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Personality Type and Question Preference of College Level Students

Sheryl L. McGlamery
University of North Florida

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Personality and Questioning

Personality Type and Question Preference of College
Level Students


By


Sheryl L. McGlamery


A thesis submitted to the Division of
Curriculum and Instruction, in partial fulfillment
of the requirements for the degree of
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Dr. Marianne Betkouski Barnes, Advisor


Dr. Robert Drummond, Committee


Dr. Sharian Deering-Levin, Committee

ORIGINAL

Personality and Questioning

Abstract

The impact of personality type on question preference is an area of new endeavor. It is the purpose of this study to determine if a relationship exists between the Sensing and Intuiting dimensions of personality as measured by the Myers-Briggs Type Indicator (MBTI) and the questioning preference of students. A Chi Square analysis of the data revealed a trend. Frequency distributions were used to determine the direction of the trend. Both the Sensing and the Intuiting subjects showed a tendency to follow type with regard to question preference. In other words those subjects showing a Sensing preference on the MBTI tended to chose questions that matched their type preference. The same trend was observed for the Intuitive subjects as well. The data seem to indicate that there is a relationship between personality type and question preference, but more research is needed to describe and define the relationship.

Personality and Questioning

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Personality Type and Question Preference of College
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Chapter 1

Introduction

One of the major concerns in education today is how to communicate information to students in the most efficient manner possible. Most educators are well aware that many variables are involved in the teaching and learning process, some beyond the control of the instructor. Some of these variables have been studied in depth, while others have received little attention. The study of personality type and its impact on question preference is a new endeavor in education. While both personality type and questioning have been well researched in their own right, little is known about the interaction of these two areas with regard to the teaching and learning process.

The importance of understanding the role of personality in the learning process is underscored by the research correlating the Myers-Briggs Type Indicator (MBTI) with learning style variations. The MBTI was chosen as the personality assessment instrument for use in this study for the following reasons: (1) validity of research using the MBTI, (2) reliability of the MBTI as a

predictor of behavior, (3) widespread use by educators, (4) ease of administration, and (5) relevancy to educators.

Research associated with the MBTI in general indicates that students who score as having a Sensing preference need structure and prefer to study the application of theories rather than the theories themselves. Sensing students also seem to prefer direct sensory experiences rather than emphasis on abstract ideas. The data show that Sensing students have a need to experience concepts with their senses in order to fully understand the ideas presented (Briggs-Myers, 1980).

In contrast, students who score as having an Intuitive preference as measured by the MBTI prefer less structure and seem to enjoy studying abstract concepts and theoretical constructs. The Intuitive students do not seem to depend heavily on concrete examples in order to understand the concept. Also the Intuitive students are not strongly dependent on their senses for understanding (Briggs-Myers, 1980).

This information seems to point educators toward a related consideration. If personality does impact learning, then to what extent does it influence the way in which teachers structure learning tasks in order to help their students learn? The observations and research

of many educators seem to indicate that students may prefer to approach learning from an individual perspective or style. Studies on the topic of learning styles suggest that learning style might be related to or affected by personality type (Lawrence, 1985).

A review of related literature indicates that persons identified as Sensing on the MBTI tend toward a linear learning style while persons identified as Intuiting on the MBTI tend to prefer a more global approach (Lawrence, 1985). Therefore, if certain personality dimensions influence learning style, personality type may also influence the preferences students have for specific kinds of questions they face in the learning environment. Questions are the primary form of verbal interaction between students and teachers in classrooms. Questions and questioning techniques are still a major focus of educational research because they are a tool in stimulating process skill development, problem solving skill development, and social skill development.

Previous research on teacher questions indicates that instructors who possess greater degrees of the Sensing dimension tend to ask more knowledge and comprehension level questions whereas instructors who possess greater degrees of the Intuitive dimension tend to ask more

analysis and synthesis questions (Lawrence, 1974). These findings lead to a further suggestion that teachers tend to readily follow their own personality types when asking questions of their students. In a similar manner students may also be motivated to respond by individual personality type toward the questions they prefer to have asked of them. Little data are available with regard to this issue.

This project is designed to determine if any relationship exists between particular aspects of personality type as measured by the MBTI and the question preference of students as measured by a researcher-made instrument. If a relationship exists, this study will attempt to define and describe the nature of the relationship.

Chapter 2

Introduction

The review of related literature will be restricted to questioning as employed in the teaching and learning process and personality type as it relates to the educational applications of the MBTI. The studies cited in this review are a representative sample of the type and scope of the studies conducted in the fields of questioning and personality type as measured by the MBTI. The purpose of this review is present an overview of the aspects considered relevant to the problem of question preference and personality type.

Questions and Questioning

The research on the topic of questioning has focused primarily on the categories of teacher questions and questioning strategies. The goal of the research is to determine what type of question or questioning strategies seems to augment student achievement. The research in the area of questioning goes back to the turn of the century when it was found that recitation was the substance of classroom interaction (Hoetker & Ahlbrand 1969). Studies today still confirm that recitation is widely used as a teaching method (Dillon, 1982; Durkin, 1978; Sirotnik, 1983).

The first group of studies is concerned with the effects of higher level cognitive questions on student achievement as measured by standardized achievement tests. Initial studies reviewed by Dunkin and Biddle (1974) were inconclusive, and the findings reviewed by Rosenshine (1971) were mixed showing no clear trends. Winne (1979) reviewed a number of studies individually and concluded that the cognitive level of the questions asked by teachers had no effect on student achievement. The same set of studies reviewed by Winne were subsequently reviewed by Redfield and Rousseau (1981) using meta-analysis. Redfield and Rousseau concluded the higher cognitive level questions did have a positive effect on student achievement. Additional support for the positive effects of higher cognitive questions can be found in the studies by Lamb (1976), Andre (1979), Hare and Pulliam (1980), and Samson, Strykowski, Walberg, and Weinstein (1987).

The exact mechanism by which questions affect learning is another area under consideration. The research reviewed above does not offer an explanation as to how question level affects student learning. Studies by Gall (1983) give some insight into this process. It appears to be a five step process beginning with the student attending to the question asked. Research by

Rosenshine (1976) found that teachers who used instructional behaviors that engage students have greater success with regard to student response rates.

The second step is understanding what the question is asking. Gullo (1983) found that young children often had difficulty comprehending what was asked in the question. Gullo (1983) also noted that teachers who rephrased their questions and tried to clarify meaning had a much greater success in student response rate.

The third step in the question and response cycle is the generation of a covert response. The student must process the question and then access relevant information from memory in order to phrase a response. Research by Dillon (1982), Mills and others (1980), and Wilson (1973) found that an indirect measure of the covert response is the cognitive level of the student response. Their studies show that less than half of all responses given to teacher questions were on the same cognitive level and that at least one quarter of all responses were on a lower cognitive level. This effect seemed to be independent of the level of cognitive question asked by the instructor.

The fourth aspect of the process is the generation of the overt response. Gall (1970) and Ryan (1972) identified several aspects of teacher questions that seem

to influence student responses, such as teacher wait-time. The aspect of teacher wait-time has been confirmed as an important determinant of student response and performance in discussion sessions. However, Rowe (1974) found that most teachers wait an average of one second for a response from students before asking another question. Swift and Gooding (1983) and Tobin and Capie (1982) found that an extended wait-time improved the depth and length of student responses to teacher questions. Also Dillon (1981) found that the length of student responses increased when teachers asked fewer questions.

The fifth step in the process is the revision of the response. One variable that seems to contribute to the question-answer process is the redirection of teacher questions toward other students. Positive gains in student achievement are noted in studies by Riley (1981), and Wright and Nuthall (1970) when the redirection technique is employed. Studies by Gall and others (1978) and Rosenshine (1980) found that recitation improved student achievement regardless of the cognitive level of the questions asked. The findings of Gall and Rosenshine attribute this achievement to the students' needs for practice, feedback, and cueing.

The trend in teacher question research in the past has been to focus on the techniques of questioning and the resultant student achievement gain or loss. The emphasis of the past research was in the cognitive domain, with little emphasis placed on the affective domain and its influences (Gage, 1978).

Personality Type

Jungian personality theory will be the theoretical base of the review on personality and its involvement in question preference. The Myers-Briggs Type Indicator used in this project is based on the concepts of personality theory developed by Carl Jung in the early twentieth century. The personality dimensions that Jung proposed and that the MBTI measures are as follows: extroversion (E) vs. introversion (I), sensing (S) vs. intuition (N), thinking (T) vs. feeling (F), and judging (J) vs. perceiving (P). The Extraversion and Introversion factors affect the attitudes and relationships persons have with the world or the environment. The Sensing and Intuition factors of the personality affect the way a person takes in and processes information. The Thinking and Feeling factor relates to the way a person makes a decision, and the Judging and Perceiving factor of the personality affects a person's preference in regard to lifestyle.

One of the considerations in the area of teacher question research is the effect of teacher personality on questioning preferences and techniques. Several studies have confirmed that the teaching profession tends to attract certain personality types (Hoffman & Betkouski, 1981). The distribution of teacher personality type(s) have been the focus of several studies. Carlyn (1976) found that the most common personality type in teaching was the ESFJ. Further studies of personality type and teachers in K-12 settings reveal that teacher personality affects the kinds of questions the teacher prefers to ask. In a study by Lawrence and DeNovellis (1974) teachers found to be Sensing tended to ask more knowledge and comprehension questions. In contrast, teachers found to be Intuitive tended to ask more synthesis and evaluation questions.

The study of personality types and teaching has been greatly influenced by research using the MBTI. Several studies have explored aspects of personality type as it relates to learning style of students (Lawrence, 1985). Isabel Briggs-Myers (1980) states that Intuitive students tend to prefer a global approach to learning. The Intuitive student enjoys theory, likes to deal with abstract concepts, but generally dislikes remembering facts. In contrast, the Sensing student prefers factual

information presented in a linear fashion. The Sensing student also dislikes theory and prefers to focus on the application aspect of knowledge.

In summary, the focus of the review of literature as it relates to questioning is on the techniques used by teachers when questioning students, and on the five step response process of students to various types of questions. The variables explored included teacher wait-time, cognitive level of questions asked, and student achievement gain or loss.

The aspect of personality theory is also included in the review. Since the MBTI is chosen as the personality type assessment instrument, the review is restricted to Jungian personality theory. The aspects covered in the review include the personality dimensions measured by the MBTI and studies related to teacher personality type and student personality type.

Chapter 3

Procedures

The project was designed to determine if a relationship exists between student personality type and question preference. Based on the above literature review the research project endeavored to investigate the relationship between personality type of the student and the preference for Sensing or Intuiting questions.

The MBTI was chosen as the personality assessment instrument because of its reliability in predicting behavior and because of the kinds of research done using the MBTI. A researcher-made question preference inventory (see Appendix) was used for the measurement of preference for Sensing or Intuitive questions. The use of the researcher-made instrument was necessary to the study because no other assessment instrument could be located that measured the appropriate preference for question type. In order to establish face validity of the researcher-made instrument, a panel of four experts in the fields of research and test development were chosen to review the instrument and suggest revisions. The instrument was revised to reflect the recommendations of the panel. The question preference inventory consisted of a brief reading on a science topic, followed by a set of twelve pairs of questions about the reading.

Each pair of questions contained one Sensing and one Intuiting question altered to provide desirability and cognitive level. Since the project was exploring relationships among concepts new in the field, a pilot study was designed and implemented to determine if any relationship exists between personality type and question preference.

The pilot study was completed at the University of North Florida, a regional state-supported institution, during the summer of 1987. The purpose of the study was to test the null hypothesis that there was no relationship between personality type and question preference among college students. The independent variable of personality type was hypothesized to have no effect on the dependent variable of question preference. The subjects tested were junior level education majors whose ages ranged from 20-27 years old, and who were predominately white, female, and middle-class college students. A total number of seventy-three subjects participated in the pilot study.

The subjects were given the Myers-Briggs Type Indicator to determine personality type preference. Immediately following the administration of the MBTI, the subjects were given the question preference inventory developed by the researcher in order to ascertain if the

subjects preferred questions directed at providing Sensing-type or Intuitive-type information. The students were instructed to choose the question they preferred. All subjects were tested in a group setting with minimal interaction with the test administrator.

The preference for Sensing or Intuition from the MBTI was compared with the number of Sensing questions chosen and the number of Intuitive questions chosen. Chi Square was used to analyze the data. Both the Sensing and Intuitive preference groups were placed in one of three categories based on the number of questions chosen. The three categories were as follows: category 1- follows type- the subjects in this category chose a majority of questions (seven or more) that matched their preference on the MBTI; category 2- borderline- the subjects in this category did not choose a majority of questions in either the Sensing or Intuiting mode, instead they chose six questions from the Sensing group and six questions from the Intuiting group; category 3- did not follow type- the subjects in this category chose a majority (seven or more) that did not match their preference on the MBTI. A significant Chi Square value of 9.90 was obtained at the 0.01 level of significance with two degrees of freedom, resulting in a rejection of the null hypothesis. (See Table I.)

Table I

Pilot Study: Chi Square Analysis of Personality Type and Question Preference

	Category 1 Follows Type	Category 2 Borderline	Category 3 Did Not Follow Type	TOTALS
Observed Frequency	37	18	18	73
Expected Frequency	24.3	24.3	24.3	73

Chi Square = 9.90, df =2, p <.01

Contingency Coefficient = .34

Also a trend was found when comparing the Thinking/Feeling dimensions of the personality with the selection of Sensing-type or Intuitive-type questions. The trend found indicated the following: persons showing a Thinking preference on the MBTI tended to choose more Sensing questions, while the persons showing a Feeling preference on the MBTI tended to choose more Intuitive questions. A

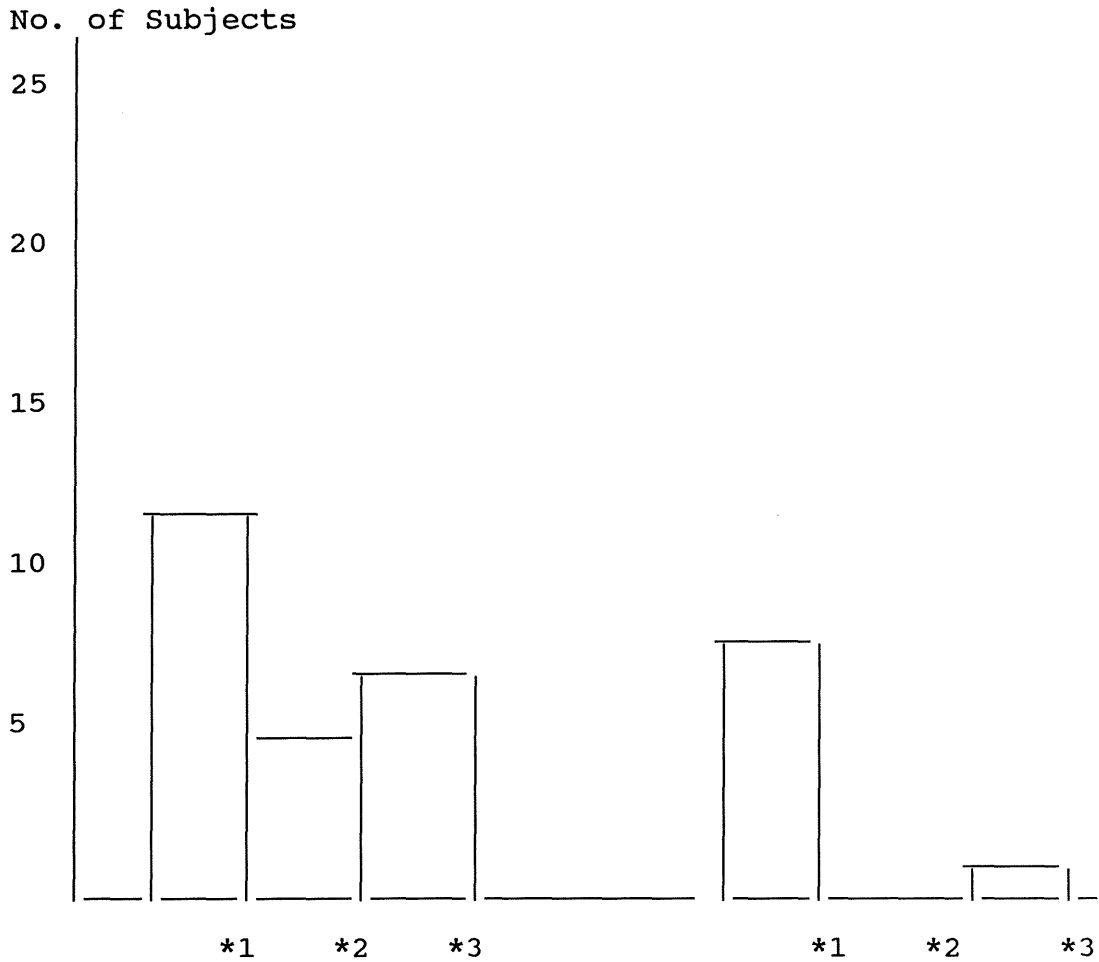
Chi Square value of 12.45 was obtained with 9 degrees of freedom at the 0.1887 level of significance. However, the Chi Square value calculated for this trend was not significant.

In order to better determine trend direction, a frequency distribution of the data was designed. (See Tables II and III.) The purpose of such a distribution was to compare degree of personality preference, low or medium, with the number of Sensing or Intuiting questions chosen. A low personality preference corresponded to a score on the MBTI of 28 or less and a medium preference corresponded to a score of 29 to 40, no high scores were found within this sample. The personality preference score categories described were the same for both the Intuitive and Sensing groups. Also, separate distributions for Sensing and Intuiting persons were compared to ascertain if any differences existed between the two personality aspects with regard to their question preferences.

The results of the frequency distributions were as follows: (1) low Sensing preference subjects tended to follow type or remain borderline, while low Intuiting subjects tended to follow type; (2) medium Sensing subjects show a trend toward type, while medium Intuiting subjects tended to follow type. Although the total

Table II

Pilot Study: Frequency Distribution of Intuitive Type and Question Preference



Low Intuitive Preference Medium Intuitive Preference

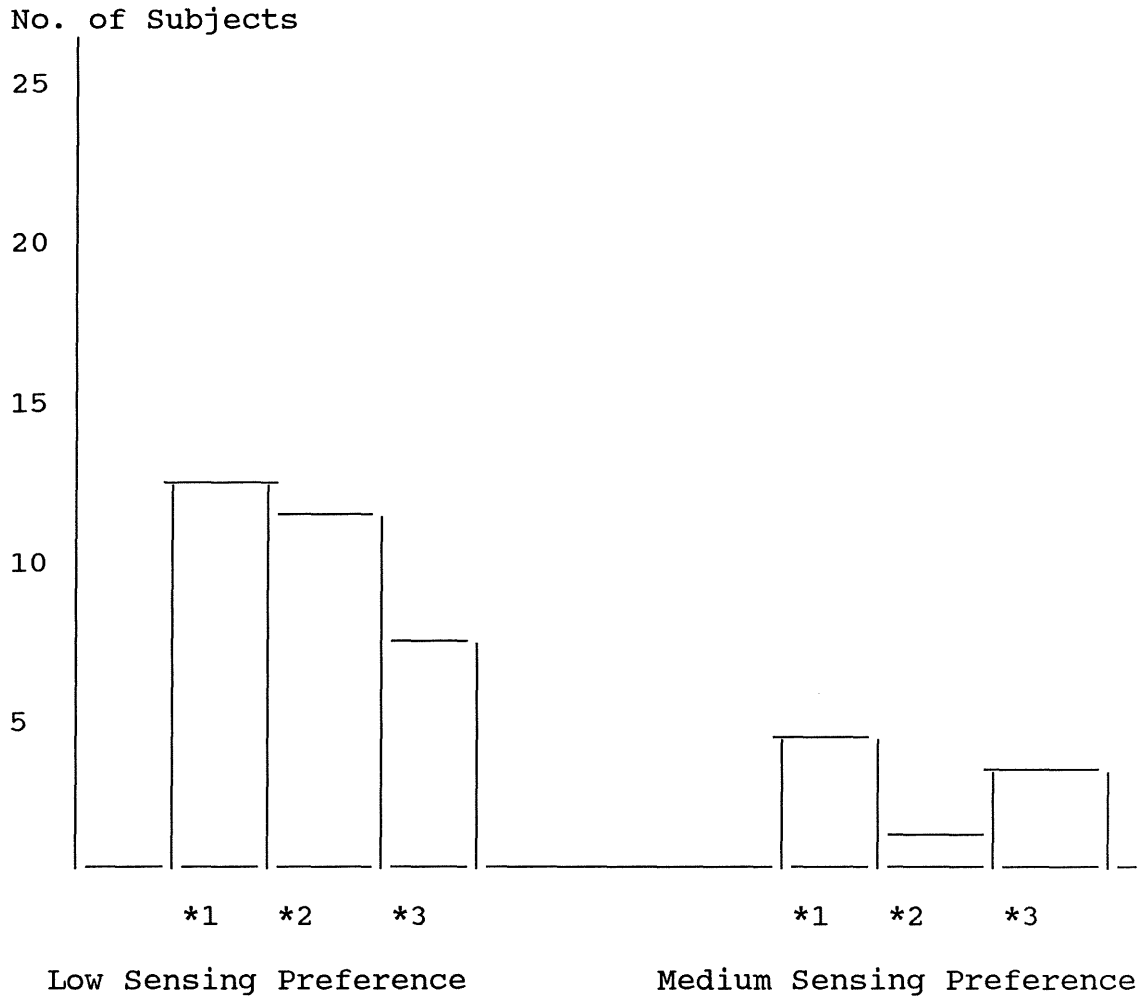
*1- follows type- chose seven or more Intuitive questions.

*2- borderline- chose six Sensing and six Intuiting questions.

*3- did not follow type- chose seven or more Sensing questions.

Table III

Pilot Study: Frequency Distribution of Sensing Type and Question Preference



*1- follows type- chose seven or more Sensing questions.

*2- borderline- chose six Sensing and six Intuiting questions.

*3- did not follow type- chose seven or more Intuiting questions.

number of subjects within the categories were small and there were no extreme scores, the results exhibited enough differentiation to warrant further research.

The pilot study resulted in a decision to test the null hypothesis further with a larger, more heterogeneous sample. A sample size of 100 was deemed necessary to determine the nature of the relationship. The final test subjects were freshman level biology students and graduate education majors whose ages range from 18-36 yrs. A total of one hundred and twenty-four subjects participated in the final study. The students were representative of the population attending the University. The final testing was completed during the Fall semester 1987 and the Spring semester 1988. The subjects were tested in a group setting with minimal interaction with the test administrator. The MBTI was administered first, followed by the researcher-made question preference inventory. Chi Square was used to analyze the data. A significance level of 0.01 was assigned with two degrees of freedom.

Chapter 4

Introduction

The purpose of the final study was to test the null hypothesis that there was no relationship between personality type and question preference among college students. The independent variable of personality type was hypothesized to have no effect on the dependent variable of question preference.

Results

The preference for Sensing or Intuiting from the MBTI was compared with the number of Sensing questions chosen and the number of Intuitive questions chosen. Chi Square was used to analyze the data. (See Table IV.) Both the Sensing and Intuiting preference groups were placed in one of three categories based on the number of questions chosen. The three categories were as follows: category 1- follows type- the subjects in this category chose a majority of questions (seven or more) that matched their preference on the MBTI; category 2- borderline- the subjects in this category did not choose a majority of questions in either the Sensing or Intuiting mode instead, they chose six questions from the Sensing group and six questions from the Intuiting group; category 3- did not follow type- the subjects in this category chose a majority of questions (seven or more)

that did not match their preference on the MBTI. A Chi Square value of 12.67 was obtained with two degrees of freedom at the 0.01 level of significance, resulting in a rejection of the null hypothesis.

Table IV

Chi Square Analysis of Personality Type and Question Preference

	Category 1 Follows Type	Category 2 Borderline	Category 3 Did Not Follow Type	Totals
Observed Frequency	57	26	41	124
Expected Frequency	41.3	41.3	41.3	124

Chi Square = 12.67, df=2, p <0.01

Contingency Coefficient = .31

After obtaining a significant Chi Square at the 0.01 level, the data were grouped according to preference category on the MBTI. A frequency distribution was obtained showing the number of subjects with an Intuitive

preference, the degree of preference, low or medium on the MBTI and the number of Intuitive questions chosen. (See Table V.) A low personality preference score refers to a score of 28 or less and a medium personality score refers to a score of 29 to 40 on the MBTI. No high scores were found in this sample. The same frequency diagram was obtained for the Sensing subjects. (See Table VI.)

The results of the frequency distribution for Intuitives with a low Intuitive score (28 or less) are grouped in the following manner: category 1- follows type- 20 subjects, category 2- borderline- 13 subjects, and category 3- did not follow type-18 subjects. The grouping observed for the low Intuitive preference shows concentration in categories 1 and 3.

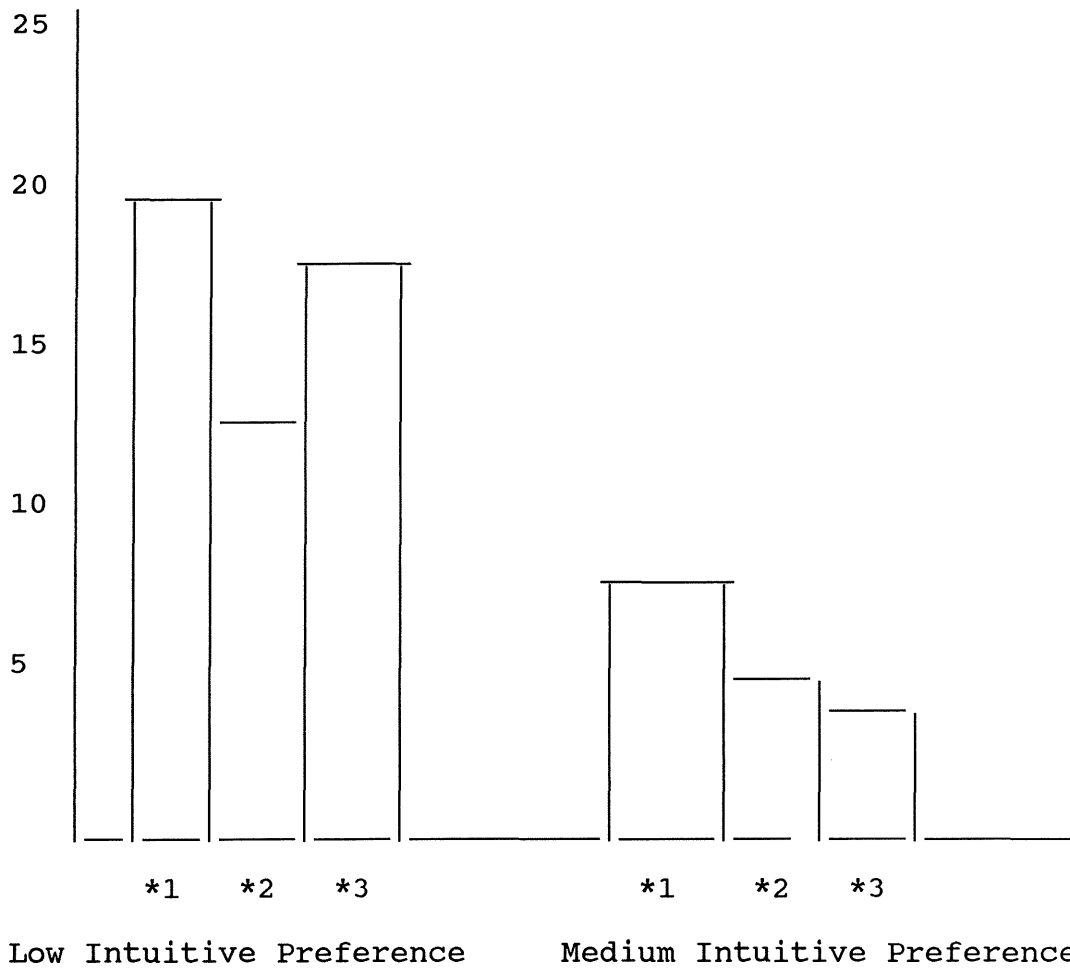
The results of the frequency distribution for medium Intuitive preference (29 to 40) show the following grouping: category 1: 8 subjects, category 2: 5 subjects, and category 3: 4 subjects. Medium Intuitive preference grouping is almost evenly distributed among the three categories.

The results of the frequency distribution for low Sensing preference (28 or less) show the following grouping: category 1: 19 subjects, category 2: 4 subjects, and category 3: 14 subjects. The pattern

Table V

Frequency Distribution of Intuitive Type and Question Preference

No. of Subjects

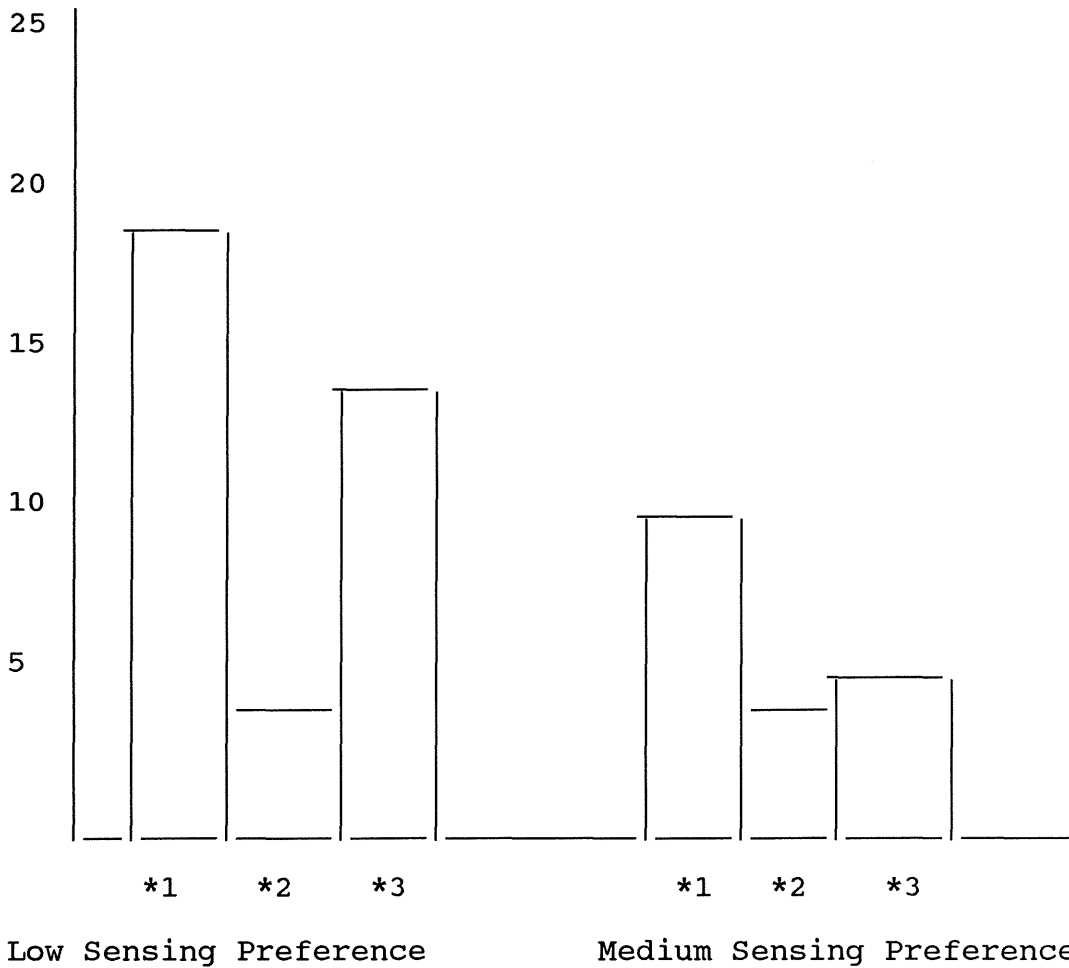


- *1- follows type- chose seven or more Intuiting questions
- *2- borderline- chose six Intuiting and six Sensing questions
- *3- did not follow type- chose seven or more Sensing questions

Table VI

Frequency Distribution of Sensing Type and Question Preference

No. of Subjects



- *1- follows type- chose seven or more Sensing questions
- *2- borderline- chose six Sensing and six Intuiting questions
- *3- did not follow type- chose seven or more Intuiting questions

within the low Sensing group seems to favor categories 1 and 3, with better than 91% of low Sensing preference subjects grouped within these two categories. With only 9% of the low Sensing preference subjects grouped in category 2, the trend seems to be toward the extremes with almost equal numbers of subjects choosing categories 1 and 3.

The medium Sensing preference group (29 to 40) again show better than 50% of the medium Sensing preference subjects grouped in category 1. The results of the grouping are as follows: category 1: 10 subjects, category 2: 4 subjects, and category 3: 5 subjects. The overall results show trends toward the following categories: (1) low preference Sensing and Intuitives tend to group in categories 1 and 3, showing a dichotomy of question preference when the personality preference is low, (2) among the medium preference Sensing group there seemed to be a trend toward category 1, and (3) medium preference Intuitives show a weak trend toward category 1.

Chapter 5

Conclusions

After extensive data analysis with Chi Square and frequency distributions it was determined that there exists a relationship between personality type as measured by the MBTI and question preference as defined by a researcher-made question preference inventory. A relationship appears to exist between the Sensing and Intuiting aspects of personality type and question preference in regard to how a question is phrased and the type of information the question is trying to elicit.

Sensing subjects tended to follow type regardless of the degree of personality preference, while Intuitive subjects show a weaker trend toward type with medium Intuiting preference subjects showing the strongest trend toward type. The contingency coefficient was employed to determine the strength of the relationship which proved to be moderate at best. The direction of the trend was found by employing a frequency distribution showing a trend toward type.

The prime weakness in this study exists in the nature of the sample. A larger, more heterogeneous sample was needed to confirm the trend, as there were no high personality preference subjects among the sample. In other words, no subject tested possessed a personality

preference score of more than 38 out of a possible 67 on both the Sensing and Intuiting scales. One possible explanation for the lack of extreme scores was the youthful nature of the population tested. According to Briggs-Myers (1980) personality preference develops as a function of age and experience. Thus, the younger the subject the lower the personality preference tends to be. This factor could have an impact on the strength of question preference as well.

Also, previous educational experiences could have an affect on the preference a person has for certain question types. For example, the research shows that Sensing instructors predominate in the grades K-12 (Hoffmann & Betkouski, 1981). The research also shows that teachers tend to follow type when asking questions of students (Lawrence & DeNovellis, 1974). This learned preference through modeling as a result of more exposure to one form of questioning could impact a student's question preference.

Implications

This study represents a new endeavor in educational research. Therefore, the implications of this study may not be fully realized until more extensive research can be completed. However, a few areas of consideration should be addressed. First, the findings of this study

may prove useful in designing classroom interaction strategies. With the knowledge of student question preference the teacher may be able to communicate information more effectively as well as elicit information from the student in a more efficient manner.

Second, the instructor may also find question preference helpful when designing test items. A better understanding of question preference and its impact on learning may improve a teacher's ability to predict areas of weakness and take the appropriate action to remediate skills or content information.

The third area of possible impact is curriculum design. The goal of most educational processes is information processing. A better understanding of questioning and its influence over learning may open up new avenues for curriculum design. This may allow the curriculum specialist to incorporate the question/personality preferences into materials development.

The fourth area of possible implication is the classroom recitation process. If instructors are aware of the impact of preferences, perhaps an effort will be made to accommodate the different preferences of students in classroom interaction circumstances.

Recommendations

The trend observed in this study should not be generalized to other populations or educational groups until further research is able to replicate the results with different populations. There is a pressing need for further research in the area of personality type and question preference.

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Appendix

Questioning Preference Inventory

Sheryl L. McGlamery

Directions: Read the following summary of a scientific article. For each of the following numbered questions listed, select the question (a or b) you like best.

Enzymes and Fat

Obesity is the number one health problem facing America today. Many health problems that plague the adult population in the U.S. are related to or complicated by overweight. These medical problems include diabetes, cardiovascular disease, hypertension, and hypoglycemia. Most physicians and scientists agree that the control of body fat would improve the lives and prognosis of persons suffering from any of the above conditions. But the big question remains unanswered up to the present is how to control the storage of fat.

Most every person reading this article knows someone who seems to be able to eat any type or amount of food with little threat of weight gain, while other persons have to be conscious of every calorie consumed.

Scientists and doctors have struggled with treatments for the chronically overweight. These treatments seem to work temporarily but in most cases the person returns to

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his or her original weight and may even gain more weight. The pounds on-again-off-again syndrome is only too familiar to most dieters. The dieter struggles to lose weight and may succeed for a time but soon finds that after the diet is over the weight returns very soon. Fad diets promise quick results that often never materialize and may in fact be dangerous to a person's health.

A recent discovery by researchers studying fat metabolism may lead to a more safe and effective method of alleviating obesity. An enzyme has been isolated from insect larvae that seems to block the storage of fat. A similar enzyme has been found to be produced in large amounts in persons who do not gain weight easily. Preliminary research has been conducted where very obese persons (over 50% body fat) were given daily doses of the enzyme synthesized from the insect larvae. Quite significant weight loss was obtained in 61.3% of the cases. Further study will be necessary to determine the full effects of this enzyme but scientists are encouraged about the possible benefits.

Questions: For each of the following numbered questions listed, select the question (a or b) you like best. Indicate your choice by circling the appropriate letter next to your choice.

1. a. What type of insect larvae was used in this experiment?

- b. Why was the type of insect larvae used in this experiment selected?
2.
 - a. What was the reason for the human weight loss?
 - b. How was the enzyme's effectiveness measured in human weight loss, as gross weight or as defined loss of fluid, protein, and / or fat excreted from the body?
3.
 - a. By what method would the enzyme be given to humans; oral, injection, or inhalant?
 - b. What would happen to the rate of weight loss if the method of administration of the enzyme were varied; oral, injection, or by inhalant?
4.
 - a. What adverse side effects, if any, have been discovered in the research on humans?
 - b. What caused the adverse side effects, if any, in the research on humans?
5.
 - a. Would this enzyme conflict with other medications a person might be taking for hypertension, diabetes or other medical conditions because it affects the metabolism of fat?
 - b. What specific research is being conducted to determine if this enzyme will conflict with other medications a person could be taking, like hypertension or diabetes medicines?

6. a. How soon would this enzyme be available to the public and will it require a prescription from a physician to obtain it?
 - b. Would this drug have to be approved by the Federal Drug Administration and the American Medical Society before it became available to the public, and if so, why?
7. a. What is the name of the enzyme and is it like any other human enzyme?
 - b. What is the name and chemical composition of the enzyme?
8. a. What is the theoretical basis for the research on this enzyme?
 - b. How will research on this enzyme correlate with previous research on fat metabolism?
9. a. Does dosage level vary with other variables, like age, and degree of obesity?
 - b. If dosage level interacts with other variables like age, sex, and degree of obesity, is it because fat storage is affected by these variables?
10. a. Could long term usage of this enzyme result in developing a tolerance to it so that it would become ineffective? If so, how would tolerance be prevented?

- b. How will long term usage of this enzyme be evaluated to determine if a tolerance to it is developed?
11. a. How will the enzyme be studied for use with obese children?
- b. Could growth be impaired in obese children who take the enzyme?
12. a. If the enzyme is effective in controlling human fat storage, would other means of weight control become obsolete with resulting deterioration in overall health of individuals taking the enzyme?
- b. How will the use of this enzyme impact the present treatments for obesity?