indicated in Table 6.
Table 6. Gender Distribution of the Extension Agents Who Attended the Assessment Center.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>70</td>
<td>60</td>
</tr>
<tr>
<td>Female</td>
<td>46</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>100</td>
</tr>
</tbody>
</table>

Age

The extension agents ranged in age from 25 years to 60 years of age, with 86% of the population between the ages of 30 and 49 as indicated in Table 7. The average age was 41 years.

Table 7. Age Distribution of the Extension Agents Who Attended the Assessment Center.

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 - 29</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>30 - 39</td>
<td>43</td>
<td>37</td>
</tr>
<tr>
<td>40 - 49</td>
<td>57</td>
<td>49</td>
</tr>
<tr>
<td>50 &amp; over</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>100</td>
</tr>
</tbody>
</table>

Mean ($\mu$) = 40.9. Standard deviation ($\sigma$) = 6.9. Min = 25. Max = 60.
Degree

Of the population of extension agents who attended the assessment center, 107 (94%) possessed a masters degree. One agent possessed a bachelors degree and 6 members (5%) possessed a doctoral degree as indicated in Table 8. All agents have B.S./B.A.'s but most have higher degrees also.

Table 8. Degree Distribution of the Extension Agents Who Attended the Assessment Center.

<table>
<thead>
<tr>
<th>Degree</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.S./B.A.</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>M.S./M.A.</td>
<td>107</td>
<td>93.8</td>
</tr>
<tr>
<td>Ph.D./Ed.D.</td>
<td>6</td>
<td>5.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>114</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Years of Work Experience in the Cooperative Extension Service (CES)

Table 9 reveals that the majority of the extension agents who attended the assessment center have served the CES in any state more than six years. The average number of years of work experience for the extension agents in the population was 14. Forty-seven percent of the population has 14.4 years or less serving the OCES.
Table 9. Frequency Distribution for Number of Years of the Extension Agents Who Worked in the Cooperative Extension Service.

<table>
<thead>
<tr>
<th>Years of Work Experience</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 5</td>
<td>13</td>
<td>11.4</td>
</tr>
<tr>
<td>6 - 10</td>
<td>20</td>
<td>17.5</td>
</tr>
<tr>
<td>11 - 15</td>
<td>28</td>
<td>24.6</td>
</tr>
<tr>
<td>16 - 20</td>
<td>35</td>
<td>30.7</td>
</tr>
<tr>
<td>21 - 25</td>
<td>18</td>
<td>15.8</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>100</td>
</tr>
</tbody>
</table>


**Major Program Area**

Table 10 reveals that there were five program areas of responsibility. The majority of the population (87%) reported their major area of responsibility to be agriculture (39%), home economics (25%), and 4-H and youth programs (24%). Fewer than 10% reported their major program area of responsibility to be administration (9%) or CNRD (4%).
Table 10. Distribution of the Extension Agents' Cooperative Extension Service Major Program Area.

<table>
<thead>
<tr>
<th>Major Program Area</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>10</td>
<td>8.8</td>
<td>8.8</td>
</tr>
<tr>
<td>Agriculture</td>
<td>44</td>
<td>38.6</td>
<td>47.4</td>
</tr>
<tr>
<td>Home Economics</td>
<td>28</td>
<td>24.6</td>
<td>72.0</td>
</tr>
<tr>
<td>4-H &amp; Youth Program</td>
<td>27</td>
<td>23.7</td>
<td>95.7</td>
</tr>
<tr>
<td>CNRD</td>
<td>5</td>
<td>4.4</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>116</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Year Extension Agents Attended the Assessment Center**

Figure 4 displays the year extension agents who reported that they had attended the assessment center. The bar graph represents extension agents' attendance from 1985 to 1990. More extension agents (N = 48) attended the assessment center in the year 1985 than in subsequent years. Only nine extension agents attended the assessment center in the year 1990 compared to 1985 when attendance was 48 extension agents.
Figure 4. Frequency Distribution of the Year Extension Agents Attended the Assessment Center.

Description of the Extension Agents on Assessment Center Performances

The assessment center performances of the extension agents are displayed in Table 11. An examination of the table reveals that the majority of the extension agents (82%) were either rated by the assessment center evaluators as "should meet normal management expectations" (B) or "could meet normal management expectations with development" (C). Only 15% were rated as "should exceed normal
management expectations" (A). Only 2% were rated as "meeting management expectations is questionable" (D).

Table 11. Frequency Distribution of Assessment Center Performance of Extension Agents as Rated by the Evaluators.

<table>
<thead>
<tr>
<th>Assessment Center Performance</th>
<th>N</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Should exceed normal management expectations --4(A)--</td>
<td>17</td>
<td>15.5</td>
<td>15.5</td>
</tr>
<tr>
<td>Should meet normal management expectations --3(B)--</td>
<td>51</td>
<td>46.4</td>
<td>61.9</td>
</tr>
<tr>
<td>Could meet normal management expectation with development --2(C)--</td>
<td>40</td>
<td>36.4</td>
<td>98.3</td>
</tr>
<tr>
<td>Meeting normal management expectation is questionable --1(D)--</td>
<td>2</td>
<td>1.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Median = 3.00; Mode = 3.00; Range = 3.00; Min = 1; and Max = 4.

Psychological Profiles of Extension Agents Who Attended the Assessment Center by MBTI

Psychological Profile

The psychological profiles of the OCES extension agents are displayed in Figure 5. An examination of Figure 5 reveals a wide range of psychological profiles. One profile, ISTP, was under-represented. Only one person cited a preference for
the ISTP profile out of the total of 16 possible profiles derived from the MBTI. The results suggest that all of the 16 psychological profiles that MBTI can "type" were represented in the population of extension agents who attended the assessment center. The psychological profiles INFJ (3.4%), ISFJ (8.6%), and ISFP (4.3%) were higher in the current population than those found in the samples of managers from previous studies (see Table 21, Appendix D). The psychological profiles ISTJ, ISFJ, ISTP, ISFP, ESTP, ESFP, ESTJ, and ESFJ accounted for over half of all the extension agents who attended the assessment center. Persons with these psychological profiles are often seen as realistic and practical extension agents. They solve problems by relying on past experiences that are concrete.
Table 12 reveals that the majority of the extension agents preferred extraversion attitude (57.76%), sensing perception (57.76%), thinking judgment (59.48%), and judging orientation (66.38%). Fewer than 50% of the agents indicated
preferences for introversion attitude (42.24%), intuition perception (42.42%), feeling judgment (40.52%), and perceptive orientation (33.62%).

Table 12. Myers-Briggs Typological Preferences for Extension Agents Who Attended the Assessment Center.

<table>
<thead>
<tr>
<th>Typological Preferences</th>
<th>N</th>
<th>μ</th>
<th>σ</th>
<th>%</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extrovert</td>
<td>67</td>
<td>57.76</td>
<td>26.2</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Introvert</td>
<td>49</td>
<td>42.24</td>
<td></td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Perception</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensing</td>
<td>67</td>
<td>57.76</td>
<td>30.4</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Intuitive</td>
<td>49</td>
<td>42.24</td>
<td></td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Judgment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thinking</td>
<td>69</td>
<td>59.48</td>
<td>25.2</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Feeling</td>
<td>47</td>
<td>40.52</td>
<td></td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Orientation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Judging</td>
<td>77</td>
<td>66.38</td>
<td>27.9</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Perceptive</td>
<td>39</td>
<td>33.62</td>
<td></td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

μ = mean and σ = standard deviation.

Degree of Preference

The percentages of each level of psychological preference by degree of preference are displayed in Table 13. An examination of Table 13 reveals that the extension agents who attended the assessment center cited a clear preference for extraversion (19%), introversion (13%), sensing (30%), thinking (18%), judging
(43%), and perceiving (9%), respectively. The cited "clear" preferences indicate that the respondents retain and act on the reported preference. The percentage of greatest magnitude is associated with the judging preference. Clear preference for feeling and intuition was not cited by the agents. None of the agents indicated very "clear preference" for any of the categories in Table 12.

Table 13. Percentage of Extension Agents Who Attended the Assessment Center at Each Level of Preference.

<table>
<thead>
<tr>
<th>Degree of Preference</th>
<th>Attitude</th>
<th>Perception</th>
<th>Judgment</th>
<th>Orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E</td>
<td>I</td>
<td>S</td>
<td>N</td>
</tr>
<tr>
<td>Slight</td>
<td>21.55</td>
<td>40.52</td>
<td>31.90</td>
<td>31.90</td>
</tr>
<tr>
<td>Moderate</td>
<td>49.14</td>
<td>41.38</td>
<td>30.17</td>
<td>12.93</td>
</tr>
<tr>
<td>Clear</td>
<td>18.97</td>
<td>12.93</td>
<td>30.17</td>
<td>0.00</td>
</tr>
<tr>
<td>Very Clear</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Notes: The preference score limits are: slight 1 to 9, moderate 11 to 19, clear 21 to 39, and very clear 41 and over. For preference F, clear is 21 to 29 and very clear is 31 and over.

Distribution of the Extension Agents According to Keirsey and Bates Temperament Preferences Analyzed Through the MBTI

Figure 6 displays the Keirsey and Bates temperamental preferences analyzed through the MBTI data. As indicated in the figure, the INFJ, INFP, ENFJ, and ENFP form the intuitive-feelers (NF); the ISFP, ISTP, ESFP, and ESFP form the sensing-perceivers (SP); the INTJ, INTP, ENTJ, and ENTP form the intuitive-
thinkers (NT); and the ISTJ, ISFJ, ESTJ, and ESFJ form the sensing-judgers (SJ) who attended the assessment center.

Figure 6. Keirsey and Bates Temperament Preferences Analyzed Through the MBTI.
Notes: NF = Catalyst or intuitive-feeler, SP = Troubleshooter-negotiator or sensing-perceiver, NT = Visionary or intuitive-thinker, and SJ = Traditionalist or sensing-judger.

Figure 7 displays extension agents' temperament preferences and temperament preferences for the general population taken from Keirsey and Bates (1984). Inspection of the bar graph reveals that the largest represented temperament
preference was that of sensing-judgers (SJ), sometimes called traditionalists (45%). The least represented temperament preference was sensing-perceivers (SP), sometimes called troubleshooter-negotiators (13%).

When the extension agents temperament preferences were compared with the distribution of the temperament preferences found in the general population, the sensing-judging (SJ), intuitive-thinking (NT), and intuitive-feeling (NF) temperament preferences were more prevalent in the present population of extension agents who attended the assessment center.
Relationships Between Keirsey and Bates Temperament Preferences and Assessment Center Performance

The relationship between Keirsey and Bates' temperament preferences analyzed through the MBTI to assessment center performance are displayed in Table 14.

The overall relationship between the scores of the subjects on the Keirsey and Bates model and assessment center performance was low. The ranked biserial multiple correlation ($R_{rb}$) was .12. Following the \textit{a priori} rule, the multiple ranked biserial multiple correlation ($R_{rbi}$) between Keirsey and Bates' model to assessment center performance didn't achieve practical significance at the established level. The results suggest that Keirsey and Bates' temperament preferences are independent of assessment center performance.
Table 14. Keirsey and Bates Temperamental Preferences and Assessment Center Performance.

<table>
<thead>
<tr>
<th>Temperamental Preference</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Troubleshooter-Negotiator (SP)</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Traditionalist (SJ)</td>
<td>8</td>
<td>27</td>
<td>16</td>
<td>0</td>
<td>51</td>
</tr>
<tr>
<td>Catalyst (NF)</td>
<td>3</td>
<td>5</td>
<td>12</td>
<td>1</td>
<td>21</td>
</tr>
<tr>
<td>Visionary (NT)</td>
<td>6</td>
<td>14</td>
<td>7</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>Overall</td>
<td>17</td>
<td>51</td>
<td>40</td>
<td>2</td>
<td>110</td>
</tr>
</tbody>
</table>

(Percentage)

<table>
<thead>
<tr>
<th>Temperamental Preference</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>0.0</td>
<td>4.6</td>
<td>4.6</td>
<td>0.9</td>
<td>10.0</td>
</tr>
<tr>
<td>SJ</td>
<td>7.3</td>
<td>24.6</td>
<td>14.6</td>
<td>0.0</td>
<td>46.4</td>
</tr>
<tr>
<td>NF</td>
<td>2.7</td>
<td>4.6</td>
<td>10.9</td>
<td>0.9</td>
<td>19.0</td>
</tr>
<tr>
<td>NT</td>
<td>5.5</td>
<td>12.7</td>
<td>6.4</td>
<td>0.0</td>
<td>24.6</td>
</tr>
<tr>
<td>Overall</td>
<td>15.5</td>
<td>46.4</td>
<td>36.4</td>
<td>1.8</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note: N = 110. Ranked biserial multiple correlation = .12.
A = Should exceed management expectations.
B = Should meet normal management expectations.
C = Could meet normal management expectations with development.
D = Meeting normal management expectations is questionable.

Analysis of Relationships

Following the advice of Kerlinger (1973, 1976) and the procedure described by Warmbrod and Miller (1974) in analyzing the relationships among variables. Three sets of relationships were determined: (1) the relationships between the demographic variables and the dependent variables, (2) the relationships between the
demographic variables and the major independent variables, and (3) the relationships between the major independent variable and the dependent variable.

**Relationship Between Demographic Variables and Assessment Center Performance**

Correlations between the demographic variables and assessment center performance are displayed in Table 15. As illustrated in Table 15, the correlation analysis revealed a mixture of results. Following the 5% of the dependent variable variance explained \((a \text{ priori } \rho = .22)\) cutoff rule, the correlation between assessment center performance and demographic variables were determined. The correlation between assessment center performance and years of work experience was low \((R_{srb} = .23)\), but practically significant at the established level \((R_{srb} = .23 > \text{ an } a \text{ priori } \rho = .22)\). The positive correlation, though low, indicated that assessment center performance tended to increase as years of work experience increased. The extension agents who had longer years of work were rated higher than those with shorter years of work experience.

The correlation between assessment center performance and year attended the assessment center was low, but practically significant at the established level \((R_{rb} = .25 > \text{ an } a \text{ priori } \rho = .22)\). Further examination of the relationship between assessment center performance and year attended the assessment center revealed that those who attended in 1985 were rated higher than those who attended in years 1986-1990.
Table 15. Relationship Between Demographic Variables and Assessment Center Performance.

<table>
<thead>
<tr>
<th>Demographics</th>
<th>N</th>
<th>%</th>
<th>Correlation (p)</th>
<th>Median*</th>
<th>Q1-Q3</th>
<th>Correlations were interpreted as</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>70</td>
<td>60.0</td>
<td>0.02&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.0</td>
<td>1.0</td>
<td>Negligible association</td>
</tr>
<tr>
<td>Female</td>
<td>40</td>
<td>40.0</td>
<td></td>
<td>3.0</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>114</td>
<td></td>
<td>0.16&lt;sup&gt;d&lt;/sup&gt;</td>
<td></td>
<td></td>
<td>Low association</td>
</tr>
<tr>
<td>Degree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B.S./B.A.</td>
<td>1</td>
<td>1.0</td>
<td>0.09&lt;sup&gt;c&lt;/sup&gt;</td>
<td>3.0</td>
<td>0.0</td>
<td>Negligible association</td>
</tr>
<tr>
<td>M.S./M.A.</td>
<td>107</td>
<td>92.2</td>
<td></td>
<td>3.0</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Ph.D./Ed.D.</td>
<td>2</td>
<td>1.8</td>
<td></td>
<td>3.5</td>
<td>1.25</td>
<td></td>
</tr>
</tbody>
</table>

Years of Experience

<table>
<thead>
<tr>
<th>N</th>
<th>%</th>
<th>Correlation (p)</th>
<th>Median*</th>
<th>Q1-Q3</th>
<th>Low association</th>
</tr>
</thead>
<tbody>
<tr>
<td>114</td>
<td></td>
<td>0.23&lt;sup&gt;d&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 15 continued.

<table>
<thead>
<tr>
<th>Demographics</th>
<th>N</th>
<th>%</th>
<th>Correlation (p)</th>
<th>Median*</th>
<th>Q3-Q1</th>
<th>Correlations were interpreted as:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year Attended Assessment Center</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1985</td>
<td>48</td>
<td>41.4</td>
<td>0.20^b</td>
<td>3.0</td>
<td>1.0</td>
<td>Low association</td>
</tr>
<tr>
<td>Year 1986</td>
<td>12</td>
<td>10.3</td>
<td>-0.08^b</td>
<td>2.5</td>
<td>1.0</td>
<td>Negligible association</td>
</tr>
<tr>
<td>Year 1987</td>
<td>14</td>
<td>12.1</td>
<td>-0.06^b</td>
<td>2.5</td>
<td>1.0</td>
<td>Negligible association</td>
</tr>
<tr>
<td>Year 1988</td>
<td>17</td>
<td>14.7</td>
<td>0.03^b</td>
<td>3.0</td>
<td>1.0</td>
<td>Negligible association</td>
</tr>
<tr>
<td>Year 1989</td>
<td>16</td>
<td>13.8</td>
<td>-0.11^b</td>
<td>3.0</td>
<td>1.0</td>
<td>Low association</td>
</tr>
<tr>
<td>Year 1990</td>
<td>9</td>
<td>7.8</td>
<td>-0.13^b</td>
<td>2.5</td>
<td>1.0</td>
<td>Low association</td>
</tr>
<tr>
<td><strong>CES Major Program Area</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Administration</td>
<td>8</td>
<td>7.3</td>
<td>0.33^b</td>
<td>4.0</td>
<td>1.0</td>
<td>Moderate association</td>
</tr>
<tr>
<td>2. Agriculture</td>
<td>41</td>
<td>37.6</td>
<td>0.02^b</td>
<td>3.0</td>
<td>1.0</td>
<td>Negligible association</td>
</tr>
<tr>
<td>3. Home Economics</td>
<td>28</td>
<td>25.7</td>
<td>-0.07^b</td>
<td>3.0</td>
<td>1.0</td>
<td>Negligible association</td>
</tr>
<tr>
<td>4. 4-H &amp; Youth Program</td>
<td>26</td>
<td>23.9</td>
<td>-0.23^b</td>
<td>2.0</td>
<td>1.0</td>
<td>Low association</td>
</tr>
<tr>
<td>5. CNRD</td>
<td>4</td>
<td>3.7</td>
<td>0.20^b</td>
<td>3.5</td>
<td>1.0</td>
<td>Low association</td>
</tr>
<tr>
<td>6. Others</td>
<td>2</td>
<td>1.8</td>
<td>-0.05</td>
<td>2.5</td>
<td>1.0</td>
<td>Negligible association</td>
</tr>
</tbody>
</table>

The correlation between assessment center performance and major program area was moderate and practically significant at the established level \( (R_{rb} = .43 > \text{an } a\ priori \rho = .22) \). Further examination of the relationships between major program area and assessment center performance revealed high ratings for those in administration and CNRD and low ratings for those in 4-H and youth programs. The dependent variable was unrelated to gender, age, degree, major program area of agriculture, home economics, and years 1986-1990.

**Relationships Between Both Categorical and Continuous Attitude Preference Score and Assessment Center Performance**

The overall relationships between attitude preference score and the assessment center performance is displayed in Table 16. The relationships between the dichotomous attitude preference score and assessment center performance was negligible. The ranked biserial correlation \( (r_{rb}) \) equaled .05. The relationship between the continuous attitude preference scores and assessment center performance was also negligible \( (r_{rb} = .07) \). Following the established rule, the relationships between both categorical and continuous attitude preference scores didn’t achieve practical significance at the established level \( (r_{rb} \text{ observed} = .04 \text{ and } .07 < \text{ the cut off point for an } a\ priori \rho = .22) \). The results suggest that there may be no practical relationship between the way cases are ranked on the attitude preference scores and assessment center performance.
Table 16. Relationship Between Attitude Preference Score and Assessment Center Performance.

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Extraversion</th>
<th>No.</th>
<th>%</th>
<th>Introversion</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment Center Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>9</td>
<td>14.3</td>
<td></td>
<td>8</td>
<td>17.0</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>29</td>
<td>46.0</td>
<td></td>
<td>22</td>
<td>46.8</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>24</td>
<td>31.1</td>
<td></td>
<td>16</td>
<td>34.0</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>1.6</td>
<td></td>
<td>1</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td>100.0</td>
<td></td>
<td>47</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

N = 110. Ranked biserial correlation (r_m) for dichotomous data = .05. r_b for continuous data = .07.

Note: High continuous attitude preference score is associated with introversion attitude.
A = Should exceed management expectations.
B = Should meet normal management expectations.
C = Should meet management expectations with development.
D = Meeting normal management expectations is questionable.

Relationships Between Both Categorical and Continuous Perception Preference Score and Assessment Center Performance

The overall relationship between perception preference score and assessment center performance is displayed in Table 17. The relationship between the dichotomous perception preference score and assessment center performance was negligible (r_mB = -.005). The relationship between continuous perception preference scores and assessment center performance was also negligible (r_rB = -.024).
Following the established rule, the relationship between both the categorical and continuous perception preference scores didn’t achieve practical significance ($r_{nb}$ observed = -.005 and -.024 < the cutoff point for an $a$ priori $p = .22$). The results suggest that perception preference is independent of assessment center performance.

Table 17. Relationship Between Perception Preference Score and Assessment Center Performance.

<table>
<thead>
<tr>
<th>Assessment Center Performance</th>
<th>Sensing</th>
<th>Intuition</th>
<th>Continuous Score Mean $(\mu)$</th>
<th>$\sigma$</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>8</td>
<td>9</td>
<td>103.5</td>
<td>28.5</td>
</tr>
<tr>
<td>B</td>
<td>32</td>
<td>19</td>
<td>86.2</td>
<td>28.19</td>
</tr>
<tr>
<td>C</td>
<td>21</td>
<td>19</td>
<td>97.7</td>
<td>32.0</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>1</td>
<td>121.0</td>
<td>39.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>62</strong></td>
<td><strong>48</strong></td>
<td><strong>93.7</strong></td>
<td><strong>30.4</strong></td>
</tr>
</tbody>
</table>

N = 110. Ranked biserial correlation ($r_{nb}$) for dichotonomous data = .005. $r_\phi$ for continuous data = -0.24.

Note: High perception preference score is associated with intuitive perception.
A = Should exceed management expectations.
B = Should meet normal management expectations.
C = Could meet normal management expectations with development.
D = Meeting normal management expectations is questionable.
Relationship Between Both the Categorical and Continuous Judgment Preference Score and Assessment Center Performance

The overall relationships between judgment preference scores and assessment center performance are displayed in Table 18. The relationship between the dichotomous judgment preference score and assessment center performance was low ($r_{ab} = -.15$). The relationship between the continuous judgment preference score and assessment center performance was negligible ($r_{ab} = -.06$).

Table 18. Relationship Between Judgment Preference Score and Assessment Center Performance.

<table>
<thead>
<tr>
<th>Judgment</th>
<th>Thinking</th>
<th>Feeling</th>
<th>Continuous Score Mean ($\mu$)</th>
<th>$\sigma$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>A</td>
<td>11</td>
<td>16.9</td>
<td>6</td>
<td>13.3</td>
</tr>
<tr>
<td>B</td>
<td>34</td>
<td>52.3</td>
<td>17</td>
<td>37.8</td>
</tr>
<tr>
<td>C</td>
<td>19</td>
<td>29.2</td>
<td>21</td>
<td>46.7</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>1.5</td>
<td>1</td>
<td>2.2</td>
</tr>
</tbody>
</table>

Total 65 100.0 45 100.0 91.1 25.2

$N = 110$. Ranked biserial correlation ($r_{ab}$) for dichotomous data = -.15. $r_{ab}$ for continuous data = -.06.

Note: High judgment preference score is associated with feeling decision making.

A = Should exceed management expectations.
B = Should meet normal management expectations.
C = Could meet normal management expectations with development.
D = Meeting normal management expectations is questionable.
Following the established rule, the relationships between both categorical and continuous judgment preference scores and assessment center performance didn't achieve practical significance ($r_{rb}$ observed = -.15 and -.06 < an $a priori \rho = .22$). The $r_{rb}$ for the continuous judgment preference score was lower than the $r_{rb}$ for the categorical judgment preference score. The results suggest that no pattern emerged in the way the cases were ordered on the two variables.

**Relationship Between Both the Categorical and Continuous Orientation Preference Score and Assessment Center Performance**

The overall relationship between the orientation preference score and assessment center performance is displayed in Table 19. The relationship between the dichotomous judgment preference score and assessment center performance was low ($r_{rb} = -.1985$). The relationship between the continuous orientation preference and assessment center performance was moderate ($r_{rb} = -.244$). Following the established rule, the relationship between categorical orientation preference score and assessment center performance didn't achieve practical significance at the established level ($r_{rb}$ observed = -.1980 < an $a priori \rho = .22$). However, the relationship between continuous orientation preference scores and assessment center performance achieved practical significance at the established level ($r_{rb}$ observed = -.244 > an $a priori \rho = .22$).

The relative ordering of the extension agents on orientation preference scores was not the same as their relative ordering on assessment center performance. The
results suggest that those who were perceiving oriented obtained lower assessment center performance scores and those who were judging oriented obtained higher assessment center performance scores.

Table 19. Relationship Between Orientation Preference Score and Assessment Center Performance.

<table>
<thead>
<tr>
<th>Orientation Preference Score</th>
<th>Perceptive</th>
<th>Judging</th>
<th>Continuous Score</th>
<th>Mean (μ)</th>
<th>(σ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment Center Performance</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>4</td>
<td>11.4</td>
<td>13</td>
<td>17.3</td>
<td>78.1</td>
</tr>
<tr>
<td>B</td>
<td>13</td>
<td>37.1</td>
<td>38</td>
<td>50.7</td>
<td>82.8</td>
</tr>
<tr>
<td>C</td>
<td>16</td>
<td>45.7</td>
<td>24</td>
<td>32.0</td>
<td>91.5</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>5.7</td>
<td>0</td>
<td>0.0</td>
<td>134.0</td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td>100.0</td>
<td>75</td>
<td>100.0</td>
<td>86.1</td>
</tr>
</tbody>
</table>

N = 110. Ranked biserial correlation ($r_n$) for dichotomous data = -.1985.

$r_n$ for continuous data = -.244.

Note: Higher orientation preference score is associated with perceptive orientation.

A = Should exceed management expectations.

B = Should meet normal management expectations.

C = Could meet normal management expectations with development.

D = Meeting normal management expectations is questionable.

More of the extension agents who preferred judging orientation (17%), as compared to perceptive orientation (11%), obtained the highest assessment center performance rating of "A", which would indicate that they should exceed management expectations. More of the judging oriented extension agents (51%), as compared to
perceptive oriented agents (37%) obtained the second highest assessment center performance rating of "B," which would indicate that they should meet normal management expectations. The majority of the perceptive agents (46%), as compared to judging oriented extension agents (32%), obtained the third highest assessment center rating of "C," which would indicate that meeting normal management expectations was possible with development.

Relationships Between Demographic Variables Found to be Related to Assessment Center Performance and the Continuous Orientation Preference Score

The relationship between demographic variables found to be related to assessment center performance and psychological type variables found to be related to assessment center performance was examined. It was found that the demographic variables, years of work experience, major program area, year attended the assessment center, were related to assessment center performance. The relationship between psychological types and assessment center performance was also investigated. It was found that the psychological type variable, continuous orientation preference score, was related to assessment center performance. Therefore, the relationships between the demographic variables, years of work experience, year attended the assessment center, major program area of responsibility, and the psychological type variable, continuous orientation preference score, were further examined. Table 20 displayed the relationships between demographic variables
found to be related to assessment center performance and continuous orientation preference score.

Table 20. Relationships Between Demographic Variables Found to be Related to Assessment Center Performance and Continuous Orientation Preference Score.

<table>
<thead>
<tr>
<th>Demographic Variables</th>
<th>(μ)</th>
<th>(σ)</th>
<th>(ρ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of work experience</td>
<td></td>
<td></td>
<td>-.02a</td>
</tr>
<tr>
<td>Major program area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Administration</td>
<td>86.42</td>
<td>28.06</td>
<td>.35ba</td>
</tr>
<tr>
<td>2. Agriculture</td>
<td>82.68</td>
<td>26.55</td>
<td>-.11a</td>
</tr>
<tr>
<td>3. Home Economics</td>
<td>76.43</td>
<td>21.06</td>
<td>-.20a</td>
</tr>
<tr>
<td>4. 4-H &amp; Youth Programs</td>
<td>99.89</td>
<td>30.37</td>
<td>.27a</td>
</tr>
<tr>
<td>5. CNRD</td>
<td>87.00</td>
<td>36.61</td>
<td>.00a</td>
</tr>
<tr>
<td>6. Others</td>
<td>81.00</td>
<td>33.94</td>
<td>-.03a</td>
</tr>
<tr>
<td>Year attended the assessment center</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>86.53</td>
<td>27.96</td>
<td>.25ba</td>
</tr>
<tr>
<td>1986</td>
<td>84.79</td>
<td>27.08</td>
<td>-.04a</td>
</tr>
<tr>
<td>1987</td>
<td>73.67</td>
<td>17.34</td>
<td>-.16a</td>
</tr>
<tr>
<td>1988</td>
<td>93.43</td>
<td>27.71</td>
<td>.09a</td>
</tr>
<tr>
<td>1989</td>
<td>82.88</td>
<td>27.70</td>
<td>-.05a</td>
</tr>
<tr>
<td>1990</td>
<td>91.25</td>
<td>35.18</td>
<td>.07a</td>
</tr>
<tr>
<td></td>
<td>100.33</td>
<td>27.86</td>
<td>.14a</td>
</tr>
</tbody>
</table>

- Ranked - biserial correlations (r_b).
- Ranked - biserial multiple correlations (R_b).
- R_b and r_b observed > an a priori ρ = .22.

An inspection of the table reveals that the relationship between two of the demographic variables (major program area and year attended assessment center) and continuous orientation preference score achieved practical significance (r observed = .35 and .25 > an a priori ρ = .22).
Further examination of the correlations between major program area and continuous orientation preference score revealed that those in 4-H and youth program obtained higher orientation preference scores than those in administration and CNRD. Further examination of the correlation between year attended assessment center and continuous orientation preference scores revealed the simple univariate correlation between year 1985, which was related to assessment center performance, was not related to continuous orientation preference score, therefore, year attended assessment center was excluded as an extraneous variable in explaining assessment center performance. The correlation between years of work experience and continuous orientation preference score did not achieve practical significance ($R_{pb}$ observed = -.02 < $a$ priori $p = .22$). The results suggest that years of work experience was independent of continuous orientation preference score. Therefore, it was also excluded as an extraneous variable in explaining assessment center performance.

In summary, the extension agents’ selected demographic variables and their assessment center performance were described. The extension agents’ psychological types were described according to the MBTI and the Keirsey and Bates’ temperament preferences. The relationships between demographic variables, Keirsey and Bates temperament preference score, and the four psychological variables to assessment center performance were determined. An examination of the Keirsey and Bates’ temperament preference score and assessment center performance revealed no relationship between the two.
The correlations between the demographic variables and assessment center performance indicated that major program area, year extension agents attended the assessment center, and years of work experience were related to assessment center performance. The correlation between major program area and assessment center performance revealed high ratings for those in administration and CNRD and low ratings for those in the 4-H and youth programs.

The correlation between year attended the assessment center and assessment center performance revealed that those who attended the assessment center in 1985 were rated higher than those who attended in years 1986-1990. The correlation between years of experience and assessment center performance revealed that those who had longer years of experience obtained higher assessment center ratings.

Only one of the psychological type (continuous orientation preference score) variables was found to be related to assessment center performance. The judging oriented extension agents were rated higher than those who were perceptive oriented. The correlation between major program area and continuous orientation preference score revealed that those in 4-H and youth programs obtained higher orientation preference scores than those in administration. The correlation between year attended the assessment center and continuous orientation preference score revealed that the two variables are not related. The results suggest that no pattern emerged in the way cases were ordered on the two variables. The correlation between years of work experience and continuous orientation preference score revealed that the two variables are independent of one another. Therefore, inter-relationships among
assessment center performance, continuous orientation preference score, and major program area prevented the establishment of a defendable functional relationship between continuous orientation preference score and assessment center performance.
Chapter V

Summary, Discussion, Conclusions, Recommendations for Practice, and Recommendations for Further Studies

Summary

The purpose of this study was to describe the relationship between psychological types and assessment center performance of Ohio Cooperative Extension Service agents.

The independent variable of this study was the psychological types. The instrument used to establish psychological types of agents was the Myers-Briggs Type Indicator (MBTI). The dependent variable in this study was assessment center performance. The assessment center performance was established by evaluators trained in assessment center procedures.
Demographic variables that could have influenced the possible relationship between psychological types and assessment center performance were identified and measured.

**Objectives of the Study**

The objectives of the study were:

1. To describe the demographic variables of OCES extension agents who attended the OCES assessment center.
   a. Gender.
   b. Age.
   c. Number of years of work experience in the Cooperative Extension Service (CES).
   d. Degree (B.S./B.A., M.S./M.A., Ph.D.).
   e. Year the extension agents attended the assessment center.
   f. Major program area:
      - Agriculture.
      - Home economics.
      - 4-H and youth.
      - Community and natural resources development.

2. To describe the assessment center scores for the OCES extension agents.

3. To describe the psychological profile of extension agents who attended the assessment center according to the MBTI.
4. To describe extension agents who attended the assessment center according to their typological preference for attitude, perception, judgment, and orientation.

5. To describe the extension agents who attended the assessment center according to their Keirsey and Bates' (1978) temperament preferences analyzed through the MBTI.

6. To describe the relationships between the Keirsey and Bates (1978) temperament preferences and assessment center performance.

7. To describe the relationships between selected demographic variables and assessment center performance.

8. To describe both the categorical and continuous relationship between the MBTI, attitude, judgment, perception, orientation preference scores, and assessment center performance.

9. To describe the relationship between the demographics variables found to be related to assessment center performance and psychological type variable: continuous orientation preference score.

**Procedures**

Plausible alternative variables could have influenced the relationship between psychological type variables and assessment center performance. To control for some of these alternative explanations, an ex post facto research design was used for this study. The major weaknesses of ex post facto research design are (1) the inability
to assign randomly individuals to treatment levels, (2) the inability to manipulate the
independent variables, and (3) the risk of interpreting correlation as causation.
These weaknesses are apparent in this study because the extension agents could not
be assigned randomly to personality types.

A field tested and revised demographic questionnaire together with an MBTI
questionnaire (standard instrument) was mailed to the population of extension agents
(N = 135) involved in the study. Responses were obtained from 120 of the 135
subjects, which was an 89 percent response rate. Of the 120 sets of instruments
returned, four were discarded because of incomplete data for 86% usable return rate.
Unobtrusive methods were utilized to gather data on the extension agents'assessment center performance, age, and years of work experience.

The data obtained from the agents' personnel records were used to compare
respondents and non-respondents on their personal characteristics. The demographic
data were identified and added to the research design to control for rival
explanations, other than MBTI score, for assessment center performance.

The data obtained through the demographic questionnaire and the data
obtained through the MBTI questionnaire were merged at the Ohio State University
Computer Center. The data was coded and analyzed through the use of a statistical
package for social sciences, SPSSx, and SAS available at Ohio State University
Instructional Research Computer Center (IRCC). Descriptive statistics were used
to summarize, organize, and describe the data. Thus, frequencies, percentages, and
measures of central tendency were computed to obtain descriptive information on the
agents' demographics, psychological type variables, and assessment center performance.

Findings

Descriptive Information on the Demographic Variables of the Extension Agents Who Attended the Assessment Center

Of the population of the extension agents who attended the assessment center, 60 percent were males and 40 percent were females. The extension agents ranged in age from 25 years to 60 years with 86 percent of the population between the ages of 30 and 49. The extension agents appeared to be well educated: 92 percent had completed degrees above the bachelor's degree level and 5 percent had completed a doctorate degree (Ph.D./Ed.D.). The majority of the extension agents who attended the assessment center had served the CES more than six years; however, 14.4 was the average number of years of work experience. More extension agents (N = 48) attended the assessment center in the year 1985 than in subsequent years. Only 9 percent of the population attended the assessment center in year 1990. Major program areas of the agents were agriculture (39%), home economics (25%), 4-H and youth programs (24%), and CNRD (4%).

Descriptive Information on the Extension Agents' Assessment Center Performances

Sixteen percent of the agents were rated by the assessment center evaluators to exceed normal management expectations (A); 46% were expected to meet normal management expectations (B); 36% were expected to meet normal management
expectations with further development (C); and only 2% obtained ratings that questioned their capabilities to meet normal management expectations (D).

**MBTI Psychological Profile of OCES Extension Agents Who Attended the Assessment Center**

The descriptive data revealed that a wide range of psychological profiles was found with the extension agents; ISTP was under-represented. Only one person cited a preference for the ISTP profile out of the 16 profiles derived from MBTI. The results suggest that all of the 16 psychological profiles that MBTI can "type" were represented in the population of the extension agents who attended the assessment center.

The psychological profiles INFJ (3.4%), ISFJ (8.6%), and ISFP (4.3%) were higher in the current population than those found in the general population (see Table 21 in Appendix D). The psychological profiles ISTJ, ISFJ, ISTP, ISFP, ESTP, ESFP, ESTJ, and ESFJ accounted for over half of all of the extension agents who attended the assessment center. Persons with these psychological profiles are often seen as realistic and practical extension agents. They solve problems by relying on past experience that were concrete.
Myers-Briggs Typological Preferences for Extension Agents Who Attended the Assessment Center

The typological preferences were described for the extension agents' attitude, perception, judgment (decision-making), and orientation. More of the extension agents who attended the assessment center preferred an attitude of extroversion (58%), sensing perception (58%), thinking decision making (59%), and judging orientation (66%). Fewer preferred an attitude of introversion (42%), intuitive perception (42%), feeling decision making (41%), and perceptive orientation (34%). The extension agents who cited "clear preference" for extraversion (19%), introversion (13%), sensing (30%), thinking (18%), judging (43%), and perceiving (9%) retain and act on the reported preference.

Frequency Distribution of Keirsey and Bates' Temperamental Preferences Analyzed Through the MBTI Data

Proportionally, Keirsey and Bates' temperamental preferences of intuitive-thinkers (NT) sometimes called visionaries (24%), intuitive-feelers (NF) sometimes called catalysts (18%), and sensing-judgers (SJ) sometimes called traditionalists (45%) dominated the population of extension agents who attended the assessment center. The largest represented temperament preference was that of sensing-judging (SJ = 45%). The least represented temperament preference was sensing-perceiving (SP = 13%).
**Relationship Between Keirsey and Bates' Temperamental Preferences Analyzed Through the MBTI to Assessment Center Performance**

The relationship between Keirsey and Bates' temperamental preferences and assessment center performance did not achieve practical significance at the established level, $R_{rb}$ observed = .12 < an *a priori* $\rho = .22$.

**Relationships Between the Demographic Variables and Assessment Center Performance**

The relationships between the demographic variables of years of work experience ($r_{rb} = .23$), year extension agent attended the assessment center ($R_{rb} = .25$), and major program area ($R_{rb} = .43$) and assessment center performance achieved practical significance at the established level, $R_{rb}$ and $r_{rb}$ observed - .23, .43, .33, -.23 > an *a priori* $\rho = .22$. The relationships ranged from low to moderate.

The correlation between major program area and assessment center performance revealed high ratings for those in administration and CNRD and low ratings for those in the 4-H and youth programs. The correlation between year attended the assessment center and assessment center performance revealed that those who attended the assessment center in 1985 were rated higher than those who attended in the years 1986-1990. The correlation between years of experience and assessment center performance revealed that those who had longer years of experience obtained higher assessment center ratings.
Relationship Between Both Categorical and Continuous Attitude Preference Score to Assessment Center Performance

The relationship of categorical attitude preference score, $r_{rb} = .04$, and continuous attitude preference score, $r_{rb} = .07$, to assessment center performance didn't achieve practical significance at the established level ($r_{rb}$ observed = .04 and .07 $<$ an a priori $\rho = .22$).

Relationship Between Both Categorical and Continuous Perception Preference Score to Assessment Center Performance

The relationship of categorical perception preference score ($r_{rb} = -.005$) and continuous attitude preference score ($r_{rb} = -.024$) and assessment center performance didn't achieve practical significance at the established level ($r_{rb}$ observed = -.005 and -.024 $<$ an a priori $\rho = .22$).

Relationship Between Both Categorical and Continuous Judgment Preference Score to Assessment Center Performance

The relationship of categorical judgment preference score ($r_{rb} = -.15$) and continuous attitude preference score ($r_{rb} = -.06$) to assessment center performance didn't achieve practical significance at the established level ($r_{rb}$ observed = -.15 and -.05 $<$ an a priori $\rho = .22$).
Relationship Between Both Categorical and Continuous Orientation Preference Score to Assessment Center Performance

The relationship of categorical orientation preference score and assessment center performance didn't achieve practical significance at the established level ($r_b$ observed = -.02 < an $a$ priori $\rho = .22$). However, the relationship between the continuous orientation preference score and assessment center performance achieved practical significance ($r_b$ observed = -.224 > an $a$ priori $\rho = .22$).

Relationship Between Demographic Variables Found to be Related to Assessment Center Performance and Continuous Orientation Preference Score

The relationship between demographic variables found to be related to assessment center performance and the psychological type variable found to be related to assessment center performance was examined. It was found that major program area ($R_n = .35$) and year extension agent attended the assessment center ($R_n = .25$) achieved practical significance ($R_n$ and $r_b$ observed = .35 and .25 > an $a$ priori $\rho = .22$). The relationship ranged from moderate to low.

Further examination of the correlation between major program area and continuous orientation preference score revealed that those in 4-H and youth programs obtained higher orientation preference scores than those in administration and CNRD. Further examination of the correlation between year attended assessment center and continuous orientation preference score revealed a multiple correlation between the two variables. However, the simple univariate correlation between year 1985 which was related to assessment center performance and
continuous orientation preference score revealed that the two variables are not related, therefore, year attended the assessment center was excluded as an extraneous variable in explaining assessment center performance.

The correlation between years of work experience and continuous orientation preference score didn't achieve practical significance ($r_{ab}$ observed = -.02 < a priori $\rho = .22$). The results suggest that years of work experience was independent of continuous orientation preference score therefore it was excluded as an extraneous variable in explaining assessment center performance.

**Summary of Findings Regarding the Relationships Among the Demographic Variables, Psychological Types, and Assessment Center Performance**

The demographic variables, extraneous variables that were found to be related to assessment center performance were years of work experience, major program area, and year extension agents attended the assessment center. Extension agents who had longer years of experience had higher assessment center performance than those who had less work experience. Extension agents who were in the major program area of administration had higher assessment center performance than those who were in other program areas. Extension agents who were in the major program area of 4-H and youth had lower assessment center performance than those who were in other program areas.

There was a low, but positive relationship between year extension agents attended the assessment center and assessment center performance. The relationship
between year attended the assessment center and assessment center performance revealed that those who attended the assessment center in 1985 were rated higher than those who attended in years 1986-1990.

The significant correlations between the three extraneous variables (years of work experience, major program area, and year extension agents attended the assessment center) and assessment center performance would represent a serious threat to internal validity if these extraneous variables were also related significantly with psychological type variables. Therefore, it was necessary to determine the relationships between those extraneous variables found to be related to assessment center performance and the psychological variables found to be related to assessment center performance.

The only relationships between extraneous variables and the psychological type variable of continuous orientation preference score were for major program area and year extension agents attended the assessment center.

The extension agents who were in the major program area of 4-H and youth programs and attended the assessment center between 1985 and 1990 obtained higher continuous orientation preference scores than those in administration and CNRD. The fact that two of the extension agents' demographic variables, major program area and year attended the assessment center, were found to be related to the independent variable, continuous orientation preference score, and the dependent variable, assessment center performance, threatens the internal validity of the main
aim of the investigation concerning the relationships between psychological types and assessment center performance of the Ohio Cooperative Extension Service agents.

However, the univariate correlation between year 1985 which was related to assessment center performance and continuous orientation preference didn’t achieve practical significance, therefore year attended the assessment center was excluded as an extraneous variable in explaining assessment center performance. Since extension agents who were in major program area of 4-H and youth programs obtained higher continuous orientation preference scores than those in administration and CNRD, it might be expected that the agents who were in major program area of 4-H and youth programs would have lower assessment center performance than those in administration and CNRD.

Even though the continuous orientation preference scores of the extension agents were not found to be related to other extraneous variables reported in Table 20, it should be noted that the extension agents who obtained higher orientation preference scores and were in 4-H and youth programs tended to have characteristics that accompany lower assessment center performance, while those who obtained lower orientation preference scores and were in administration and CNRD program areas tended to have attributes that accompany higher assessment center performance. The practical negative relationships between major program area and continuous orientation preference score confirm the expectation that the 4-H and youth program agents would be perceptive oriented and would have lower assessment center performance than those in administration and CNRD program areas who
would be judging oriented and would have higher assessment center performance (higher orientation preference score is associated with judging orientation and lower orientation preference score is associated with perceiving orientation).

Discussion

Discussion of Findings

All 16 psychological profiles of MBTI are represented in the population of the extension agents who attended the assessment center. The results are in agreement with the advice of Myers (1974) and recommendation by Robey and Taggart (1984) that all 16 psychological profiles are required for organizational development, so that there is a balance between perceiving and judging. The intuitive provides a clear vision of the future which can be analyzed logically by the "thinker" and practically by the "sensor" while the "feeler" can skillfully handle the people in the organization. However, the psychological profiles INFJ, ISFJ, and ISFP were more prevalent in the study population of extension agents than those found in the samples of managers from previous studies (Myers and McCaulley, 1985). The results suggest that there may be an imbalance between perceiving and judging in the OCES.

More of the extension agents preferred extraversion attitude, sensing perception, thinking decision making, and judging orientation. Fewer preferred the attitude of introversion, intuitive perception, feeling decision making, and perceptive orientation. Agents who cited "clear preference" for any of the preferences held are
likely to act on their cited preferences. The results of these findings are consistent with findings reported by Richardson (1990) who found that, proportionately, extension professionals were more extraverted and less introverted and more sensing and less intuitive.

All of the temperament preferences described by Keirsey and Bates were represented in the population of extension agents who attended the assessment center. However, the temperament preferences NT, NF, and SJ were more prevalent in the study population than those found in the general population data taken from Keirsey and Bates (1984). The SP temperament preference was under represented with less than half the population found in the general population. The results are not in total agreement with the population data supplied by Keirsey and Bates (1984) suggesting that there may be some imbalance among the temperament preferences in the OCES.

The relationship between Keirsey and Bates temperament preference score and assessment center performance was practically insignificant. The insignificant relationship suggests that there is no pattern in the way cases are ordered in the two variables. The results failed to support Keirsey and Bates (1978) and Lueder (1986) who concluded that the temperament preferences were related to on the job behavior.

The relationships between the demographic variables: gender, degree, major program area of agriculture, and major program area of home economics and assessment center performance were found to be negligible and practically
insignificant. The results suggest that these variables are independent of assessment center performance.

The negligible and practical insignificant relationship between gender and assessment center performance is consistent with findings reported by Ritchie and Moses (1983) who concluded that the differences in management potential were more attributed to individual differences rather than gender differences.

The relationships between the demographic variables: age and major program area of CNRD and assessment center performance were low and practically nonsignificant. The results suggest that these variables are independent of assessment center performance.

The practically insignificant and low relationship between age and assessment center performance supports the review by Thornton and Byham (1982) who found no published studies that suggested a strong relationship between age and assessment center performance.

The low and practical significant relationship between years of work experience and assessment center performance correlate with studies reported by Ginger, Dispenziere, and Eisenger (1983) who conclude that experience rather than age of workers determined performance. McGowen (1980, p. 29) proposed that "more experience would reflect better performance."

The moderate and practical significant positive correlation between major program area and assessment center performance contradicted Kwarteng (1986) who found that no significant relationship between major program area and assessment
center performance. However, the practical significant relationship between major program area reported as administration correlated with a study by Boone (1988) who concluded that the extension agents who had experience in major program area of administration had higher assessment center performance.

The practical significant negative correlation between major program area reported as 4-H and youth programs is consistent with the results reported by Boone (1988) who found that 4-H and youth agents had lower assessment center performance.

The relationship between both the categorical and continuous attitude preference scores and assessment center performance was found to be practically insignificant. The results suggest that attitude preference is independent of assessment center performance. The results support Jung's (1921) assertion that attitude, which carries the dominant function, and the preferred function, which determines one's approach, and the auxiliary functions all operate together; attitude directs interest. In view of the function of the attitude, one would expect that the attitude alone would not make a difference in assessment center performance.

The relationship between both the categorical and continuous perception preference scores and assessment center performance was found to be practically insignificant. The results suggest that perception preference scores are independent of assessment center performance. The results failed to support Thompson (1987) who found a prevalence of "sensing perceivers" among farmers and agricultural
professionals. About 39 percent of the study population worked in the agriculture program area.

The relationship between both the categorical and continuous judgment preference scores and assessment center performance was found to be practically insignificant. The results suggest that judgment preference scores are independent of assessment center performance. These results are at variance from what would be expected with top management. Roach (1986) concluded that a predominance of "thinkers" is found in high level management positions and Myers (1962) concluded that "thinkers" rise to the top positions in organizations. It should be noted, however, that county chair positions are first line administrative positions.

The relationship between both the categorical and continuous orientation preference scores and assessment center performance was practically significant and positive. The results suggest that those who were perceiving oriented obtained lower assessment center performance ratings and those who were judging oriented obtained higher assessment center performance ratings. The finding relates to a study by Hoffman (1986) who concluded that many educational administrators are typed as having a judging orientation (habits).

The demographic variables (major program area) and the psychological variable (continuous orientation preference score) were found to be related to assessment center performance. Major program area was also found to be related to continuous orientation preference score. Therefore, interrelationships among assessment center performance, continuous orientation preference score, and major
program area prevented the establishment of a defendable functional relationship between continuous orientation preference score and assessment center performance.

Conclusions

1. The extension agents appeared to be well educated: all agents have B.S./B.A.'s but most have a higher degree also.

2. All of the 16 psychological profiles of the MBTI were represented in the study population of extension agents, therefore, OCES has not systematically excluded any particular profile.

3. The psychological profiles INFJ, INFJ, and ISFP were more prevalent in the study population than those found in the samples of managers from previous studies.

4. More extension agents preferred the attitude of extraversion and the mental functions of sensing perception and thinking decision making. Fewer preferred the attitude of introversion and the mental functions of intuition and feeling decision making.

5. All of the temperament preferences described by Keirsey and Bates were represented in the present population, therefore, OCES has not systematically excluded any particular temperament preference.
6. The temperament preferences: NT (visionaries), NF (catalysts), and SJ (traditionalists) were more prevalent in the study population than those found in the general population.

7. The proportion of agents in the temperament preference: SP (trouble shooter - negotiator) is less than half of those found in the general population.

8. The extension agents who were in administration and CNRD performed better at the assessment center than those in 4-H and youth programs.


10. The extension agents who had more years of work experience performed better at the assessment center than those who had less years of work experience.

11. The dependent variable: assessment center performance was not related to age, gender, educational degree earned, major program area of home economics and agriculture, and years 1986-1990.

12. The demographic variable: major program area correlated with the major independent variable: orientation preference. The 4-H agents obtained lower orientation preference scores, that is, they were perceiving oriented. Those in administration and CNRD obtained higher orientation preference scores, that is, they were judging oriented.

13. The major independent variable: orientation preference correlated negatively with the dependent variable: assessment center performance. The
extension agents who were perceiving oriented obtained low assessment center performance ratings and those who were judging oriented obtained higher assessment center performance ratings.

14. The major independent variables, psychological type variables: attitude, perception, and judgment were not related to assessment center performance.

15. The major independent variables: psychological types were not related to years of work experience, year attended assessment center, or major program area: (1) agriculture, (2) home economics, and (3) CNRD.

16. The demographic variable: major program area was the only variable found to be related to both the independent variable and dependent variables, therefore the investigator was unable to sort out the unique contribution of the demographic variable and the psychological type variable in explaining the agents' assessment center performance.

**Recommendations for Practice**

1. The OCES and similar organizations that utilize assessment centers may use the MBTI as an indicator of potential assessment center performance. The MBTI is recommended as an indicator of potential assessment center performance because the extension agents who were "typed" by the MBTI as judging oriented performed better than those who were "typed" as perceiving oriented. However, the OCES and assessment center clientele should be aware of the close association
between the demographic variables (major program area) and psychological type variable (orientation preference score) measured by the MBTI. Major program area of responsibility offers a competing explanation for performing better at the OCES assessment center.

2. The OCES and similar organizations that utilize assessment centers may use the MBTI to insure that the OCES is not excluding any particular profile or temperament preference. If the OCES excludes some profiles and some temperament preferences, the organization may overlook some potentially effective creative people who could become good managers.

3. The OCES and similar organizations that utilize assessment centers may use the MBTI to obtain psychological profile information about the extension agents so that pre-assessment center in-service education can be planned to develop their less preferred attitude, mental functions, assessment center skills, and abilities.

4. The extension agents assessment center performance ratings may not be durable over time. The OCES can develop the agents as managers. The fact that these agents have been to the assessment center and received low assessment center performance ratings may indicate the need for in-service education to help the agents develop their management skills and abilities and to understand and utilize their judging orientation.

5. The OCES may use the MBTI as a supplemental measure to assessment center measures to expand its current knowledge of the extension agents for career development and performance improvement; and for organizational development.
If OCES knows more about the extension agents, including their psychological profiles, then the organization can sometimes plan projects, team work, and other activities around this information to develop the agents' less preferred functions, and hence, professional growth for the agent and increased productivity and prosperity for the organization.

6. Given that the psychological profiles INFJ, ISFJ, and ISFP and the temperament preferences NT, NF, and SJ were more prevalent in the study population than those found in the sample of managers in previous studies and the general population, the OCES may consider having more of the other profiles and more of the SP temperament preference to provide balance between perceiving and judging in the OCES.

**Recommendations for Further Study**

1. Conduct future studies using extension agents from other states with assessment centers (e.g. Alabama) to determine the extent to which the results obtained in this study would be similar in different locations. In order to generalize about the usefulness of MBTI, studies done in different locations would be useful. If a future study conducted at Alabama produces similar results with extension agent chairs in Alabama, then the results of this study can be generalized to Alabama extension agents in their setting. Studies conducted at different locations with different populations will determine the extent to which the results of this study can
be generalized to different subjects, settings, etc. suggesting external validity of this study.

2. Conduct future studies using various personality forms (e.g., Strong Vocational Interest Bank-Strong Campbell Interest Inventory (SVIB-SCII) to determine whether or not the results obtained in this study would be similar with a different assessment instrument; as a justification or reliability check. If studies conducted using a variety of personality instruments produces similar results, then the results of those studies and this study would provide congruent validity justification for the MBTI and assessment center performance. Studies conducted with different personality instruments would determine the extent to which the results of this study are congruent with other instruments which measure the same constructs.

3. Conduct future studies using the same extension agents employed in the study with MBTI form G that was used in this study to determine the consistency of the MBTI for reliability justification.

4. Conduct future research to identify and examine the relationships of other independent variables such as the extension agent's management in current job role, number of relevant in-service training sessions, seniority, levels of skill, company loyalty, needs, goals, energy level, drive, motivation, perceived purpose of assessment centers, perceived reward of management, aspiration for management, perceived career and organizational development associated with assessment center performance. Such independent variables may provide additional information about why some agents score higher in certain areas than others at the assessment center.
5. Conduct future studies using the MBTI and also a more definitive measure of assessment center performance. Future studies conducted using the MBTI and a more definitive measure of assessment center performance would more accurately reveal the relationships between psychological types and assessment center performance.

6. Conduct future studies to examine why extension agents in administration and CNRD program areas obtained higher assessment center performance ratings than those in other program areas.

7. Conduct cost benefit studies to determine the extent to which additional information which MBTI can provide is cost effective. If the staff time, money, and miscellaneous resources OCES would use to gather the agents' profile information through the MBTI do not outweigh the benefits that the profile information would provide, then OCES can use MBTI as an indicator of potential assessment center performance.
Appendix A

Correspondence
Dear Assessment Center Participant:

The purpose of this letter is to solicit your participation in a research project of Ohio Cooperative Extension Service. The study will look at the relationship between the psychology profile (Myers-Briggs Type Indicator) and Assessment Center performance of Ohio Cooperative Extension agents.

We have worked closely with Joseph Ishaya, a graduate student, in the development of this study. We encourage your participation as it will help us in our training and development efforts.

Please fill out both of the enclosed questionnaires completely. There are no "right" or "wrong" answers on the Myers-Briggs Type Indicator questionnaire. Please complete it as "honestly" as you possibly can so that we can learn more about the Assessment Center measures. The estimated time for completion of the questionnaires is 45 minutes. The code number displayed in the right-hand corner of the questionnaires allows for identification of non-respondents. We assure you that the information requested will only be used in an overall analysis; no individual data will be singled out in this investigation.

If you desire to have your profile and a summary of the study, please check the proper response on the demographic questionnaire.

Please return the completed questionnaires in the self-addressed envelop before December 18, 1990. Your prompt response is important to us. If you have any questions as you complete the questionnaires, call Joseph at (614) 292-1354.

Sincerely,

Dr. Keith L. Smith
Associate Director, OCES

Dr. John D. Rohrer
Assistant Director, CNRD

Dr. Jo M. Jones
Leader, Personnel Development

Joseph B. Ishaya
Graduate Student
December 11, 1990

Dear Assessment Center Participant:

About two weeks ago you received a questionnaire from our Department regarding your psychological profile. We have not yet received your response. We would greatly appreciate your help in conducting this study. We would be very grateful if you could take the time to complete the questionnaire and return it by December 18, 1990. If you have returned the questionnaire, please disregard this message. If you need another copy of the questionnaire, please contact Joseph Ishaya at 614-292-1354. Thank you for your time and consideration.

Sincerely,
Joseph B. Ishaya et al. (1990)

cc: Dr. John D. Rohrer
December 18, 1990

Dear Assessment Center Participant:

About three weeks ago you should have received two forms with a cover letter from Dr. Keith Smith, Dr. John Rohrer, Dr. Jo Jones, and myself regarding your psychological profile (Myers-Briggs Type Indicator). Your response is needed as an integral part of this study to help us in our training and development efforts.

The purpose of this letter is to ask you again to complete these instruments. At present I have an 80 percent return on the first mailing. A 95 percent to 100 percent return is needed and would be a strong factor in giving the study validity.

As of this date we have not received your instruments. *If you have not responded on these forms, take a few minutes today and do so.* Enclosed is an additional set of instruments and self-addressed stamped return envelope for your use in case you have misplaced the original set.

**Please return these instruments by January 20, 1991.** If you have already returned a copy of these instruments, please disregard this letter. Also, if you have questions, feel free to contact me at (614) 292-1354.

Sincerely,

Joseph B. Ishaya
Graduate Student

JI/cd

enclosures: 2

cc: Dr. John D. Rohrer
Dear Assessment Center Participant:

The purpose of this letter is to express my personal thanks to each and every one of you for your responses to the Myers-Briggs Type Indicator (MBTI) and the demographic questionnaire during the months of December and January. In response to your request, I enclose with this letter the report sheets for your personality profile.

As indicated in the letter that went to you with the two questionnaires, a high response rate was needed to give the study a strong validity. Thanks to all of you, an 86 percent return rate was obtained. I have a feeling that this type of response rate indicates your support for research and dedication to your work.

The psychological type preferences scores on your personality profile report sheets was a result of how you responded on the MBTI questionnaire. An explanation of the scores computed on your responses is presented on the report sheets. The MBTI developers advise you to read the explanation. I also encourage you to read it. As indicated in the letter that went out to you with the two questionnaires, only code numbers were used in the final analysis. Individual confidentiality was and will be maintained in this research. Copies of the study will be available in the Agricultural Library of The Ohio State University upon completion.

If you have any questions, feel free to contact me at my office (614/292-1354) or at home (614/268-9163).

Sincerely,

Joseph B. Ishaya

cc: Dr. John D. Rohrer
July 29, 1991

Consulting Psychologists Press
577 College Avenue
Palo Alto, CA 94306

Dear Sir/Madam:

The purpose of this letter is to seek your permission to include a copy of Myers-Briggs Type Indicator (MBTI) Form G in my dissertation study at the Ohio State University. The topic of my dissertation was to describe the relationships between psychological types and assessment center performance of Ohio Cooperative Extension agents.

The instrument used to establish the psychological types of the agents as the MBTI. The assessment center performance was established by evaluators trained in assessment center procedures.

If you can't grant the permission to include a copy of the MBTI Form G, then send me alternative materials to include in my dissertation. Your prompt reply is important in speeding up the dissertation process.

I am looking forward to hearing from you.

Sincerely,

Dr. John Rohrer
Advisor

Joseph B. Ishaya
Graduate Student

JI/cd
Dear Customer,

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Appendix B

Panel of Experts

Who Reviewed the

Demographic Instrument
Dr. J. David McCracken  Professor  
Department of Agricultural Education  
The Ohio State University  

Dr. John D. Rohrer  Associate Professor, Assistant Director  
Community and Natural Resources Development  
Ohio Cooperative Extension Service  
The Ohio State University  

Dr. Keith L. Smith  Professor, Associate Director  
Ohio Cooperative Extension Service  
The Ohio State University
Appendix C

Sample of Survey Instruments
Demographic Questionnaire

Circle the number of the appropriate answer to each of the following questions or fill in the blanks provided.

A. What is your gender?
   1. Male
   2. Female

B. What is your age at your last birth date?

C. What were your undergraduate and graduate degrees and major fields of study?
   
<table>
<thead>
<tr>
<th>Degree</th>
<th>Major field of study</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BS/BA</td>
<td></td>
</tr>
<tr>
<td>2. MS/MA</td>
<td></td>
</tr>
<tr>
<td>3. PhD/EdD</td>
<td></td>
</tr>
<tr>
<td>4. Other (Specify)</td>
<td></td>
</tr>
</tbody>
</table>

D. How many professional full-time positions did you hold before joining the Ohio Cooperative Extension Service?

   Number of full-time positions ___________

E. How many years had you held a professional position prior to joining the Ohio Cooperative Extension Service?

   Years _____ Months _____

F. How many years or months have you been an employee of the Ohio Cooperative Extension Service?

   Years _____ Months _____

G. What is your current position?
   1. County Extension Agent - Non-Chair
   2. County Chair
   3. Acting County Chair
   4. District Specialist
   5. State Specialist/Program Leader
   6. Other (Specify) _______________

H. How many years and months have you held your current position?

   Years _____ Months _____

I. In your current position, what is your major Extension program area?
   
<table>
<thead>
<tr>
<th>Program Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Administration</td>
</tr>
<tr>
<td>2. Agriculture</td>
</tr>
<tr>
<td>3. Home Economics</td>
</tr>
<tr>
<td>4. 4-H and Youth Programs</td>
</tr>
<tr>
<td>5. Community and Natural Resources Development</td>
</tr>
<tr>
<td>6. Other (Specify)</td>
</tr>
</tbody>
</table>

J. What best describes your position at the time of your participation in the Assessment Center?

   1. County Chair
   2. Acting County Chair
   3. County Extension Agent - Non-Chair
   4. Other (Specify) _______________

K. How long had you held that position prior to participation in the Assessment Center?

   Years _____ Months _____

Thank you for agreeing to complete these forms. If you wish to have a copy of your profile or the study summary, or both, please check the appropriate space below.

1. _____ Yes, I wish to have a copy of my profile.
2. _____ Yes, I wish to have a copy of the study summary.
3. _____ Yes, I wish to have both.
4. _____ No, I do not wish to have a copy of either.
SAMPLE ITEMS FOR THE

Myers-Briggs Type Indicator®
Form G

by Katharine C. Briggs and Isabel Briggs Myers

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

PART I: Which answer comes closer to telling how you usually feel or act?

4. Do you prefer to
   (A) arrange dates, parties, etc. well in advance, or
   (B) be free to do whatever looks like fun when the time comes?

21. Do you usually
   (A) value sentiment more than logic, or
   (B) value logic more than sentiment?

PART II: Which word in each pair appeals to you more? Think about what the words mean, not how they look or sound.

39. (A) Systematic
    (B) Casual

64. (A) Quick
    (B) Careful

PART III: Which answer comes closer to telling how you usually feel or act?

79. Are you
    (A) easy to get to know, or
    (B) hard to get to know?

84. When you start a big project that is due in a week, do you
    (A) take time to list the separate things to be done and the order of doing them, or
    (B) plunge in?
Appendix D

MBTI Profiles of OCES Extension Agents Who Attended the Assessment Center from 1985-1990 as Compared to the MBTI Profiles of Managers in Previous Studies Taken from Myers and McCaulley (1985, p. 90)
Table 21. MBTI Profiles of OCES Extension Agents Who Attended the Assessment Center Compared to MBTI Profiles of Managers in Previous Studies.

<table>
<thead>
<tr>
<th>MBTI Profiles</th>
<th>Ishaya Study</th>
<th>Low</th>
<th>High</th>
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<tr>
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<td>28.67</td>
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<td>6.48</td>
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<td>INFJ</td>
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<td>INTJ</td>
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<td>0.85</td>
<td>6.67</td>
</tr>
<tr>
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<td>0.32</td>
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<td>8.63</td>
</tr>
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<tr>
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<td>3.4</td>
<td>0.00</td>
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<td>1.58</td>
<td>8.63</td>
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<tr>
<td>ENFJ</td>
<td>3.4</td>
<td>0.00</td>
<td>5.76</td>
</tr>
<tr>
<td>ENTJ</td>
<td>7.8</td>
<td>5.33</td>
<td>17.27</td>
</tr>
</tbody>
</table>

*aRange of MBTI Samples of Managers in Previous Studies

*a MBTI profile data taken from Myers and McCaulley (1985, p. 90).
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