THE CORRELATION OF STUDENT ACHIEVEMENT AND TYPE PREFERENCES\DIFFERENCES OF STUDENTS AND TEACHERS

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CHAPTER I

DESIGN OF THE STUDY

It has been said that in our democratic, American society, the educational system should be founded on efficiency, equality, and liberty (Guthrie, Garms, & Pierce, 1988). These characteristics are viewed "as conditions that government should maximize. . . .Belief in them has historical roots that are deeply embedded in America's heritage. This belief permeates the ideologies promulgated by political parties, religions, schools and other social institutions" (Guthrie, et al., 1988, p. 22).

A conflict occurs, however, when homogeneous treatments are applied to heterogeneous groups. The result is not equality or liberty, and only superficially can homogeneous treatments be viewed as efficient (Guthrie, et al., 1988). Therefore, it would appear that educators may need to focus on treatments or classroom instructions that perpetuate rather than stifle equality, liberty, and efficiency. Educators most hone their skills and be cognizant not only of content and delivery, but also of the receptivity of students in light of their own individual preferences and those of their students in order to enhance learning and ultimately achievement.

Differential treatment of individual preferences by educators is founded in the nature/nurture debates spawned by Locke (1693) and Rousseau (1948). Locke's theory of development acknowledged factors extrinsic to the individual which impact individual preferences (Dunn, 1987). In his theory, Locke likened a child's mind to a blank slate, tabula rasa. His theory maintained that a child develops through experiences which are influenced extrinsically through repetition, rewards and punishments, imitation, and associations. In general, Locke had full faith in external forces to develop and socialize children.

Rousseau's theory incorporated factors intrinsic to the individual which impact individual preferences (Martin & Gaddis, 1989) and was founded on the premise of letting nature take its course. His theory posited the idea that children develop according to an intrinsic timetable. Rousseau has been regarded as the "father of developmental psychology" (Crain, 1985, p.9), theorizing that children progress through a sequence of invariant stages of development. Generally, Rousseau believed children should be allowed to use the various means they have developed in dealing with their world, such as personal experiences.

A child's world, or personal experiences, centers largely around home and school which provide the majority of personal experiences from which children draw upon when dealing with their world. Many factors have been identified as moderators of the school environment (Wang, Haertel, &

Walberg, 1990) and include designs for learning and individual characteristics of students and teachers. Some of the factors associated with designs for learning include classroom management, quantity and quality of instruction provided by the teacher, and monitoring student progress (Wang, et al., 1990). These factors are determined by the deliberate choices made by each individual teacher in the classroom.

Individual characteristics of students and teachers also moderate school environment. Social as well as academic interactions of students and teachers impact the degree and intensity to which students are engaged in learning, ultimately impacting student achievement in the classroom (Wang, et al., 1990).

Ultimately, the interaction of students and teachers in the classroom creates an environment in which student achievement and learning take place. A factor that bridges both the characteristics of teachers and students is personality type theory. According to personality type theory, the classroom environment a teacher creates is a result of two factors, the personality of the teacher and the classroom structure (Kagan & Smith, 1988). Personality type theory (Kagan & Smith, 1988; Lyon, 1985; Schurr, Ruble, Henriksen, & Alcorn, 1989; Stice, Bertrand, Leuder, & Dunn, 1989) implies that there are differences in teacher delivery methods and assessment strategies because of personality preferences.

The learning styles of students as well as their individual personality are important factors to be considered when classroom environments are being examined (Allen, 1989). Personality type theory, when applied to children, implies differences in each student's information accessing and processing strategies as well as information assimilation, all of which affect their learning and, ultimately, achievement (Murphy, 1986).

Statement of the Problem

Traditionally, the foundation of the American educational system has been efficiency, equality, and liberty. But, given the diversity in this nation, an educational environment in which homogeneous educational treatments are provided for heterogeneous student groups supports efficiency but will not likely result in equality and liberties.

The research on learning styles and pedagogy indicates that different factors impact the learning environment and therefore different strategies are needed to achieve student learning (Allen, 1989; Dunn, 1987; Kagan & Smith, 1988; Murphy, 1986; Wang, et al., 1990). Personality type theory implies that there will be differences in behavior because of an individual's distinct preferences. For teachers, differences in instructional delivery methods, classroom structure, and assessment strategies result (Kagan & Smith, 1988). When applied to students, differences in learning

styles, in each student's information accessing and processing strategies as well as information assimilation result (Allen, 1989; Murphy, 1986).

Recognition of differences in learning styles and their impact upon student success is unknown. Differences in student achievement gains may be related to the opportunity to employ preferred learning styles and teaching functions and attitudes by both students and teachers in the classroom. Unanticipated student achievement or failure may be a result of the interaction of personality types of students and teachers. This study proposes to examine this relationship.

Purpose of the Study

The purpose of this study was to examine the relationship between teacher personality type and student personality type and the impact of that relationship upon student achievement in the classroom. In particular, the gain in student achievement will be examined in terms of matches and mismatches in teacher and student personality type.

Research Objectives

The following research objectives serve to focus the study:

1. Establishment of achievement gain scores of the students.

2. Identification of the personality type of students in the teacher's classes.

3. Identification of the personality type of teachers.

4. Correlation of teacher personality, student personality, and achievement gain scores.

5. Establishment of the strength of the relationship of teacher personality, student personality, and achievement gain scores.

6. Generation of advice for practice.

Theoretical Framework

The study of personality had its origins in the psychoanalytic theories of Sigmund Freud. Freud's theories tied behaviors, particularly unconscious behaviors, to sexual motivations. A colleague of Freud, Carl Gustav Jung, initially supported many of Freud's ideas, but eventually parted ways with Freud in 1913 (Crain, 1985) and began to focus on behaviors in regard to religious and spiritual motivations in order to explain the psychological types of individuals.

Jung (1933) identified an individual's psychological type as the preferred mode used in decision making and the processing of information. According to Jungian theory, individuals possess a dominant bipolar attitude, or way of interacting with the world, extraversion or introversion (E or I). One of two primary functions is the way the world is perceived, sensation or intuition (S or N). The other

primary function is represented by thinking or feeling (T or F) and is the judgment function, or the way people make decisions. The habitual function, or attitude, an individual employs generally demonstrates an individual's preference that is determined by the strength demonstrated (Jung, 1933).

Using the theories developed by Jung, a mother and daughter team (Katharine Briggs and Isabel Briggs Myers, respectively) developed the Myers-Briggs Type Indicator (MBTI) for identification of adult and adolescent personality preferences (Myers, 1962). With the recent advent of the Murphy-Meisgeier Type Indicator for Children (MMTIC) psychological type is used to study preadolescent children (Fourqurean, Meisgeier, & Swank, 1990). One of the purposes of the MMTIC is to facilitate the under-standing of children by adults as well as to provide a tool for children to use in understanding themselves. Other uses of the test include an indicator to increase individual perceptions and self-esteem and an assessment vehicle for research in child development. Murphy and Meisgeier have recommended using this assessment device as a dimension in the overall evaluation of a child's development (Meisgeier & Murphy, 1985).

Procedures

The use of human subjects in this study was approved by the Institutional Review Board at Oklahoma State University.

A copy of the approval is included in Appendix A. The following sections outline elements necessary to operationalize the study.

Data Needs

To meet research objectives, data must provide a gain score based upon two measures of student achievement: one measure at the onset of the study and the second measure at the conclusion. Other necessary data are a measure of student personality and a measure of teacher personality based upon the same theoretical constructs.

Subjects

The scope of the study was limited to 88 fourth grade students and five fourth grade teachers of these students in one suburban, midwestern elementary school. The teachers and students were in self-contained classrooms within the same school district, within the same building in one midwestern state.

Instrumentation

Three instruments were used to collect data for the study. The Iowa Test of Basic Skills (ITBS) was used to establish gain scores in student achievement. Student achievement was measured in terms of raw scores on the vocabulary, reading, language total, work study total, mathematics total, social studies, science, and composite

scores of the ITBS. The MMTIC was used to measure psychological type in students, and the MBTI was used to measure psychological type in teachers.

Iowa Test of Basic Skills (ITBS). The ITBS is an instrument that "provide(s) for comprehensive measurement of growth in the fundamental skills: listening, word analysis, vocabulary, reading, the mechanics of writing, methods of study, and mathematics" (Hieronymus, Hoover, & Lindquist, 1986, p. 3). The instrument is a paper and pencil test. Answers for the third grade level are recorded by students in answer booklets. Fourth grade students record their answers on computer scoring sheets.

The ITBS was administered in a controlled environment in a four day schedule as suggested by the administration manual (Hieronymus, Hoover, & Lindquist, 1986). Tests for both the third and fourth grade students were machine scored by the provider of the tests.

Psychological Type. The Myers-Briggs Type Indicator (MBTI) and the Murphy-Meisgeier Type Indicator for Children (MMTIC) are the instruments of choice to establish psychological type of teachers and students, respectively, in this study, and both instruments are based on Jung's personality type theory. The MBTI and MMTIC are both self-report, paper and pencil instruments designed to measure psychological type in adults and children respectively. Additionally, ". . . there were sufficient similarities to

support the position that the MMTIC and the MBTI measure similar traits" (Murphy, 1986, p. 97).

Timeline

The study used achievement test scores of the ITBS of participant children as third grade students. The test was administered in April, 1991. Test scores of these same children as fourth grade students were obtained from test administration in April, 1992.

The MMTIC was administered to fourth grade students in the spring of 1992, in the regular classroom setting. Administration of the MMTIC followed within three weeks of the ITBS administration. The MBTI was administered to all fourth grade teachers of these students during the same period of time.

Analysis

The design of this study was correlational. Using the Pearson product moment, relationships were examined between gain scores and personality types. Additionally, the strength of the relationships were determined by computing the differences of scores of the teacher and student personality measures. The greater the differences in the scores of the teacher and student personality measures, the more unlike the student and teacher were in each of the personality measures.

Significance of the Study

Theory is the formulation of principles which serve to explain existing phenomena. Theory is also the foundation upon which research is based. Contained in the literature are bipolarities of the human nature debate (Fourqurean, et al., 1990). One side purports that external factors influence student achievement and the opposing view purports that student achievement is affected from within the student. This study examined this 'human nature' debate in social-scientific theory (Burrell & Morgan, 1988).

Psychological type was also examined in this study; that is, the innate bipolar preferences of individuals, as well as how an individual responds in a given situation based on these innate preferences. The study examined the influence of student personality and teacher personality on student achievement in the classroom. The outcomes of this study support or refute Jung's psychological type theory.

One of the constructs of this theory is that learning is based on the ability of the learner to employ preferred modes (Jung, 1940). The outcomes of this study are useful to elementary school children and clarify use of preferred learning mode as a factor in the manner in which children assimilate.

Whether or not Jungian psychological type theory is supported as having an impact on student achievement has ramifications for both research and practice. If a link is

found between student achievement and type theory, one of the implications would be to include psychological type testing as part of a student's profile/permanent folder and to incorporate this information as part of the instructional delivery methods within the classroom. Support of type theory would also suggest incorporation of its use in teacher preparation programs, particularly in methods courses and educational psychology coursework. Implications would exist to update staff development programs in order to inform experienced teachers about techniques to incorporate teaching strategies in the classroom which would allow students to employ their preferred functions and attitudes.

Summary

The conflict of homogeneous treatments of heterogeneous groups is central to the issues of efficiency, equality, and liberty. Personality type theory acknowledges the preferences of individuals which can ultimately account for educational success. Given the reality that personality type theory impacts the behaviors of both students and teachers, educators must strive to balance their own personality preferences, their own preparation and instructional dissemination skills with the psychological, biological, and sociological needs of their students. Awareness of the factors affecting classroom climate and learning should enhance an educator's ability to do this. Sensitivity and an awareness, on the part of both students

and teachers, to the unique components of an individual's personality can enhance not only self, but be directly linked to productivity, and in particular student achievement, in the classroom.

Reporting

This study is organized into five chapters. Chapter I, has introduced the study, established the problem, purpose, research objectives, and theoretical framework. Chapter II examines the relevant, related literature. Chapter III describes in greater detail the methods and design, and present the data. Results of analyses are presented in Chapter IV. The study concludes with Chapter V which focuses on implications and recommendations for research and theory as well as generates advice for practice.

CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this study is to examine the relationship between teacher personality type and student personality type and the impact of that relationship upon student achievement in the classroom. The literature reviewed will be presented in five sections. The first section identifies broad contextual variables found in the literature that have been shown to moderate school environment. The second section presents the theoretical and psychological foundations of type theory. The third section presents literature which links personality type theory and studies of teacher behavior. Contained in the fourth section is the literature linking personality type theory and studies of student behavior. The fifth and concluding section provides the direction of this study.

Student Learning Environment

A number of correlates have been identified as moderators of the school learning environment. A conceptual framework was developed by Wang and others (1990) in a content analysis of review literature which identified the six following concepts as broad categories of variables

related to school learning: 1) state and district variables (relative to school governance and administration), 2) out-of-school contextual variables (relative to the environment in which the school operates), 3) school-level variables (relative to local school culture/climate), 4) student variables (relative to individual students), 5) program design variables (relative to curricular and physical designs for instruction), and 6) implementation, classroom instruction, and climate variables (relative to operationalizing curricular and instructional designs for learning).

These six broad categories evolved from 30 scales and 228 separate items. After checking univariate frequency distributions for each of the separate items, the means, standard deviations, and alpha reliabilities were calculated for the six concepts and 30 scales.

Included in the state and district variables are school environment, curricular designs, operationalizing designs for learning, and individual characteristics of students and teachers. Additionally, proximal psychological variables which influence learning have been identified (Wang, et al., 1990) and include metacognition, classroom management, student/teacher interactions, quantity of instruction, classroom climate, and peer group influences. A summary of their findings follow.

School Environment

School environment has been examined in a variety of contexts. Bi-lingualism (Fillmore & Valdez, 1986) has been examined in terms of general effectiveness studies (Cziko, 1978; Modiano, 1973). In the curricular area of reading (Cziko, 1978; Modiano, 1973), it was found that students taught in their first-language experience fewer difficulties and greater successes when the tasks of reading and learning are not confused.

Class size has been examined in terms of student achievement (French, 1993). Findings indicated that teachers reported less use of undesirable teaching behaviors when class size was reduced but the quality of education would probably not be improved with reduced class size (French, 1993).

Observational fieldwork relating environmental cultural perspectives in the context of social settings have been examined (Erickson, Florio, & Buschman, 1980). Reflected in the findings (Erickson, et al., 1980) are the notions of social action in specific settings, meanings and implications of the social actions, the social structure and learned cultural perspectives for actions, macro and micro social structures, and the transfer of everyday happenings to a variety of other settings. The human meanings of what transpires in the environment are rooted in the context of culture and the macro and micro environment (Erickson, et al., 1980).

Organizational strategies of learners have been examined in terms of the role learners play as active participants. In a research study (Moely, Olsen, Hawles, and Flavell, 1969) children, ranging from 5 to 11 years, were observed. The children were asked to memorize pictures and then asked to reorganize them. The findings indicated that the children did not reorganize using taxonomic categories. A subsequent study indicated the inability to employ such organizational strategies may be due to a lack of available strategies or what Flavell (1970) labeled as production deficiency.

Organizational, or cognitive strategies, of students have continued to be studied (Hodes, 1992) with findings supporting the use of dual decoding in memory evoking tests. The data indicated a moderate interaction of verbal and visual variables to evoke memory. These findings suggested that effective teaching may be a result of a combination of cognitive strategies.

An additional study (Phye, 1992) examined the integration of encoding and retrieval processes. The findings suggested the need to focus on theory rather than continue to explore prior knowledge and the transfer of that knowledge to academic problem solving. Acknowledgement by Phye (1992) of a shift from an objective to a subjective view seems apparent with the suggestion made in the study of an expanding theoretical basis for the resultant shift.

Parental involvement as a component of the school environment has also been examined. Parents in the Perry Preschool program and the Parent Education Follow Through Program (PEFTP) (Gordon, 1969) have been shown by researchers to have more positive attitudes and higher expectations for their children than parents in the control groups. Longitudinal studies (Schweinhart & Weikart, 1980) continue to follow the children in the Perry Preschool program with apparent positive effects of parental involvement continuing.

Parental involvement in education continues to be explored in a comparison of research studies by White, Taylor, and Moss (1992). The authors state, ". . . there is no convincing evidence that the ways in which parents have been involved in previous early intervention research studies result in more effective outcomes" (White, et al.,1992, pp. 91).

The impact of mainstreaming (Bryan, 1982; Kaufman, Agard, & Semmel, 1985) on the total school environment points to the poor achievement and lack of acceptance of mildly handicapped children in regular grades. It was found that achievement of the mildly handicapped child was not necessarily enhanced by mainstreaming while the social effects for the child that was mildly handicapped included rejection from the other children. Further research is needed to explore the complexity of rejection (Bryan, 1982).

Curricular Designs

Curricular designs have been identified as variables which influence student achievement and learning. A dominant design is mastery learning which, by design, requires the mastery of predetermined objectives before the learner proceeds to the next objective. Mastery learning has been reviewed by Block and Burns (1976) through a comparison of the results of six earlier studies which indicate support, albeit not conclusive, for the use of mastery learning.

Specific content areas within the curriculum, such as reading, have been examined in the context of student achievement. In the curricular area of reading, a qualitative study of teacher expectancy (Goldenberg, 1992) examined the effects of teacher expectancy and a student's achievement in reading. The findings pointed out the limitations of the expectancy theory and the fact that what a teacher does matters more that what a teacher expects.

Mathematics achievement was examined by Good and Grouws (1975). Their findings indicated that poor management and low effectiveness, on the part of teachers, were identifiable by observers. However, those indicators did not necessarily denote teachers who have or do not have the ability to maximize student achievement in mathematics.

In a content analysis of research literature pertaining to curricular design, a mean of 1.88 with a reliability of .89 was found to have a positive "moderate relation to

learning" (Wang, et al., 1990, p. 34). In summary, the research tends to support the fact that school environment impacts student achievement.

Designs for Learning

The structure of classroom settings also positively impacts student achievement in the classroom. The way teachers organize classes for instruction was examined by Dreeban and Barr (1983) by studying 15 first grade classes in terms of groupings of student aptitude, size of grouping, and whole group instruction. Their findings indicated that the mean aptitude of groups impacted the pace of instruction. Additionally, there was an impact on the educational progress of students when less capable students were placed with more capable students. In this instance, the findings indicated that less capable students make greater educational progress when they are placed with more capable students. Further empirical support of collaborative learning in relation to the development of logic and resolution of cognitive dilemmas was examined by Perret-Clermont (1980) through a series of reasoning tasks.

Collaborative interactions have been examined (Barnes & Todd, 1977; Collins, 1983) in terms of interactions in reading groups. The findings indicate the necessity to distinguish between semantic relations and explicit realizations. In other words, collaborative techniques should take into account the interactions of a student and

peers as opposed to student and teacher. These studies point to the difficulty in quantifying the semantic devices used by children.

In a study examining the effects of the nongraded elementary school, achievement effects of the nongraded elementary school show positive and consistent effects in student achievement (Gutierrez & Slavin, 1992) in cross grade groupings for one or many subjects. The findings indicate that positive achievement in nongraded elementary schools will result when used as a framework to allow teachers to provide direct instruction.

Studies which have categorized questions and the questioning techniques of teachers, another learning design, (Berlinger, 1976; Gall, 1970; Mehan, 1979) point to the probable importance of scaling questions to cognitive difficulty but point to the imprecision to quantify such observations in research.

Differences in the teaching techniques teachers employ within a given design for learning have also been studied as positive moderators of student learning and achievement. For example, differences in teaching techniques have been reviewed by Snow and Yalow (1982) in terms of the aptitude of the student. In general, the findings suggest that the methods of instruction on the part of the teacher differ in relationship to the aptitude of the student. The findings suggest that teachers make accommodations for differences in students. Children trained in terms of general strategies,

rather than discrete skills, were found to retain skills and training (Willis, Blieszner, & Baltes, 1980) for up to several weeks. In general, learning and memory skills can be taught and students can be made aware of the transfer process to situations in general (Glaser, 1984).

Individual Characteristics of Students and Teachers

Individual exceptionalities of students have been explored in terms of self-regulatory factors and subsequent student academic achievement (Zimmerman, Bandura, & Martinez-Pons, 1992). This study noted the need to explain the "substantial variance" (Zimmerman, et al., 1992, pp. 674) in student achievement in subsequent research.

Student participation in the classroom has also been found to be critical to learning (Finn & Cox, 1992). In a sample of 1,388 fourth grade students, Finn and Cox (1992) positively linked student participation and academic success in the classroom.

In an examination of the cognitive inference strategies of fifth grade children, Neuman (1992) found similar patterns employed in both print and video forms. The findings tend to suggest the medium of presentation may have minimal influence on learning and cognitive strategies.

Teacher behaviors were examined in terms of stability (Meyer, Linn, & Hastings, 1991). Behaviors examined included instructional interactions and reading activities. There was general stability found for teacher behaviors

(Meyer, et al., 1991) pointing out the need to examine specific behaviors, such as interactions with students, that support the fact some teachers are more effective than others in enhancing student academic success.

Summary

The fact that teachers made a positive impact on student learning is fundamental to the knowledge base from which Wang and others (1990) have developed a meta-review and analysis of literature in this area of educational research.

Based on their findings in the meta-review and analysis of the literature, Wang and others (1990) found the factors which have the greatest impact on schooling were proximal psychological variables. In rank order the proximal psychological variables with the highest ratings were: metacognition, classroom management, student/teacher interactions, quantity of instruction, classroom climate, and peer group influences.

The metacognitive variables were identified by Wang and others (1990) as having the highest mean rating of the 20 scales with a reliability of .91 and mean rating of 2.08. Included in the area of metacognition were the monitoring of comprehension (for example, testing) and self-regulation (for example, behavior towards peers). Classroom management, student/teacher social interactions, quantity of instruction, and classroom climate were identified as having

the next highest mean ratings of 2.07, 2.02, 2.02, and 2.01 respectively. Reliabilities of the ratings in order were found to be .98, .73, 94, and .99. These variables reveal the greatest influences on learning and reflect an educational environment "appropriate to the needs of individual learners" (Wang, et al., 1990, p. 35).

Specifically the study states, "individual differences among students have long been recognized as critical determinants of learning outcomes" (Wang, et al., 1990, p. 37). Personality (Jung, 1923) has been identified as individual differences.

Foundations of Personality Type Theory

"Personality" has been defined by Jung (1923) as the soul, distinguishing it from the psyche, which he defines as the collectivity of all psychic processes, both conscious and unconscious. Personality is further defined by Jung (1954) as "Tao." Tao is from classical Chinese philosophy which describes the way to the individual's interior in terms of water flowing into one's wholeness or fulfillment. Temperaments, or types, were the classifications of similarities and dissimilarities into gradations between the two poles of human behavior (Jung, 1923).

The wholeness of an individual is expressed through personality (Jung, 1954) that is formulated early in a child's development, and influenced by parents and teachers. Individuals, influenced by environmental factors, develop

from an unconscious state to a conscious state. What is unconscious (Jung, 1954) remains unchanged. The culmination of the development of an individual's personality is the process Jung identified as individuation.

According to Jung's (1923) theory of psychological types, individuals possess two means (or functions) of perceiving and two means (or functions) of judging their environment for meanings and possibilities whereas in the intuitive process, an individual looks within to examine meanings and possibilities. Jung has identified two judging processes as thinking (T) or feeling (F). An individual who employs the thinking process exercises objective reason while an individual who employs the feeling process utilizes subjective judgments. Individuals possess both means of perceiving as well as both means of judging, however a preferred mode of functioning develops.

Two attitudes, or ways of dealing with the environment, in individuals have also been identified by Jung (1923): extraversion (E) and introversion (I). Extraverts tend to deal with their environment by a responsiveness to external objects or events while introverts may be perceived as setting up barricades between themselves and outside influences. Jungian theorists (Dilley, 1987) believe individuals possess a preference for employing a perceiving (P) process or a judging (J) process.

The mental functioning of individuals is what gives rise to the Jungian theorists (Myers, 1962) theoretical

framework to explain personality differences. These personality differences are noted by Jungian theorists in terms of perception and judgment. Perception is ". . . understood to include the processes of becoming aware. . ." (Myers, 1962, p. 51) while judgment ". . . include(s) the processes of coming-to-conclusions about what has been perceived" (Myers, 1962, p. 51).

Two methods of perception, sensing (S) and iNtuition (N) have been identified by Jung (1923). The sensing (S) method of perception is employed when an individual makes use of the five senses. INtuition (N) draws upon innate, unconscious perceptions.

Two methods of judgment, thinking (T) and feeling (F) (Myers, 1962), are the processes whereby individuals arrive at conclusions. The thinking (T) method implies an objective and impartial means of reaching conclusions while the feeling (F) method implies a subjective and personal means of reaching conclusions.

As children mature, their personalities develop based upon their preferred means of mental functioning by combinations of perception and judgment. So the perception of sensing could combine with thinking (ST) or sensing could combine with feeling (SF). The perception of iNtuition (N) could combine with thinking (NT) or iNtuition (N) could combine with feeling (NF).

An additional distinction in an individual's utilization of perception and judgment relates to

introversion (I) and extraversion (E). Introversion (I) is an individual's preference for dealing with the world through reflection, possibilities, and concepts. Extraversion (E) is an individual's preference to act upon the world, dealing from without the individual. Introversion (I) or Extraversion (E) can combine with any of the four combinations of perception (S or N) and judgment (T or F), giving rise to the following preferences: IST, EST, ISF, ESF, INT, ENT, INF, or ENF.

The two remaining preferences, judgment (J) and perception (P) rival one another (Myers, 1962). When an individual employs Judgment (J) as a way to come to a conclusion, the choice has been made with finite, concrete evidence. Individuals choosing the process of Perception (P) as a way to come to a conclusion, consider infinite, abstract possibilities. The preferences of judgment (J) or perception (P) can combine with any of the above eight combinations, giving rise to the 16 personality types (Myers, 1962) as follows: ISTJ, ISTP, ESTJ, ESTP, ISFJ, ISFP, ESFJ, ESFP, INTF, INFJ, ENTJ, ENTP, INFJ, INFP, ENFJ, and ENFP.

Psychological type theory (Dilley, 1987) has to do with the basic mental processes of a person from birth to death. According to Dilley (1987), the patterns are relatively stable and are known as types. The functions and attitudes identified by Jung and Jungian theorists can be combined into 16 patterns. Commonalities and differences of

personality types, identified by Jungian type theory, are described by Kiersey and Bates (1978), Lawrence (1984), Myers (1980), and Myers and McCaulley (1985).

Type Theory and Teacher Behaviors

Based upon the theoretical constructs of Jungian type theory, Myers (1962) and Briggs developed the MBTIC to identify adult and adolescent personality preferences. Research utilizing the MBTIC has applied the Jungian theoretical constructs to the field of education with orientations toward teachers and/or adult and/or adolescent students. A review of the literature relating teacher behaviors and student achievement follows.

The notion of teacher personality as a component of teacher competency was conceptualized by Ornstein (1986) and has been defined in terms of three categories: teacher style, teacher behavior, and teacher effectiveness. Personality type of a teacher is linked to teaching style. Ornstein's (1986) conceptualization identified teacher effectiveness as well as linked teacher behavior and student achievement.

Teacher Styles. Multiple types of teaching styles were identified by Riessman (1967) with no "ideal" type of teacher emerging while Biddle (1964) proposed a cause-effect model and identified "teacher properties," or personality traits, as a sequence in teacher behavior/teacher effects. Others have identified characteristics of teaching behavior

(McNergney & Carrier, 1981; Ornstein, 1978). There has been a lack of agreement in teacher characteristics impacting teaching style.

In a correlational study of teacher personality types and theoretical orientation to reading, Stice and others (1989) found patterns in teacher behaviors using a correlation matrix of personality teaching orientation measures. Three theoretical orientations to reading were identified: 1) phonics/decoding/mastery learning, 2) skills/traditional/ basal readers, and 3) whole language. Implications of the study suggested personality characteristics and beliefs may impact teacher decisionmaking more than teacher preparation courses or the instructional delivery methods the teachers had received as students.

In an attempt to explain the negative attitude elementary teachers have, overall, toward science, Conwell, Helgeson, and Wachowiak (1987) suggested personality type as a possible factor. The study produced "scattered findings" and suggested that match/mismatch of teacher style to cognitive style were "difficult to capture." The sample involved 56 elementary education majors and strength of type preference was disregarded.

Additionally, variability of scores on the National Teacher Examination has been related to personality variables (Schurr, et al., 1989). The study found that personality variables explained a statistically significant

percentage of variance in the areas of communication skills and general knowledge in the National Teacher Examination. There was a positive correlation between teacher personalities and approach to classroom structure (Kagan & Smith, 1988). This study related the classroom structure of kindergarten, whether child-centered or teacher-structured to, among other items, the teacher's score on the MBTI. Significant correlations were found indicating a relationship between classroom structures and teacher personality types.

Teacher Behaviors. The MBTI has been employed as an instrument to study the behaviors of teachers and prospective teachers in school settings (Boreham, 1987; Conwell, et al., 1987). Problem solving behaviors were studied by Boreham (1987) in relation to personality differences which influence behaviors in causal analysis. The study found a significant relationship between sensing and intuitive types and diagnostic problem solving. Understanding psychological type can explain biases in diagnostic problem solving skills as well because the conceptual framework of learners will become more complex with an understanding of personality type preferences (Boreham, 1987). The relationship of mismatching/matching cognitive type (SF/JP) in relationship to science teaching and attitudes was examined by Conwell and others (1987). The research produced mixed results because of scores occurring mid-range.

Teacher Effectiveness. Other teacher effectiveness studies have focused on student achievement and teacher behaviors (Brophy, 1981; Gage, 1978; Good, 1979; Medley, 1979; Rosenshine & Furst, 1971). Correlational designs were employed in the studies of Gage (1978), Medley (1979), and Rosenshine and Furst (1971) and each examined the relationship between student achievement and teacher behaviors. Findings in all of these studies supported the existence of a positive relationship between student achievement and teacher behaviors.

In summary, studies of teacher effectiveness have focused on a variety of quantifiable actions on the part of teachers. These actions have included teaching styles, teacher behaviors, and teacher effectiveness. Quantifiable relationships have also been found to exist between student achievement and teacher actions.

Type Theory and Student Behaviors

Upon their initial entry into school, children are psychologically by-products of parental influences (Jung, 1954). According to Jung, psychological difficulties which children possess at this age can most surely be attributed to the parents.

The developmental stages of personality were identified by Schemel and Borbely (1982) as follows: "A person is undifferentiated until about age six. From ages six to 12 the Dominant develops; from age 12 to 20 the Auxiliary

develops; from 20 to 35 the Tertiary develops; from 35 to 50 the Inferior is developed" (p. 13). Recognition and an understanding of the developmental stages of personality can provide educators with alternative perspectives and strategies in the teaching of students.

Indirect genetic effects of temperament have been found to impact learning (Martin & Gaddis, 1989). Achievement and temperament scores were obtained from subjects in first grade and again in fifth grade. The findings supported the hypothesis that temperament impacts learning. A moderate relationship between personality variables and achievement in both Anglo-American and Mexican-American children has been found (Knight, 1982). These studies support the fact that findings remain mixed as to whether temperament and personality are determined organically or inorganically.

Some studies have shown that the MBTI may potentially predict academic success for selected groups of college students (Hengstler, 1981). Other studies have supported the relationship of student achievement and personality type (Dutrow & Houston, 1981; Hakstian & Gale, 1979). These studies provide evidence of the relationship of student achievement and personality type in adolescent and adult students.

Conscious use of psychic systems of adaptation, on the part of educators, was advocated by Jung. Additionally, Jung believed educators should develop a sensitivity to the child's psychological development as well as the child's

cognitive development. These adaptations should be appropriate to the child's level of maturation. Educators play a critical role in a child's development not only in the area of curriculum, but also in the development of personality. According to Jung, the role of the educator in the development of a child's personality is at least as important, or possibly more important, than actual teaching. The educator's role in school is two-fold, Jung believed: the teaching of a curricular education as well as a psychological education. The psychological education of the child is influenced by the teacher's personality (Jung, 1954).

Three kinds of education have been identified by Jung (1954): education through example, collective education, and individual education. Education through example is the unconscious impact of environmental influences on the child, for example the unspoken messages and examples of parents. Collective education means not only education in schools, but includes a broader conceptualization which encompasses the collective norms in society. Individual education, according to Jung, is developing the uniqueness of each child.

Use of Jung's psychological type theory with elementary school age children has been limited (Golay, 1982; Hanson & Silver, 1984; Lawrence, 1979; McCaulley & Natter, 1974) because of the lack of an instrument based upon the Jungian constructs. Murphy (1986) developed the MMTIC based upon

Jung's type theory as an instrument designed to measure Jung's theoretical constructs of type personality in children.

Attempts have been made to link learning style and Jungian psychological type (Fourquean, et al., 1990). The findings indicated a possible connection between concepts, however the constructs upon which learning style and psychological type were based were different. Learning style constructs incorporate extrinsic influences which impact student learning, while psychological type constructs acknowledge intrinsic influences which impact student learning.

The Minooka study (Allen, 1989) has explored the incorporation of psychological type testing based on the MMTIC in the development of instructional strategies for students. Insights gained in this study have been incorporated in an overall plan of school improvement. Those insights included focusing not only on the academic needs of students but the psychological needs of students as well.

Direction of This Study

The preceding research has linked the "proximal psychological variables" (Wang, et al., 1990) of student behaviors and learning as well as teacher behaviors and learning. In this study, the integration of the two variables, that is student behaviors and teacher behaviors

and their impact on student learning, was what Wang and others (1990) have identified as the psychological variables that obtained among the highest rating, ". . . . student/ teacher interactions represent an important constellation of variables related to effective instruction" (p. 37). The identified psychological variables of student/teacher interactions were further refined and examined in this study by exploring the relationship of the bimodal preferences of students and teachers as manifested in student achievement.

Summary

Given these realities, that is the link between student behaviors and learning as well as teacher behaviors and learning, educators must strive to balance their own personality preferences as their own preparation and instructional dissemination skills with the needs of their students. Awareness of the factors affecting classroom climate and learning should enhance an educator's ability to do this.

Differences in the gain in student achievement may be attributed to the opportunity to employ preferred learning and teaching functions and attitudes by both students and teachers in the classroom. The purpose of the study was to examine the relationship between student achievement and the interaction of personality types of students and teacher.

CHAPTER III

PRESENTATION OF THE DATA

This chapter will begin by profiling the procedures of the study. A description of the instruments and general description of the computational procedures will be presented, then the data.

Procedures

The Oklahoma State University Institutional Review Board was presented with a research proposal for this study requesting an exempt review for research of human subjects, thereby providing assurances that the rights and welfare of human subjects were properly protected. Approval was granted to conduct this study. (See Appendix A for Oklahoma State University Institutional Review Board approval.)

Subjects

All fourth grade students and their teachers in a suburban, midwestern elementary school were invited to participate as subjects of the study. Students and teachers had been randomly assigned to five classrooms of approximately equal size by the building principal at the start of the school year. Parents were asked to allow their

child to take part in the study. Teachers were also asked to participate in the study. All subjects (112 students and 5 teachers) consented to participation (See Appendix B).t

There were 56 male fourth grade and 56 female fourth grade subjects. The five teachers were all female, two of whom were first year teachers while the remaining three were experienced, career teachers with 10 to 15 years in the classroom.

For the purpose of the study, the data obtained from students not under the direct instruction of the regular classroom teacher for the majority of the school day were disregarded. Data from 14 subjects identified by the district as students with mental handicaps and/or learning disabilities who were not instructed by the regular classroom teacher the majority of the school day were also disregarded. Incomplete data from an additional 10 students resulted in their exclusion from the study sample. Therefore, data from 88 students were used in the study.

The focus school has a student population of 493 students in grades one through four. During the time the study was conducted, the school ethnic makeup was: 58% were white, non-Hispanic; 4% were black; 1% were Hispanic; and 37% were Alaskan or American Indian. These data were reported on the school accreditation report.

Timeline

As part of the regular testing program, student

subjects were administered the Iowa Test of Basic Skills (ITBS), level 9, form J, at the end of the third grade year. At the end of the fourth grade year the student subjects were administered the ITBS, level 10, form G.

After permission to test was obtained, the Murphy-Meisgeier Type Indicator for Children (MMTIC) and the Myers-Briggs Type Indicator (MBTI), form G, were administered to fourth grade students and their teachers, respectively, at the end of the fourth grade year.

The ITBS and the MMTIC were administered to all subjects in their classrooms under controlled group conditions according to the procedures outlined in the test manuals (Hieronymus & Hoover, 1986; Meisgeier & Murphy, 1985). The ITBS was administered to students by their teachers. The MMTIC was administered by the researcher. The MBTI was administered according to the procedures outlined in the test manual in an individual self-paced setting (Myers, 1962).

Instrumentation

A description of the instruments of choice follow in this section. Included is the testing time, format for responses, number of items, reliablity, and other norm technical data to support its use in this research.

Iowa Test of Basic Skills. The complete test battery for both level 9 and 10, was administered to the subjects over a five day period, according to Plan A outlined in the

test manual. A summary of Plan A and the working time for the areas of testing is as follows:

Area of Testing (both levels)	Working Time (both levels)	Number of Items (level 9)	(level 10)
V: Vocabulary	15	30	36
R: Reading	42	44	49
L-1: Spelling	12	30	36
L-2: Capitalization	12	28	29
L-3: Punctuation	14	28	29
L-4: Usage & Expression	30	33	36
W-1: Visual Materials	40	33	36
W-2: Reference Materials	25	33	39
M-1: Math Concepts	25	28	32
M-2: Math Problems	25	24	26
M-3: Math Computation	16	34	37
SS: Social Studies	35	38	40
SC: Science	35	38	40

The student taking the ITBS, level 9, form J, read an item in the testing booklet and made a response in the testing booklet. The student taking the ITBS, level 10, form G, read an item in the testing booklet and responded on the scantron form.

The ITBS was administered under controlled conditions according to standardized procedures given in the testing manual. As a result of the responses, student achievement was measured in each of the areas of testing listed above. As a note, it was standard procedure for the cooperating

school district to administer the ITBS to all students in the district at all grade levels near the end of each school year.

The standardized achievement instrument, the ITBS, has acceptable measures of both reliability and validity. Four methods of "within-forms" mean reliability coefficients are reported by Hieronymus and Hoover (1986) for subtest areas of the ITBS: equivalent forms, Kuder-Richardson 20 (K-R 20), split-halves (odd-evens), and split-half (equivalent-halves). The equivalent forms mean reliability coefficients range from .773 to .858 as the mean for individual subtests, with .809 the mean for all subtest areas. Using the K-R 20, mean reliability coefficients ranged from .844 to .912 with means of .875 reported for both forms of the tests. The split halves (odd-evens) yield mean reliability coefficients ranging from .839 to .919, with a mean of .880 and a mean of .883 on each of the two reported forms. The split-half, equivalent-halves yield mean reliability coefficients ranging from .807 to .913, with a mean of .872 on both of the two reported forms. The reliability, or consistency, in which student achievement is measured by the ITBS is indicated in the acceptable coefficients.

Predictive validity correlations of the ITBS complete composite measures are cited by Hieronymus and Hoover (1986). The studies cited yielded coefficients ranging from .41 to .91, ". . . demonstrat(e)ing a substantial relationship between basic skills performance and later measures of

academic success, even within relatively homogeneous samples" (p. 90).

Murphy-Meisgeier Type Indicator for Children (MMTIC). The MMTIC is a copyrighted instrument designed to determine Jungian types of children. The indicator affirms the child's strengths, or preferences, by measuring four preference scales: Extraversion/Introversion (16 items), Sensing/iNtuitive (18 items), Thinking/Feeling (18 items), and Judging/Perceiving (18 items).

The MMTIC reliability for internal consistency was calculated using the Spearman-Brown method. The split-half estimated reliability coefficients reported range from .62 to .75. These reliability coefficients are within acceptable parameters for an instrument of this type (Meisgeier & Murphy, 1986).

Test-retest Pearson correlations for each of the discriminant functions range from .58 to .75 (Meisgeier & Murphy, 1986). The MMTIC identified the same preferred functions of the subjects in a test-retest situation more than the majority of the time. Regarding changes in preferences, ". . . data indicate(s) that 70 percent of students did not change any preferences, and 94 percent changed no more than one preference" (p. 29).

Validity intercorrelations reflect a positive correlation of .37 and a low positive correlation of .23 in the TF and SN scales. The EI and SN scales had a correlation

of .07 while the EI and TF scales had a correlation of -.16. According to these findings, the MMTIC discriminates between discrete functions that are not strongly correlated with one another. Content validity, assessed by 21 individuals familiar with psychological type, of the MMTIC sufficiently supported the position that the instrument demonstrated psychological type and developmental familiarity of young children (Meisgeier & Murphy, 1986).

Myers-Briggs Type Indicator (MBTI). The MBTI is a copyrighted instrument based on the constructs of Jungian personality type theory. The indicator affirms the personality strengths, or preferences, in adults and adolescents by using four scales: Extraversion/ Introversion, Sensing/iNtuitive, Thinking/Feeling, and Judging/Perceiving (Myers, 1962).

The MBTI, form G, is a self-report instrument, with no time constraints. The teachers read items in the test and responded. The MBTI was administered to each of the five teacher subjects individually and contained 166 items.

As a result of the responses, the teachers were classified as Extraverted (E) or Introverted (I), Sensing (S) or iNtuitive (N), Thinking (T) or Feeling (F), and Judging (J) or Perceiving (P). Each of the teacher's preferences profiles their psychological type.

The reliability of the MBTI was reported using the Spearman-Brown split-half method. Reported correlations

ranged from .44 to .94, with the median around .65 (Myers, 1962). In an attempt to temper extreme scores, tetrachorics and the Spearman-Brown prophecy formula, another set of split-half reliabilities, were computed with coefficients ranging from .66 to .93 in the discriminant functions with the median reliability of .83. These coefficients indicate acceptable measures for a self-report instrument of this type (Myers, 1962).

Regarding the validity of the MBTI, Myers reports, ". . . type preferences are found to correlate, in appropriate directions, with interests, values, and needs ascertained by other tests. . . (and) support is afforded for the validity of the theory and the Indicator" (Myers, 1962, p. 21).

Testing Procedures

Iowa Test of Basic Skills (ITBS). Machine scoring was the method of choice to tabulate student responses. Student responses were submitted to the Riverside Publishing Company for machine scoring of both the level 9 and level 10 ITBS.

Murphy-Meisgeier Type Indicator for Children (MMTIC). The MMTIC was administered to students in each of the five, self-contained classrooms.

No time constraints were given; however 35 minutes was the approximate testing time taken by subjects to respond to the 70 items in the MMTIC. Students read an item in the

testing booklet and responded on a scantron form. The MMTIC was hand scored by the researcher under the supervision of an authorized user.

Myers-Briggs Type Indicator (MBTI). The MBTI, form G, is a self-report instrument with no time constraints. The MBTI was hand scored by an authorized user of the instrument.

Congruency Scoring Procedures

The personality instruments and the student achievement instruments both contain intrascoring dilemmas. The MBTI requires the use of score adjustment that results in a categorical rating while the MMTIC reports a different set of categorical ratings. To resolve those dilemmas, the design of the study incorporated computational procedures to convert the data into congruent scores. The computational procedures detailing the manner in which the divergent data were accommodated are described in detail in the remainder of this section.

Personality type. The MBTI yields a score for each of the polarities, eight scores in total with two for each dimension. The next step was to compute a single score on each of the four dimensions of the MBTI. The teacher's extraversion score was subtracted from the teacher's introversion score, yielding a single value for the E/I dimension. The teacher's sensing score was subtracted from

the teacher's intuitive score, yielding a single value for the S/N dimension. The teacher's thinking score was subtracted from the teacher's feeling score, yielding a single value for the T/F dimension. And, the teacher's judging score was subtracted from the perceiving score, yielding a single value for the J/P dimension.

In order to put individual preferences into perspective, Meisgeier and Murphy (1985) have established scoring bands for the MMTIC to indicate type. Meisgeier and Murphy (1985) established the following bands for the MMTIC.

35(Extraversion . . .47.7(U)52.3 . . . (Introversion)70

44(Sensing) . . . . .64.4(U)69.6 . . . . .(iNtuitive)88

42(Thinking). . . . .61.6(U)66.4 . . . . . .(Feeling)84

44(Judging) . . . . .63.9(U)68.1 . . . . (Perceiving)88

To establish the student score on the four dimensions, the midpoint score on each band of the MMTIC was taken from the student score on each of the four dimensions, resulting in an adjusted student score. (The adjusted student scores were obtained as follows: student E/I score less 50, yielded adjusted student E/I; student S/N score less 67, yielded adjusted student S/N scores; student T/F score less 64 yielded adjusted T/F score; student J/P score less 66 yielded adjusted student J/P score.)

The next step was to calculate values for the discrepancy of the teacher and student scores in order to determine the degree of which the personality of the student and teacher were alike on each dimension. These calculations

and student personality.

Achievement Scores. The following subtest scores were used from the ITBS battery: vocabulary (V), reading (R), language total (LT), work study (WS), mathematics total (MT), social studies (SS), science (S), and complete composite (CC). Because of the different number of items on level 9 and level 10, the student raw scores were translated into percentages for each subtest on level 9 and level 10.

Gain scores were then determined by taking the level 9 score from the level 10 score on each of the aforementioned subtests. Gain scores are reflected in terms of percentages of the raw score in the data section.

Data

The data section which follows describes the population in terms of student achievement ITBS scores. Findings are given by classroom aggregate (row labeled C-1 represents Classroom 1, C-2 represents Classroom 2, C-3 represents Classroom 3, C-4 represents Classroom 4, C-5 represents Classroom 5) and then aggregated for the entire population (row labeled All). Classroom 1, Classroom 2, and Classroom 5 data were collected from the classrooms of veteran teachers, having 10 years, or more, of experience. Data obtained from Classroom 3 and Classroom 4 were collected from classrooms of entry year, or first year teachers.

Gain Scores

Data from the ITBS is reported in Table 1 using the following subtest scores: vocabulary (V), reading (R), language total (LT), work study (WS), mathematics total (MT), social studies (SS), science (S), and complete composite (CC). The mean score is indicated in terms of percentages of raw scores. Table 1 profiles the student subjects aggregated classroom ITBS subtest scores at the end of the third grade year (level 9 of the ITBS) and at the end of the fourth grade year (level 10 of the ITBS).

In Table 1, for example, in the vocabulary subtest area, level 9, the aggregated student score in Classroom 1 (C-1) of 70.83% was reported, while the students in Classroom 2 had an aggregated student score of 69.44%. The achievement level of the two classrooms is very similar with a difference in scores of 1.39%. Even though the achievement level of the aggregated classroom scores is very similar, the standard deviation (SD) reported reflects greater differences in the spread of the scores in the classrooms in the above example. For instance, even though the achievement level in the vocabulary (V) subtest, level 9, is similar for Classroom 1 and Classroom 2, there is less spread of scores in Classroom 1 (SD .1208) than in Classroom 2 (SD .2330). The data in the above example (V subtest, level 9) for Classroom 2 indicates a greater spread, or more extreme scores, than are found in Classroom 1. The most homogeneous, or similar, set of scores in this example is in

TABLE 1

SUMMARY OF LEVEL 9 AND LEVEL 10 ITBS SUBTESTS AGGREGATED BY STUDY CLASSROOMS (INDICATED IN TERMS OF PERCENTAGES OF RAW SCORES)

subtest/level	V/9	V/10	R/9	R/10
	Mean/SD	Mean/SD	Mean/SD	Mean/SD
Class				
C-1	.7083/.1208	.6593/.1614	.6449/.1820	.6354/.1787
C-2	.6944/.2330	.6682/.2000	.6477/.2162	.6247/.2396
C-3	.6725/.1613	.5556/.1554	.5989/.1444	.5567/.1687
C-4	.6889/.2127	.6167/.2016	.5530/.2024	.6541/.1875
C-5	.6822/.1992	.5833/.1984	.6121/.1971	.6204/.1953
All	.6893/.1877	.6163/.1859	.6087/.1900	.6184/.1942

subtest/level	LT/9	LT/10	WS/9	WS/10
	Mean/SD	Mean/SD	Mean/SD	Mean/SD
Class				
C-1	.6303/.1415	.6846/.1098	.6548/.1115	.6825/.1433
C-2	.6176/.1592	.6859/.1337	.6120/.1459	.7067/.1701
C-3	.5872/.1097	.5950/.1469	.5724/.1628	.5926/.1382
C-4	.6667/.1588	.6692/.1423	.6126/.1694	.6578/.1492
C-5	.6269/.1545	.6264/.1550	.6384/.1606	.6619/.1659
All	.6274/.1458	.6534/.1398	.6154/.1524	.6596/.1547

TABLE 1 (Continued)

subtest/level	MT/9	MT/10	SS/9	SS/10
Class	Mean/SD	Mean/SD	Mean/SD	Mean/SD
C-1	.7253/.1188	.7513/.1345	.6431/.1192	.5563/.1157
C-2	.7203/.1616	.6754/.1499	.6345/.2298	.5806/.1866
C-3	.6957/.1439	.6304/.1594	.5867/.1386	.4044/.1112
C-4	.7027/.1306	.6787/.1419	.6065/.1778	.4679/.1683
C-5	.7078/.1685	.6589/.1650	.6504/.1574	.4717/.1595
All	.7098/.1421	.6780/.1517	.6224/.1687	.4957/.1624

subtest/level	S/9	S/10	CC/9	CC/10
Class	Mean/SD	Mean/SD	Mean/SD	Mean/SD
C-1	.5789/.1727	.5969/.1347	.6514/.1187	.6845/.1036
C-2	.6301/.2203	.5125/.1722	.6459/.1655	.6700/.1436
C-3	.5882/.2649	.4603/.0964	.6177/.1116	.5761/.1223
C-4	.5639/.2065	.5012/.1480	.6376/.1451	.6377/.1437
C-5	.6560/.1454	.5117/.1379	.6673/.1298	.6135/.1553
All	.6004/.1857	.5149/.1443	.6425/.1350	.6372/.1375

Classroom 1 because Classroom 1 has the smallest standard deviation (SD .1208).

Overall the data in Table 1 present not only the aggregated class mean in each of the indicated ITBS subtest areas, it also indicates the homogeneity of scores within each classroom. Data that might initially appear to show classrooms having similar achievement levels, as in the example in the preceding paragraph, may be impacted by extreme scores.

Gains or losses in student achievement from the third grade year (ITBS, level 9 score) to the fourth grade year (ITBS, level 10 score) are presented in Table 2 in aggregate by classroom for each of the subtest areas in the study. A positive score indicates a gain in student achievement as measured by the difference in the raw score percentage of level 9 (third grade score). A negative score indicates a loss in student achievement as measured by the difference in the raw score percentage of level 10 (fourth grade score) from the raw score percentage of level 9 (third grade score).

In the vocabulary (V) skills subtest of the ITBS, the findings in all classrooms reflected a relative loss in achievement in terms of percentages of the raw scores of the vocabulary skills subtest. The smallest mean, or average loss, was in Classroom 2 with a -2.62% loss, while the

TABLE 2

GAIN SCORES OF THE ITBS SUBTESTS
AGGREGATED BY STUDY CLASSROOMS

subtest/level	V	R	LT	WS
Class	Mean/SD	Mean/SD	Mean/SD	Mean/SD
C-1	-.0407/.1186	-.0313/.1986	.0455/.0660	.0157/.1668
C-2	-.0262/.1329	-.0230/.1127	.0683/.0698	.0947/.0687
C-3	-.1072/.1210	-.0371/.1239	.0098/.1099	.0202/.1226
C-4	-.0867/.1530	.0916/.1443	-.0014/.1012	.0452/.1093
C-5	-.0989/.1616	.0083/.0918	.0069/.0906	.0331/.0990
All	-.0720/.1393	.0052/.1440	.0250/.0924	.0436/.1161
C-1	.0260/.0646	-.0868/.1073	.0179/.1324	.0242/.0552
C-2	-.0448/.0844	-.0539/.0977	-.1176/.1774	.0241/.0638
C-3	-.0653/.1165	-.1665/.1098	-.1086/.1504	-.0345/.0761
C-4	-.0240/.1024	-.1387/.1332	-.0627/.1717	-.0060/.0663
C-5	-.0488/.1525	-.1647/.1441	-.1310/.0803	-.0314/.0803
All	-.0318/.1089	-.1205/.1247	-.0791/.1561	-.0041/.0714

greatest mean, or average loss, was in Classroom 3 with a -10.72% loss. The most homogeneous scores in the vocabulary (V) skills subtest were in Classroom 1 with the smallest standard deviation (SD .1186) of all the classrooms. The

least homogeneous groups was Classroom 5 (SD .1616). Standard deviations provide the most stable measure of variability and provide a measure to indicate the spread of scores in a population.

The reading (R) skills subtest scores of the ITBS indicate three classrooms (C-1, C-2, C-3) showing a loss in achievement gain scores in terms of percentages of raw scores while two classrooms (C-4, C-5) show gains in student achievement. The greatest spread of scores can be found in Classroom 1 (SD .1986) while the smallest spread of gain scores were reported in Classroom 5 (SD .0918).

The language total (LT) subtest scores of the ITBS indicate relatively similar stable, unchanged gains in student achievement with the smallest loss of -.0014 and the greatest gain of .0683. The standard deviation (SD) was reasonably stable through the subpopulations, ranging from .0660 to .1099.

Work study skills (WS) subtest scores demonstrate fairly diverse scores. Classroom 2 (C-2) achieved the greatest mean score gain in terms of percentage of raw score gain with .0947 while Classroom 1 showed the smallest gain in mean score in terms of percentage of raw score. The smallest standard deviation (SD .0687) was found in Classroom 2 while the greatest standard deviation (SD .1668) was found in Classroom 1.

In the mathematics total (MT) area of the ITBS, the findings in four classrooms (C-2, 3, 4, 5) exhibit a

relative loss in achievement in terms of percentages of raw scores of the mathematics total (MT) subtest. Classroom 1 showed the a gain of .0260 in student achievement and also the smallest standard deviation (SD .0646). The greatest loss in mean score gain was found in Classroom 3 (-.0653) and the greatest standard deviation (SD .1525) was reported in Classroom 5. Greatest gains or losses in student achievement are not necessarily associated with the largest or smallest standard deviations. Classrooms with similar standard deviations (SD), or the most homogeneous scores, do not necessarily exhibit the greatest gains or losses in terms of the subtest score.

Social studies (SS) subtest area of the ITBS showed a relative loss in achievement in terms of percentages of raw scores in all five classrooms. The smallest loss of achievement was reported in Classroom 2 with a mean score of -.0539 while the greatest loss occurred in Classroom 3 with a mean score of -.1665. Spread of the scores, or standard deviation, did not coincide with gains or losses in achievement. Classroom 2 reported the smallest standard deviation (SD .0977), showing about a 5% decline in achievement, while Classroom 5 reported the largest standard deviation (SD .1441). Classroom 3 reported nearly a 17% decline in student achievement. The losses reported in achievement scores did not necessarily parallel the reported standard deviations.

Losses in student achievement were reported in four classrooms (C-2, 3, 4, 5) in the science (S) subtest area of the ITBS. The greatest gain in student achievement in the science subtest was found in Classroom 1 (mean .0179). The greatest loss in student achievement in the science subtest was reported in Classroom 5 (mean -.1310) and the largest standard deviation was reported in Classroom 2 (SD .1774). Because there is not a parallel between mean scores and standard deviations, the possibility exists that a few extreme scores are not what is impacting the gains or losses in student achievement.

The complete composite (CC) subtest scores indicate Classroom 1 had the greatest overall gain in student achievement (.0242) with Classroom 2 obtaining similar gains (.0241). The standard deviation (SD) was .0552 for Classroom 1 and .0638 for Classroom 2. The largest overall decline in student achievement occurred in Classroom 3 (-.0345). Classroom 5 reported the greatest standard deviation of all classrooms (SD .0803). There is no apparent relationship between mean scores and standard deviations.

These findings indicate the possibility that homogeneity of the classroom does not necessarily have a direct positive or negative correlation with student achievement. In other words, the fact that classrooms obtained similar results does not necessarily indicate a teacher was equally effective with all students. For

example, in the mathematics total (MT), students in Classroom 2 scored a mean loss of 4.48% while the students in Classroom 5 scored a mean loss of 4.88%. Even though the means are relatively similar (.04% difference), the standard deviation in Classroom 5 (SD .1525) and Classroom 2 (SD .0844) are quite different. In other words, the achievement gains were similar in terms of percentages or raw scores, but the distribution of the scores was not as spread in Classroom 2 as the distribution of the scores in Classroom 5.

The data indicates an inconsistency in the spread of scores. Greater achievement gains are not necessarily found in classrooms where the standard deviation indicates the least amount of variability or where there is heterogeneity.

Student Personality Type

Table 3 profiles, by aggregated classroom, the mean score and standard deviation (SD) of the student subjects obtained from the MMTIC according to extraversion/ introversion (E/I), sensing/iNtuitive (S/N), thinking/ feeling (T/F), and judging/perceiving (J/P). The numbers in Table 3 are the obtained scores.

In the E/I dimension, the aggregated class score which indicate the greatest preference towards extraversion (E) was Classroom 4. The score of the five classrooms coming closest to the established score of 35 on the MMTIC scoring band was Classroom 4 with a mean score of 44.7619. The

classroom demonstrating the least preference for the Extraversion dimension was Classroom 2 with a mean score of

TABLE 3

AGGREGATED SCORES OF STUDENT TYPE

	E/I		S/N	
	Mean	SD	Mean	SD
C-1	46.9375	7.0092	65.7500	6.4859
C-2	49.0000	6.4169	65.2222	7.9005
C-3	44.9444	5.7545	63.6111	7.2448
C-4	44.7619	5.4581	65.8571	7.5052
C-5	47.8000	5.2942	66.6667	7.8072
All	46.5795	6.0983	65.3864	7.3131

	T/F		J/P	
	Mean	SD	Mean	SD
C-1	70.4375	6.1315	73.1875	9.2824
C-2	70.3889	7.8301	73.1667	12.3824
C-3	72.1111	6.7466	70.0000	9.1266
C-4	73.6190	5.3148	66.3810	8.3694
C-5	72.5333	6.3117	72.8667	6.6210
All	71.8864	6.4744	70.8523	9.5935

49.0000. None of the aggregated classroom scores indicated a student preference for introversion (indicated in Table 3, E/I column, by scoring between 52.3 and 70).

In the S/N dimension, the aggregated class scores indicated that all classes, with the exception of Classroom 3, had an undeveloped preference (indicated in Table 3, S/N column, by scoring between 64.4 and 69.6). The standard deviation (SD) indicates the students in Classroom 1 exhibit the smallest amount of variability (SD 6.4859) of the five classrooms while the students in Classroom 2 demonstrate the greatest spread of scores.

The T/F dimension aggregated class scores indicate a well developed preference for feeling (scoring higher than 66.4) with the standard deviation of scores being remarkably similar (between 5.3148 and 7.8301).

In the J/P dimension, the aggregated class scores indicated that four of the five classes (C-1, 2, 3, 5) have developed a preference for perceiving (scoring higher than 68.1). Classroom 4 has an aggregated score indicating an undeveloped preference of 66.3810 (scoring between 63.9 and 68.1).

The adjusted student scores in Table 4 were calculated by using the midpoint score on each band of the MMTIC and taking it from the raw student score from the MMTIC. The following equations were used:

student E/I score less 50=adjusted student E/I

student S/N score less 67=adjusted student S/N

student T/F score less 64=adjusted student T/F

student J/P score less 66=adjusted student J/P

Table 4 profiles by aggregated classroom the student scores according to extraversion/introversion (E/I), sensing/iNtuitive (S/N), thinking/feeling (T/F), and judging/perceiving (J/P). The numbers in Table 4 are the adjusted student scores.

In all instances, the larger the negative number of the mean score, the stronger the preference of the aggregated classroom of students towards the first polarity listed in the mean column and conversely, the larger the positive number, the stronger the preference of the aggregated classroom of students towards the second polarity listed in the mean column. For example, in the first column of Table 4, the mean score of the aggregated subject students in Classroom 4 indicates the strongest preference towards extraversion of the 5 subject classrooms, while the mean score of the subject students in Classroom 2 indicates the mildest preference towards extraversion of the five subject classrooms.

In the extraversion/introversion polarity, the data indicates, based on the mean score of the aggregated classrooms, students in Classroom 4 (C-4) have the strongest preference for extraversion of all the classrooms in the study, followed in rank order by Classroom 3, Classroom 1,

TABLE 4

ADJUSTED STUDENT TYPE SCORES

	E/I		S/N	
	Mean	SD	Mean	SD
C-1	-3.0625	7.0092	-1.2500	6.4859
C-2	-1.0000	6.4169	-1.7778	7.9005
C-3	-5.0556	5.7545	-3.3889	7.2448
C-4	-5.2381	5.4581	-1.1429	7.5052
C-5	-2.2000	5.2942	- .3333	7.8072
All	-3.4205	6.0983	-1.6136	7.3131

	T/F		J/P	
	Mean	SD	Mean	SD
C-1	6.4375	6.1315	7.1875	9.2824
C-2	6.3889	7.8301	7.1667	12.3824
C-3	8.1111	6.7466	4.0000	9.1266
C-4	9.6190	5.3148	.3810	8.3694
C-5	8.5333	6.3117	6.8667	6.6210
All	7.8864	6.4744	4.8523	9.5935

Classroom 5, and Classroom 2. None of the aggregated scores indicate a preference for introversion because there are no positive scores indicated in the data in the E/I polarity. The standard deviation of these scores indicates a modest amount of spread of scores in Classroom 5 (SD 5.2942) and Classroom 1 (SD 7.0092).

The sensing/iNtuitive polarity exhibits data which indicates all aggregated classroom scores expressed a preference for the sensing dimension of the polarity. (A negative number in the mean score of the data indicates a preference for the first letter of the dichotomy. When all mean scores are negative in the S/N dimension, the preference for sensing is indicated.) In rank order the classroom with the greatest preference for sensing is Classroom 3, followed by Classroom 2, Classroom 1, Classroom 4, and Classroom 5. The standard deviation of these scores indicates a minimal amount of spread of scores in Classroom 1 (SD 6.4859) and Classroom 2 (SD 7.9005).

In the thinking/feeling polarity, the aggregated classroom scores are all positive, indicating a preference for the second dimension, or the feeling dimension. The larger the positive number, the stronger the preference for the feeling dimension. In rank order, beginning with the strongest feeling score, aggregated classroom preferences are as follows: Classroom 4, Classroom 5, Classroom 3, Classroom 1, and Classroom 2. The standard deviation of these scores indicates a minimal amount of spread of scores,

in Classroom 4 (SD 5.3148) and Classroom 2 (SD 7.8301).

In the judging/perceiving polarity, the aggregated classroom scores are all positive, exhibiting a preference for the second dimension, or the perceiving dimension. The larger the positive number, the greater the preference for the perceiving dimension. In rank order, beginning with the strongest perceiving score, aggregated classroom preferences are as follows: Classroom 1, Classroom 2, Classroom 5, Classroom 3, and Classroom 4. The standard deviation of these scores indicates a reasonably large amount of spread of scores, in Classroom 5 (SD 6.6210) and Classroom 2 (SD 12.3824).

By noting the positive and negative signs of the aggregated mean scores for the entire population, the type profile of the classrooms is ESFP. As indicated in the aggregated mean scores and in the standard deviation scores, the strength of the preferences varies by classroom.

Teacher Personality Type

Table 5 profiles the five teachers according to scores derived from the MBTI based on extraversion/introversion (E/I), sensing/iNtuitive (S/N), thinking/feeling (T/F), and judging/perceiving (J/P).

TABLE 5

DERIVED TEACHER SCORES OF MBTI

	E/I	S/N	T/F	J/P		Type
Teacher 1	-18	-5	4	-8	=	ESFJ
Teacher 2	3	-27	-2	-16	=	ISTJ
Teacher 3	-18	-17	9	4	=	ESFP
Teacher 4	-19	-26	9	-4	=	ESFJ
Teacher 5	8	-14	-2	3	=	ISTP

In all instances, the larger the negative number, the stronger the teacher's preference towards the first polarity listed in the Table 5 columns and conversely, the larger the positive number, the stronger the teacher's preference towards the second polarity listed in the column. For example, in the first column, the score of Teacher 4 indicates the strongest preference towards extraversion of the subject teachers, while the score of Teacher 5 indicates the strongest preference towards introversion of the subject teacher.

In the second column (S/N) of data, all teachers indicate a preference for the sensing polarity. The degree to which the teachers prefer the sensing dimension is markedly different. Teacher 2 indicates the strongest

preference (-27) for the sensing polarity while Teacher 1 indicates the weakest preference (-5) for the sensing polarity.

In the third column (T/F) of data, Teacher 2 and Teacher 5 (as evidenced by the negative number) show a similar preference for the first dimension in the polarity, the thinking dimension. Teacher 3 and Teacher 4 exhibit a strong preference for the feeling polarity (as evidenced by the positive number). Teacher 1 also indicates a preference, though milder than Teacher 3 and Teacher 4, for the feeling dimension.

In the fourth column (J/P) of data, Teacher 2 shows the strongest preference for the judging dimension, followed respectively by Teacher 1 and Teacher 4. Teacher 3 indicates the strongest preference of all the subject teachers for the perceiving dimension, followed closely by the shared preference of Teacher 5.

By combining the preference of each of the polarities for each teacher, the personality type is identified. Table 5, column 5, indicates the personality profile of each teacher in the study.

Table 6 profiles the teacher's discrepancy scores by level of aggregated classrooms on each of the four personality dimensions.

These scores indicate absolute values for the discrepancy of the teacher and student scores. They determine the degree to which the personalities of the

TABLE 6

DISCREPANCY SCORES BY LEVELS
OF AGGREGATED CLASSROOMS

	E/I		S/N	
	Mean	SD	Mean	SD
C-1	14.9375	7.0092	6.2500	3.9243
C-2	6.4444	3.7608	25.2222	7.9005
C-3	12.9444	5.7545	13.6111	7.2448
C-4	13.7619	5.4581	24.8571	7.5052
C-5	10.2000	5.2942	13.6667	7.8072

	T/F		J/P	
	Mean	SD	Mean	SD
C-1	5.1875	3.9025	15.1875	9.2824
C-2	10.1667	5.1364	23.2778	12.1597
C-3	5.6667	3.5147	7.1111	5.4545
C-4	4.4286	2.8385	7.4286	5.6795
C-5	10.5333	6.3117	6.1333	4.4218

students and the teacher were alike on each dimension. These calculations were obtained by taking the adjusted student score on each dimension from the teacher score on

each dimension, thereby yielding an absolute value on each of the 4 dimensions for the discrepancy of the teacher personality and student personality.

For example, these calculations would indicate that in the extraversion/introversion dimension, the students in Classroom 2 the most nearly share a similar preference with their teacher because their mean score was the smallest of all the classrooms. The standard deviation in Classroom 2 also reflects the relative stability of student scores, compared to the other classrooms, because of the smallest standard deviation.

For instance the students in Classroom 2 and Classroom 5 share a somewhat similar distribution of scores in the sensing/iNtuitive dimension, however, the students in Classroom 2 are more unlike their teacher than the students in Classroom 5 because they have the smaller mean discrepancy score of the two classrooms.

In the thinking/feeling polarity, the students in Classroom 4, in comparison with the other subject classrooms, are most like their teacher, as indicated by the smallest mean score. The aggregate student scores in Classroom 4 also reflect the greatest amount of stability of all the subject classes as indicated by the smallest standard deviation in the thinking/feeling dimension.

In the judging/perceiving dimension, the aggregated student scores reflecting the greatest differences with the teacher are found in Classroom 2 as shown by the largest

mean score. Classroom 2 also exhibits the greatest spread of differences in all the subject classrooms.

Summary

This chapter has profiled the procedures of the study, giving a description of the instruments, computational procedures, and presentation of the data.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF THE DATA

Chapter IV presents the correlation coefficient matrix (in terms of the achievement gain scores of the ITBS and the personality type discrepancy scores of students and their teachers as measured by the MMTIC and the MBTI), establishes the strength of the relationship and summarizes the results.

Analysis

To examine the potential intraclassroom differences (that is differences between an individual student and teacher), two questions were asked:

1. What is the relationship of students and teacher type discrepancy on vocabulary, reading, language skills, social studies, science, and composite skills?

2. What is the strength of the relationship of students and teacher type on those same scales?

Correlation Coefficient Matrix

To examine intraclassroom relationships, individual student achievement gains were correlated with the discrepancy scores of the individual student's and teacher's

personality using a Pearson product moment correlation in order to determine any statistically significant relationships.

Table 7 puts into perspective the findings by listing the correlation coefficients between each achievement category of the ITBS (vocabulary [V], reading [R], language total [LT], work study [WS], mathematics total [MT], social studies [SS], and complete composite [CC]), and the discrepancy (DISC) in the personality categories extraversion/introversion (E/I), sensing/iNtuition (S/N), thinking/feeling (T/F), and judging/perceiving (J/P). The coefficient was used to establish whether each achievement category had a strong positive or negative relationship with the personality categories. The correlation coefficients were obtained by using a 2-tailed analysis as is necessary in an exploratory study (Norusis, 1983).

Summary of Results

The establishment of a relationship between Jungian personality types of individual students and their teachers and student achievement in the classroom was partially supported. Numerical values of correlation coefficients ranging from .2000 to .4000 are considered moderately weak (Weinberg & Goldberg, 1990). A significant, but moderately weak, relationship ($p<.05$) was found between thinking/ feeling and a positive gain in language skills. The findings suggest the more unlike students and their teachers in the

personality category of thinking and feeling, the greater the gains in the area of the mechanics of writing (subtests of

TABLE 7

CORRELATION OF STUDENT ACHIEVEMENT GAINS AND INDIVIDUAL DIFFERENCES IN TEACHER AND STUDENT PERSONALITY

Personality Type	VGAIN	RGAIN	LTGAIN	WSGAIN
DISCEI	-.0136	.0387	-.0723	-.2057
DISCSN	.0140	.1867	.0665	.2188*
DISCTF	.1304	-.0335	.2599*	.1254
DISCJP	.1412	-.0672	.1632	.0310
TOTDISC	.1274	.0754	.1880	.1112

Personality Type	MTGAIN	SSGAIN	SGAIN	CCGAIN
DISCEI	.2101*	.0073	.0654	-.0500
DISCSN	-.0283	.0744	-.1212	.0958
DISCTF	.0495	.1184	.0062	.1963
DISCJP	-.0187	.1812	-.0526	.2007
TOTDISC	.0639	.1923	-.0779	.2166

*=p<.05 (2-tailed)

language; L-1, L-2, L-3, L-4). For the purpose of this study, unlike has been defined in terms of the discrepancy score of the personality measures of student and teacher. (Computation of the discrepancy score was described in detail in Chapter 3.) The greater the numerical difference between the score of the teacher and the score of the student, after the scores were made congruent with one another, the more unlike the personality of the student and the teacher.

A significant, but moderately weak, relationship ($p<.05$) was found between sensing and iNtuitive and a positive gain in visual and reference materials (subtests of work study skills; W-1 and W-2). The findings suggest the more unlike students and their teachers in the personality category of sensing/ iNtuitive, the greater the gains in the area of work study skills.

A significant, but moderately weak, relationship ($p<.05$) was also found between extraversion/introversion and a positive gain in mathematics skills. The findings suggest the more unlike students and their teachers in the personality category of extraversion/introversion, the greater the gains in the area of mathematics skills.

The correlation matrix (see Table 7) reflects the fact that all significant findings ($p<.05$) were positive. There were no negative significant findings in the study. Aggregated student achievement and individual student achievement are not adversely affected because of

discrepancies in personality type of a student and the classroom teacher.

Even though significance ($p<.05$) was established in the relationship of thinking/feeling and language skills, sensing/iNtuitive and work study skills, and extraversion/ introversion and mathematics skills, the fact remains there was no relationship, either positive or negative, in the remaining areas (vocabulary, reading, social studies, and science) of student achievement and personality discrepancy scores of students and teachers. The fact there is no significant relationship in the remaining areas could be interpreted to mean the more alike or unlike student/teacher personalities are has no significant positive or negative impact on student achievement in the classroom.

CHAPTER V

CONCLUSIONS AND SUMMARY

This chapter contains a summary of the study, a summary of the findings, interpretation of the findings, commentary and recommendations for practice, research, and theory.

Summary of the Study

This was a correlational study designed using Jungian psychological type theory. Personality type of fourth grade students and their teachers were determined and correlated with student achievement gain scores. The data collected during the course of the study was analyzed to provide a basis for comparison between personality types and achievement gains in the classroom. The application of Jungian psychological type theory in the classroom can allow educators to be aware of possibilities to employ alternative teaching strategies based on the individual preferences of students and teachers thereby resulting in greater achievement gains in the classroom.

Summary of the Findings

Differences in student achievement occurred in the subpopulations in randomly assigned classrooms.

Discrepancies of student personalities and teacher personalities also existed in these same randomly assigned classrooms. To examine the relationship of student achievement and discrepancies of student and teacher personalities, correlation coefficients were established from achievement categories (vocabulary, reading, language skills, work study skills, mathematics skills, social studies, science, and composite skills of the ITBS) and personality categories of students and teachers, using the MMTIC and MBTI respectively.

The establishment of a relationship between Jungian personality types of individual students and their teachers and student achievement in the classroom was partially supported. Significant relationships ($p<.05$, 2-tailed) between the thinking/feeling (T/F) dimension and a positive gain in the language skills, as well as between sensing/ iNtuitive (S/N) and a positive gain in work study skills. A significant relationship ($p<.05$, 2-tailed) was also found between extraversion/introversion (E/I) and a positive gain in mathematics skills.

Interpretation of the Findings

One of the most important findings of this study is the fact that there is no significance in the relationship of all areas of student/teacher personality types and student achievement. These findings can be interpreted to mean that the interaction of students and teachers in the classroom

results in gains in student achievement. A teacher does not adversely affect a student's achievement in the classroom and in some cases may enhance a student's achievement.

The findings can be interpreted that teachers impact student achievement in a positive manner. It is important to note that although not all areas of student achievement showed significant gains when correlated with personality measures, student achievement measures were never found to be adversely affected by personality measures. In other words, the findings could be interpreted to support the conclusions that student/teacher personality measures and, in some instances, student achievement can be significantly enhanced by unlike students and teachers.

Significance ($p<.05$, 2-tailed) in the area of language skills was reflected in the findings. Of particular note is the congruence of the thinking/feeling personality measure and the goal of the language skills area of the ITBS. Stated in the ITBS manual, ". . . writing is a complex cognitive process" with the goal being, ". . . a written product that expresses the thoughts or feelings as exactly as possible" (Hieronymus & Hoover, 1986, p. 80). It is possible thinking teachers may temper their teaching methods with the logic and structure feeling students need to avoid ambiguity in their writing styles, while feeling teachers may augment their teaching methods with techniques emphasizing self-expression. The achievement test makers (Hieronymus & Hoover, 1986) have acknowledged the goal of

the language skills test to be a measure of both the thinking and feeling dimensions of student achievement.

Another area of significance was found in the area of sensing/intuition and work study skills. All teachers in the study were found to be sensing types, although to varying degrees. The preferred modes of learning for sensing types (Meisgeier & Murphy, 1985) are worksheets, games, field trips, and manipulatives. Assuming that teachers tend to employ their preferred mode and given the fact the work study skills measure of the ITBS is ". . . a single test on the use of visual materials" (Hieronymus & Hoover, 1986, p. 84), it is possible that the instructional methods which were most likely employed by teachers have more directly met the objective of the test than their intuitive counterparts who might be more likely to use such instructional techniques as role play, lecture, or a fantasy trip (Meisgeier & Murphy, 1985). The visual instructional technique the subject teachers most likely employed were congruent with the test makers objective of multimedia and, in particular, visual learning.

Significance was found in the area of extraversion/ introversion and the mathematics gain in the achievement of students. The achievement test makers (Hieronymus & Hoover, 1986) acknowledge little change in the general objectives of the mathematics skills area over the years; those objectives are the measurement of quantification and problem solving skills. It is possible personality types compliment one

another in this area given the test objectives. For instance the problem solving skills of an extraverted teacher would most likely be shared with students through modeling, demonstration, experimentation, and/or working in groups. The introverted teacher would most likely use instructional methods such as individual thinking prior to group discussion, question and answer, or observation. Given the fact that the quantification objective identified by Hieronymus and Hoover (1986) is a kind of discrete, atomistic concept and that the problem solving objective identified by Hieronymus and Hoover (1986) is more of a wholistically applied concept, it would be logical to assume that extraverted and introverted students and teachers may compliment one another. This compliment is then manifested in the significant relationship of extraversion/introversion and mathematics skills. When the ITBS test objectives align with, or reflect facets of, the Jungian constructs, there appears to be significant relationships in the findings of the study.

The lack of significance in all the areas of student achievement could possibly be explained by the need to correct for attenuation and to decrease error variance in the design of the study. The principle of attenuation refers to the possibility of artificially lowered correlation coefficients because of limited measures of reliability. For example, in this study no significant correlation coefficients were found in the ITBS achievement

subtest areas that contained fewer than 66 items. That could be corrected with increasing the number of items in the achievement instrument in the areas of vocabulary, reading, social studies, and science. With these additions, the composite score would likely be found to have significance on two or three of the personality dimensions.

Doubling of error occurred because percentage of correct was used in the scoring procedure of the ITBS. (Normal curve equivalent [NCE] scores were not considered appropriate for this study because those norms were derived from different groups of students at different times [Hieronymus & Hoover, 1986]). NCE scores are derived scores based on different norm groups. Difficulty also occurred in establishing a congruency in scoring the personality measures. Given these realities it was doubtful significance could be found; however, significance was found (see Table 7). If the doubling error of the achievement measure could be reduced and more comparable scoring procedures could be employed in the personality measures, more, and greater, significance could perhaps be found.

Implications and Recommendations

Practice

This study was designed to identify relationships of student achievement and personality measures already existing in classrooms. The implications of this study suggest the possibility of including measures of a student's

personality type along side already existing achievement measures in cumulative folders. Achievement gains could then be tracked in order to determine if teachers consciously cater to the preferences of students that gains in achievement will result. When students are assigned to a teacher's classroom, teachers could then assess the instructional delivery methods most appropriate to meet the needs of all student personality types in the classroom.

The relative technological ease with which personality measures can be quantified and accessed implicitly demands ethical considerations. The possibilities of expanding technologies and linking such quantifications as the personality measures of individuals to large data bases, perhaps calls for a policy review on the part of professionals in the field.

Coinciding with the student personality measures should be a rigorous staff development program designed to help teachers identify their personality preferences. This should be followed by a series of workshops, and short courses detailing ways to adapt curricular materials to each type of student and teacher personality preference. This would be followed up by visits from the district's curriculum and instruction supervisor/specialist in order to collaborate with the teacher on the progress of effective instructional strategies to employ in the classroom. This follow-up should be utilized as a supervisory, rather than evaluative, technique with the goal being to improve

instruction in the classroom. With intensive and deliberate alteration of instructional delivery methods and teaching strategies, the possibility may exist to significantly impact student achievement in the classroom.

Ethical hiring practices must continue. Under no circumstance should the findings of this study suggest the recruitment of certain teacher types to positively impact student achievement.

The findings of this study also point to the possibility to augment teacher preparation programs with the inclusion of the use of personality type theory and the development of teaching strategies, especially in methods courses and educational psychology coursework.

Research

Recommendations for further research include the need to study the relationship of student achievement and the personalities of students the teachers longitudinally. Additionally larger samples need to be studied to answer such questions as, do veteran teachers make instructional adaptations intuitively for their students and is there a relationship between classroom climate and personality? As educators seek to examine the relationship of personality and student achievement from a more subjective paradigm, the possibility exists to add a qualitative component to this study to further explore the techniques teachers are using in the classroom.

The MBTI and the MMTIC are instruments based on the same Jungian theoretical constructs. There is a need, in order to make comparisons, to develop a method to establish scoring congruency between the two instruments.

Theory

The statistically significant findings of this study point out the possibility that certain Jungian personality types "need" each other to maximize. In the instance of this study, student achievement showed significant gains when discrepant personality types of a student and teacher were paired. Examination of the relationship of type in order to maximize potential may be another aspect which deserves further study in psychological type theory.

Summary

Our American educational system is founded on the triangulation of efficiency, equality, and liberty which permeates the social institutions of society (Guthrie et al., 1988). To apply homogeneous treatments to heterogeneous groups distorts this triangulation that has so long been a part of our heritage. Educators must not lose sight of this triangulation, and must hone their skills, being cognizant of the receptivity of students in light of their individual preferences, in order to enhance learning and ultimately achievement.

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APPENDIXES

APPENDIX A

APPROVAL BY OKLAHOMA STATE UNIVERSITY COMMITTEE ON HUMAN SUBJECTS

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
FOR HUMAN SUBJECTS RESEARCH

Proposal Title: THE CORRELATION OF STUDENT ACHIEVEMENT AND TYPE PREFERENCE/DIFFERENCES OF STUDENTS AND TEACHERS

Principal Investigator: Adrienne Hyle/ Deborah Taylor

Date: 4-16-92 IRB # ED-92-044

This application has been reviewed by the IRB and

Processed as: Exempt [xx] Expedite [ ] Full Board Review [ ]

Renewal or Continuation [ ]

Approval Status Recommended by Reviewer(s):

Approved [xx] Deferred for Revision [ ]

Approved with Provision [ ] Disapproved [ ]

Approval status subject to review by full Institutional Review Board at next meeting, 2nd and 4th Thursday of each month.

Comments, Modifications/Conditions for Approval or Reason for Deferral or Disapproval:

Provisions Received

Signature: Marcia L. Tibbey Date: 7-28-92
Chair of Institutional Review Board

APPENDIX B

CONSENT FORMS

Dear Parents of Fourth Grade Elementary Students:

The believes in providing the best education possible for children. There are many factors that go into providing a quality education. One important factor, we feel, is gaining a better understanding of how children achieve in the classroom.

People have preferences (or personality), or ways they like to do things, and so do children and their teachers. It is possible, according to some educators, that when children and teachers can use their individual preferences, improved classroom achievement will result. So, in order to help provide the best education possible for children, we would like to examine the relationship of student and teacher preferences (personality) and classroom achievement.

In order to see if a relationship exists, we will use test scores of the Iowa Test of Basic Skills and the Murphy-Meisgeier Type Indicator for Children. These tests measure student achievement and student personality, respectively.

Oklahoma State University will be sponsoring this research. Deborah Taylor, a doctoral student at Oklahoma State University, will be conducting the research project.

Your child is invited to take part in this district approved study in order for us to better understand student achievement in the classroom. Your child's participation will include the administration of the Murphy-Meisgeier Type Indicator for Children. (The district gives the Iowa Test of Basic Skills to students.) The Murphy-Meisgeier Type Indicator for Children test will be given during the first two weeks of May during the regularly scheduled music class time so your child will not lose any instructional time with his/her homeroom teacher. By participating in the study, please note the following:

1) The information gained on student personality, in this research will not become a part of your child's permanent record.
2) Unlike achievement tests, the Murphy-Meisgeier Type Indicator for Children has no 'right' or 'wrong' answers. It merely measures a child's preference.
3) The information gained from this research will not be identified with individual students or teachers.

One of the greatest benefits of this study is the possibility of improving instruction for all our students. The results of the study may be used in our staff development program to help teachers gain a better understanding of how children achieve. This study will provide information and further our committment to providing the best education possible for children.

If you choose to not have your child participate in this study, please inform your child and send a written note to school before the testing which will take place during the first two weeks of May. If you have any questions concerning this study, please contact Deborah Taylor

If you are interested, you may obtain the results for your child at a meeting on_____or you can schedule a conference with Deborah Taylor sometime during the last week of school at

We look forward to exploring opportunities for improving instruction in the

Dear Fourth Grade Teachers:

The believes in providing the best education possible for children. There are many factors that go into providing a quality education. One important factor, we feel, is gaining a better understanding of how children achieve in the classroom.

People have preferences (or personality), or ways they like to do things, and so do children and their teachers. It is possible, according to some educators, that when children and teachers can use their individual preferences, improved classroom achievement will result. So, in order to help provide the best education possible for children, we would like to examine the relationship of student and teacher preferences (personality) and classroom achievement.

In order to see if a relationship exists, we will use test scores of the Iowa Test of Basic Skills and the Murphy-Meisgeier Type Indicator for Children. These tests measure student achievement and student personality, respectively. Adult personality types will be measured by the Myers-Briggs Type Indicator.

Oklahoma State University will be sponsoring this research. Deborah Taylor, a doctoral student at Oklahoma State University, will be conducting the research project.

You are invited to take part in this district approved study in order for us to better understand student achievement in the classroom. Your partitipation will include the administration of the Myers-Briggs Type Indicator. You may complete the Myers-Briggs Type Indicator during the first two weeks of May. By participating in the study, please note the following items:

1) The information gained from the Myers-Briggs Type Indicator in this research will not become a part of any of your professional records.
2) Unlike some tests, the Myers-Briggs Type Indicatorhas no 'right' or 'wrong' answers. It merely measures an adult's preferences.
3) You will have complete anonymity in your participation of this study.

If you choose to participate in this study, please sign the attached consent form. Information gained in this study will not be identified with specific individuals. Therefore, you will not receive your individual results. However, if you should choose to be informed of your specific results, or you have further questions, please notify Deborah Taylor at
in writing and arrangements will be made for a licensed user to explain your results.

We look forward to exploring opportunities for improving instruction in the

I am consenting to the administration of the Myers-Briggs Type Indicator.
I understand the information gained from the Myers-Briggs Type Indicator

in this research will not become a part of any of my professional records.

I understand I am guaranteed complete anonymity by participating in this study.

Information gained in this study will not be identified with specific individuals.

Thereore, I will not receive individual results.

_____ _____

(teacher's name and signature) (date)

_____

(witness)

VITA

Deborah Beth Taylor

Candidate for the Degree of

Doctor of Education

Dissertation: THE CORRELATION OF STUDENT ACHIEVEMENT AND TYPE PREFERENCES\DIFFERENCES OF STUDENTS AND TEACHERS

Major Field: Educational Administration

Biographical:

Personal Data: Born in St. Joseph, Missouri, July 24, 1954, daughter of Lowell Dean and Willa Ann (Reeves) Ytell.

Education: Graduated from Osborn Public School, Osborn, Missouri, in May, 1972; received Bachelor of Science Degree in Education from Northwest Missouri State University in May, 1975; received Master of Education degree from the University of Southern Mississippi in August, 1981; completed requirements for the Doctor of Education degree at Oklahoma State University in July, 1993.

Professional Experience: Junior High Music Teacher, Turkey Valley Community Schools, Jackson Junction, Iowa, August, 1975 to June, 1977; Chair of Music Department, United States Department of Defense Schools, Jufair, Bahrain, September, 1977 to June, 1978; Band Director, Osborn Public School, Osborn, Missouri, August, 1979 to May, 1980; Band Director, Breckenridge Public School, Breckenridge, Missouri, August, 1980 to May, 1982; Music Educator, Depew Public School, Depew, Oklahoma, August, 1983 to May, 1989; Music Educator, Coweta Public Schools, Coweta, Oklahoma, August, 1989 to present.