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PSYCHOLOGICAL TYPE AND PREFERENCES IN THE ACADEMIC ENVIRONMENT

THESIS

Jeannine A. Duncan
GS-12, USAF

Pamela J. Powers
GS-12, USAF

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THESIS

Presented to the Faculty of the School of Logistics and Acquisition Management

of the Air Force Institute of Technology

Air Education and Training Command

In Partial Fulfillment of the

Requirements for the Degree of

Master of Science in Logistics Management

Jeannine A. Duncan

GS-12, USAF

Pamela J Powers

GS-12, USAF

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Jeannine A. Duncan　　　　Pamela J. Powers

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Abstract

This research addresses significant relationships between the components of an individual's psychological type and cognitive style, as measured by the Myers-Briggs Type Indicator (MBTI), and preferences within the academic environment, as indicated on the Educational Style Survey (ESS). The areas within the academic environment which were addressed include classroom configuration, subject matter difficulty, student's study strategy, testing method preferences, amount of student/faculty interaction, and adaptability to academic stress. The sample consisted of 695 Air Force Institute of Technology (AFIT) graduate students in the School of Logistics and Acquisition Management (1985-93) who completed the MBTI and the ESS.

The analysis utilized in this research was the Chi-Squared Goodness of Fit procedures, which determined that some preferences within the academic environment are most or least preferred by the eight MBTI single letter psychological types and the four cognitive types. The eight single letter types are composed of four bipolar types which are Extraversion/Introversion, Sensing/iNtuition, Thinking/Feeling, and Judging/Perceiving, and the four cognitive types are Sensing-Thinking (ST), Sensing-Feeling (SF), Intuitive-Thinking (NT), and Intuitive-Feeling (NF).

Recommendations for additional research are provided.

PSYCHOLOGICAL TYPE AND PREFERENCES IN THE ACADEMIC ENVIRONMENT

I. Introduction

Background

Today's Air Force emphasizes the streamlining of financial expenditures and t: downsizing of the military and civilian workforce. As senior level officers and civilians retire, placement opportunities exist for those individuals who exhibit managerial potential. In order to prepare individuals for these advanced positions, education is required to develop the skills necessary to support the overall acquisition and logistics goals and objectives of the Air Force and the Department of Defense.

One program which offers this type of education is the long-term, full-time graduate degree program offered at the Air Force Institute of Technology (AFIT), Wright-Patterson AFB. The purpose of this program is to provide "education and training to meet Air Force requirements in scientific, technological, managerial, medical, and other fields as directed by HQ USAF" (1994S/D Graduate Programs Handbook; 1). In support of this goal, the graduate degree program currently spends approximately $23,100 per student (excluding student salary) (Koz, 1983). With an average class enrollment of 157 over the last five years, this equates to approximately $3,626,700 being spent for every class that graduates from AFIT. Because this is a considerable investment in time and money, significant emphasis is placed on refining the quality of AFIT's educational program in order to improve the learning environment.

Specific Problem Area

One aspect of the AFIT's educational program which easily lends itself to improvements is the academic environment area such as educational curricula, testing methods, classroom configuration, study strategies, and student/faculty interaction. In order to enhance the learning process, analysis of the academic environment can be accomplished by relating student preferences in this area to psychological types.

For this analysis, the Myers-Briggs Type Indicator (MBTI) was used to determine the psychological type of graduate students. The determination of student type was done just prior to graduation of each year in July or August. This information was then compared to the students' preferences within the academic environment. The preferences within the academic environment were determined through an Educational Style Survey (ESS) that was also administered to the students just prior to graduation. The data was tabulated and the results statistically analyzed to determine preferences. If higher than expected values were shown to exist, then improvements may be recommended that may enhance the learning process by matching student preferences.

Research Question

This research was of an exploratory nature and addressed the following question: What are the relationships between the preferences as measured by the Myers-Briggs Type Indicator (MBTI) and preferences for various aspects of the academic environment as measured by the Educational Style Survey (ESS)?

The null and alternate hypotheses for this question are:

Ho: There is no difference between the preferences as measured by the MBTI, and preferences within the academic environment as measured by the ESS.

Ha: There is a difference between the preferences as measured by the MBTI, and preferences within the academic environment as measured by the ESS.

Investigative Questions

In order to resolve the overall research question, seven investigative questions were developed. Six of those investigative questions are considered essential to answering the research question and are deemed "pivotal" questions. They are questions 2 through 7 and are identified by an "*."

Investigative Question #1: ***Are student psychological types, as measured by the MBTI, similar to the general population?*** This question is important in order to determine if the results from the sample are representative of the overall population (i.e., all people). If the sample psychological types are the same as the general population, then the research results may be generalized to the general population. However, if the sample is not representative of the general population, the application of the results will remain restricted to the AFIT academic environment.

The null and alternate hypotheses for this question are:

Ho: There is no similarity between the psychological types of the sample, and that of the general population, as measured by the MBTI.

Ha: There is a similarity between the psychological types of the sample and that of the general population, as measured by the MBTI.

Investigative Question #2:** ***What are the relationships between one's psychological type and one's preference for classroom configuration? The answer to this question would determine if some classroom configurations are more conducive to enhancing the learning process, assuming certain psychological types are present in the classroom. The determination of the preferred classroom configuration could lead to a configuration option(s) which may be useful in enhancing the learning process. For example, if psychological types on one side of the bipolar scales have no preference for classroom configuration, but those on the opposite end do have a preference, then the classroom configuration could be adjusted to enhance the learning process for the psychological type which indicates a preference. If there are strong preferences across the four bipolar scales, then additional criteria will be considered prior to making a decision on the most appropriate classroom configuration.

The null and alternate hypotheses for this question are:

Ho: There is no relationship between one's psychological type preferences and one's preference for classroom configuration.

Ha: There is a relationship between one's psychological type preferences and one's preference for classroom configuration.

Investigative Question #3**: ***What is the relationship between psychological type and subject matter difficulty as perceived by the student? The answer to this question could indicate the subjects or courses that are most and least difficult based on psychological types. Knowledge of psychological profiles and preferences within the academic environment could be used to aid instructors and staff in creating balanced curricula for each term. This result could be achieved by scheduling required courses so that the most difficult courses are offset by courses identified as least difficult. As a result, student workload should be equalized for any given term.

The null and alternate hypotheses for this question are:

Ho: There is no relationship between psychological type and subject matter difficulty as perceived by the student.

Ha: There is a relationship between psychological type and subject matter difficulty as perceived by the student.

Investigative Question #4**: ***What is the relationship between a student's psychological type and study strategy? The answer to this question could be used in conjunction with the results from the previous investigative question in order to aid instructors in establishing course learning objectives. For those courses identified as most difficult, the instructor may want to establish learning objectives that emphasize the fundamental concepts of the course's material. In contrast, for least difficult courses, emphasis may be shifted to practical application of the material taught in class. In addition, information regarding the size of study groups may also aid instructors in determining an effectual group size for class projects which will encourage maximum participation by all of the group members.

The null and alternate hypotheses for this question are:

Ho: There is no relationship between a student's psychological type and study strategy.

Ha: There is a relationship between a student's psychological type and study strategy.

Investigative Question #5**: ***What are the relationships between psychological type and one's preference for testing methods? The answer to this question may identify some preferences for types of examinations based on psychological type. If this is the case, then the information could be used by instructors in designing examinations with various question formats. Utilizing various question formats within a single examination may aid in reducing unintentional favoritism or discrimination as a result of preferences of psychological types. However, if it is determined that there is no difference between testing method preferences and psychological types, then the results may still be of interest to educators if there is a consensus on the preferred testing methods. Instructors might use this information to reformat their examinations to incorporate the preference(s) of the students. This may aid students by emphasizing the testing of material and decreasing the anxiety associated with the taking of examinations.

The null and alternate hypotheses for this question are:

Ho: There is no relationship between psychological type and one's preference for testing methods.

Ha: There is a relationship between psychological type and one's preference for testing methods.

Investigative Question #6**: ***Is there a relationship between psychological type and the amount of interaction of students and faculty? The answer to this question could aid in explaining the amount of student/faculty interaction that is driven by one's psychological type. This would be the case if, for each psychological type, the number of visits to the staff and faculty is reported at a higher frequency than what is expected. If this occurs, then the possibility exists that the reason for the interaction is the result of one's psychological type. As a result, some negative assumptions (i.e., lack of interaction indicates the student's lack of interest in the topic) may be dispelled. However if this does not occur, then it is possible that there are other circumstances driving student/faculty interaction (i.e., the need for academic counseling, or interest in a given topic). If this were the case, further research would be required in order to support these theories.

The null and alternate hypotheses for this question are:

Ho: There is no relationship between psychological type and the amount of interaction between students and faculty.

Ha: There is a relationship between psychological type and the amount of interaction between students and faculty.

Investigative Question #7**: ***What is the relationship between psychological type and one's ability to adapt to academic stress? For those students who are returning to the routine of a classroom environment after an extended period of time, adjusting to this routine may be difficult. If the adaptability to academic stress is influenced by psychological type, then the responses to this question may provide insight into this relationship. Combining this information with that on adjusting to the academic routine may aid the faculty in balancing course difficulty and workload during the terms when most of the adjustment occurs.

The null and alternate hypotheses for this questions are:

Ho: There is no relationship between psychological type and one's ability to adapt to academic stress.

Ha: There is a relationship between psychological type and one's ability to adapt to academic stress.

Scope of Research

This research is limited to the following criteria:

1. The sample consisted of students who attended the School of Systems and Logistics at the Air Force Institute of Technology during the years 1985-93. They are military and civilian managers who are similar in age, experience, and education.

2. The psychometric instrument used during this research is the Myers-Briggs Type Indicator (MBTI), Form G. The Myers-Briggs testing method is a tool that is used to assist in understanding personality types. As such, it does not explain all aspects and complexities of a personality. While different circumstances may influence the responses an individual selects for the questions, the Myers-Briggs testing method focuses on measuring preferences which have directed choices made by the individual throughout his or her development. Statements regarding psychological type are limited to the preferences indicated on the MBTI, Form G.

3. The Educational Style Survey (ESS) was designed specifically to gather data concerning the student reactions to and within the academic environment. Data collected

does not include any clarifications of questions or student reactions to questions other than the responses provided.

Assumptions

Seven assumptions were made for the purpose of providing operational guidelines for this study. These assumptions, in no particular order of importance, are as follows:

1. It is assumed that the subjects who completed the MBTI would fully understand and respond honestly to the instrument so as to obtain accurate assessments of their personality types. In the event that a respondent provided false or misleading answers, statistical probability will account for the randomness based on the properties of the Central Limit Theorem. In short, the Central Limit Theorem states that "the sample means will be distributed around the population mean approximately in the form of a normal distribution" (Emory & Cooper, 255). Furthermore, if the sample size is large enough, the distribution of the sample mean will be normal even if the population is not normally distributed (Emory & Cooper, 255).

2. The validity of the MBTI as an indicator of psychological types has been established in the social sciences areas. Correlations have been established between the MBTI, the Jungian Type Survey, Gray-Wheelwright, and several self-estimates of type which reasonably indicate that the same basic constructs are being consistently measured (Myers and McCaulley, 1985; 209-211).

3. The Educational Style Survey (ESS) developed by Campbell was used as a collection device for preferences within the academic environment. This survey allows students to identify their preferences based on a multiple choice format so that differentiations could be determined. It is assumed that the use of the multiple choice

response format is more appropriate than a yes/no format when preferences were being addressed (Emory & Cooper, 1991; 368).

4. Computer- and hand-scoring of the response forms was accomplished correctly, with the subsequent input of information into the necessary data bases also accomplished correctly.

5. Given psychological profiles are estimates from a sample size of sufficient number, generalizations based on psychological type may be made to other groups of like psychological type. As the MBTI scores indicate preferences, one can logically assume that within a given psychological type, preferences would be similar. However, it is important to note that extending specific recommendations to other educational institutions should be done with caution. This results from the understanding that other institutions may be comprised of students whose distribution of the various psychological types is not representative of the general population.

6. The mean and variance measures of the sample are representative of the population of graduate students in the School of Logistics and Acquisition Management at the Air Force Institute of Technology.

7. Often research findings are limited by the survey responses. According to Isaac and Michael, a sample size of 384 is sufficient to represent a population of 100,000, and maintain a 95% confidence interval (1982: 193). Therefore, with the sample size for this research being almost 700, the size should compensate for those who chose not to participate and adequately meet the 95% confidence interval to represent the population.

Key Terms

The following are key terms and acronyms that will be used throughout this report:

Air Force Institute of Technology (AFIT). An institute of higher learning located at Wright-Patterson Air Force Base, Ohio.

Myers-Briggs Type Indicator (MBTI). A survey to measure psychological type.

Myers-Briggs Indices: The bipolar ranges of indicators of psychological type, which includes the following:

Extravert and Introvert

Sensing and Intuition

Thinking and Feeling

Judging and Perceiving

Cognitive Set: The combination of perception (Sensing/Intuition bipolar ranges) and judgment (Thinking/Feeling bipolar ranges) scales of the Myers-Briggs Type Indicator (MBTI). These combinations assist in understanding an individual's ability to perceive and process information (Tucker and Underwood, 1993; 10).

Academic Environment: The aspects of the learning process associated with educational curricula, testing methods, classroom configuration, study strategies, subject matter preferences, and student/faculty interaction.

Educational Style Survey (ESS): A survey to collect data on preferences within the academic environment.

Summary and Overview

This chapter has introduced the general problem, the overall research question, and the relevant investigative questions. In addition, it has addressed the scope of the research as well as the assumptions made. Chapter II will contain a review of literature pertinent to this research effort. Chapters III will address the methodology to be used in this research, and Chapter IV will present the analysis of the data collected. Chapter V will present the conclusions of this research, and Chapter VI will address recommendations.

II. Literature Review

This chapter provides a review of relevant literature in the areas of psychological type and preferences within the academic environment. The first section introduces Carl G. Jung's theory of psychological type. It is followed by a discussion of the Myers-Briggs Type Indicator (MBTI), as developed by Katherine Briggs and Isabel Briggs Myers. The MBTI is an extension of Jung's theory and was designed to measure an individual's preferences within four dichotomous scales that indicate one's psychological type. The final section discusses research and literature on the academic environment.

Carl G. Jung

Jung's work in psychiatry dealt with the human psyche and the exploration of one's spirit and instinct as the basis for investigating the unconscious mind (Jacobi, 1973: 61). Jung's theory argues that the subsequent observable behavior and its seemingly random variations are actually quite orderly and consistent. This consistency is due to the basic differences in the way individuals use the three areas of orientation, perception, and judgment (Myers and McCaulley, 1985: 1). Jung's definition of these three areas is the basis for his theory of psychological types.

Orientation. Jung distinguishes between psychological types by first determining an individual's orientation (i.e., how one interprets his or her environment). The two basic types of introversion and extraversion describe how an individual focuses his or her inner thoughts. Introverts have an internal focus which results in information being influenced by their own feelings and views which are not outwardly visible to others (subjective).

Extraverts have an external focus and process information based on stimuli from the senses (objective). The determination of the predominant attitude (i.e., introversion or extraversion) provides the foundation which influences the other areas of perception and judgment (1923: 398).

Perception. Perception explains how one views people, objects, or ideas, and is comprised of the two categories of sensing and intuition. Sensing refers to the use of the five senses to interpret one's surroundings while intuition refers to the use of insight to further the interpretation of the other senses. As a result of these differences in perception, Sensing types are regarded as being realists and Intuitive types are regarded as being innovators.

When one couples the two perceptual types with the two orientation types, four psychological types result which are summarized as follows:

1. Introverted sensor: The internal focus of the Introvert is combined with the object-dependent Sensing perception. This results in a psychological type who understands the background aspects of the physical world, and who tests ideas in his or her own thoughts to determine if the ideas are supported by facts. An Introverted sensor may be viewed as the thoughtful realist (Myers and McCaulley, 1985: 37). They tend to be quiet, reflective, and contemplative in pragmatic ways.

2. Introverted intuitor: In this psychological type the Introverted preference is merged with the Intuitive perception. The result is one who is interested in knowledge, theory, and ideas which results in an aloof or detached mannerism. This type is viewed as being a thoughtful innovator (Myers and McCaulley, 1985: 37).

3. Extraverted sensor: The Extraverted preference, which is actively focused on the outer world, combines with the Sensing preference to produce a psychological type which are action-oriented realists. This type prefers to live life to the fullest with little need for self-reflection (Myers and McCaulley, 1985: 37).

4. Extraverted intuitor: In combining extraversion with the intuitive preference, the result is a psychological type which actively seeks out new possibilities and seizes on new objects or situations with great intensity. This produces a reputation for being an agent of change, which can be described as being an action-oriented innovator (Myers and McCaulley, 1985: 37).

Jung believed the interpretation of events through the senses cannot be explained in rational terms, and thus viewed perception as the irrational type (i.e., not requiring reason) (Jung, 1971: 226). Once an individual experiences and interprets an event through his or her irrational process, a rational process is used to make a decision concerning the event. The following area of judgment addresses this aspect.

Judgement. Jung's area of judgment describes how one draws conclusions, makes decisions, exercises judgment, and involves the two categories of Thinking and Feeling. Thinking types link ideas through logical connections and rely on the principles of cause and effect, while Feeling types come to decisions by weighing the relative values and worth of the issues (Myers and McCaulley, 1985: 12-14). When one couples the two judgment types with the two orientation types, four psychological types result which are summarized as follows:

1. Introverted thinker: One who is quiet and contemplative with concern for the basic principles that explain events or things.

2. Introverted feeler: One who is quiet and caring with concern for deep and enduring values.

3. Extraverted thinker: One who is active and energetic with the desire to make things happen in a reasoned, analytical, and logical manner.

4. Extraverted feeler: One who is sociable and friendly with the natural tendency to make things happen for the pleasure and welfare of others.

Table 1 depicts Jung's categories and subtypes.

Table 1
Jung's Categories and Subtypes

Subtype	CATEGORY	Subtype
Extraversion (E)	ORIENTATION	Introversion (I)
Sensing (S)	PERCEPTION	Intuition (N)
Thinking (T)	JUDGMENT	Feeling (F)

Dominant and Auxiliary Functions. Jung believed that the types described above are present to some degree in everyone and that understanding the dominance and interaction of the types is what make one's behavior predictable. The orientation categories of Introversion and Extraversion are used as the basic psychological types with each having four subcategories that account for the various combinations between the Perception and Judgment areas. The Perception and Judgment areas interact with one being the dominant function and the other being the auxiliary function (i.e., if the dominant function is a Perceiving one, then the auxiliary function must be a Judging one). Thus the two functions work together and provide an individual Perceiving and Judging capabilities.

Even though the concept of the dominant and auxiliary functions is central to Jung's theory (1971: 266-269), descriptions of the eight subcategories and the differences resulting from the dominant and auxiliary functions is not provided in Jung's writings. A greater understanding of Jung's theory in these areas is provided by the work of Katherine Briggs and Isabel Briggs Myers.

Myers and Briggs

The theory of Jung provided the conceptual framework on which Katherine Briggs and Isabel Briggs Myers developed the psychological instrument commonly known as the

Myers-Briggs Type Indicator (MBTI). The MBTI is a self-reporting, forced-choice survey that measures preferences between the dichotomous scales of Extraversion/Introversion, Sensing/Intuitive, Thinking/Feeling, and Judgment/Perception. The first three categories relate directly to Jung's areas of orientation, perception, and judgment that are discussed above. The fourth category of Judgment/Perception extends Jung's theory on the dominant and auxiliary functions and indicates the manner in which one deals with the outer world. The MBTI manual states that the fourth category "is designed to describe the process a person uses primarily in dealing with the outer world, that is, with the Extraverted part of life" (Myers and McCaulley, 1985: 2).

Extraversion/Introversion. Extraversion and Introversion are denoted as E and I, and are defined by Jung as being one's orientation. Extraverts are oriented primarily to the outer world (i.e., objects and people), while Introverts are oriented primarily to the inner world (i.e., concepts and ideas). McCaulley stated that "the analogy has been made that Extraverted energy penetrates the environment like radiant heating, while Introverted energy is generated more like a heat pump" (1980: 17). Several characteristics associated with Extraverted and Introverted students are identified in Table 2.

Table 2

Characteristics of Student Preferences for Extraversion and Introversion

Extraversion	**Introversion**
Prefers group activities and action projects	Prefers to work alone and library projects
Communicates well	Prefers written assignments
Readily offers opinions	Likes quiet space to work
Relatively short attention span	Greater capacity for sustained attention
Acts quickly/impulsively	Needs time for internal processing
Plunges into new experiences	Holds back from new experiences
Eagerly attends to interruptions	Dislikes interruptions
Likes to work by trial and error	Prefers mental tasks
Needs to be dominant	Desires achievement

(Lawrence, 1982: 70-71; 1984: 3; McCaulley, 1976: 2; and 1980: 17)

Sensing/Intuition. Sensing and Intuition are denoted as S and N, and are defined by Jung as being the irrational manner in which events and objects are perceived. Sensing refers to the use of the five senses in establishing what exists (i.e., physical surroundings), while Intuition refers to use of insight (i.e., the unconscious) to further the interpretation of the senses. Several characteristics associated with Sensing and intuition are identified in Table 3.

Table 3

Characteristics of Student Preferences for Sensing and Intuition

Sensing	Intuition
Is realistic and practical	Ability to see abstract
Acute powers of observation	Flashes of imagination
Prefers orderly sequence of details	Works with the whole concept instead of details
Memory for facts and details	Interested in new concepts
Good at tasks that call for carefulness, thoroughness, and soundness of understanding	Good at tasks that call for quickness of insight and in seeing relationships
Works steadily	Works in bursts of energy
Is patient	Jumps to conclusions
Prefers established routine	Prefers autonomy
Finds programmed learning restful as it is unhurried	Finds programmed learning boring as it is unhurried
Favors extrinsic motivation (i.e., tangible rewards)	Favors intrinsic motivation (i.e., self-fulfilling)

(Lawrence, 1982: 7, 72-73; Myers and Myers, 1980: 155, 200)

Several articles indicate that on the S-N scale, N's significantly outperform S's in tests designed to measure various academic aptitudes such as math and reading (Hoffman and Betkouski, 1981: 15-17; Lawrence, 1984: 5; McCaulley, 1980: 20).

Thinking/Feeling. Thinking and Feeling are denoted by T and F, and are defined by Jung as being the rational manner in which one makes decisions. Thinking relies on the principles of cause and effect to make logical connections. Feeling relies on weighing the relative values and merits of issues before making decisions. Several characteristics associated with Thinking and Feeling students are included in Table 4.

Table 4

Characteristics of Student Preferences for Thinking and Feeling

Thinking	Feeling
More interested in ideas and truths	More interested in people
More truthful than tactful	More tactful than truthful
Skill in applying logical analysis	Give weight to relevant personal values
Analyze and weigh facts	Prefers personal rapport
Objective and impartial	Warm, empathetic, and compassionate
Unaware of affect of own actions on others	Forecasts how others will feel
Upset by injustice	Upset by conflicts
Takes the solution of objective problems seriously	Takes ideals and emotional relationships seriously
Exhibits endurance	Desires affiliation

(Lawrence, 1982: 8, 74-75; McCaulley, 1980: 16; Myers and Myers, 1980: 200-201)

Judgment/Perception. Judgment and Perception are denoted by J and P, and are the extension of Jung's concept of dominant and auxiliary functions. The Judging/Perceiving function describes how one responds to the outer world; and, in conjunction with EI, identifies the dominant and auxiliary functions. Table 5 identifies several characteristics associated with Judging and Perceiving students.

Table 6 provides a summary of the MBTI preferences and briefly describes how each preference affects choices.

Table 5

Characteristics of Student Preferences for Judging and Perceiving

Judging	Perceiving
Decisive and orderly	Desires autonomy
Prefers traditional and formalized instruction	Prefers independent study
Prefers structured tasks and established goals	Prefers innovative tasks
Aims to be right	Aims to miss nothing
Considers time a resource	Considers time a hindrance
Likes to have things decided and settled	Comfortable in handling the unexpected
Self-regimented and steady, tolerant of routines	Flexible and adaptable, spontaneous and open
Has settled opinions	Has trouble making decisions

(Lawrence, 1982: 76-77)

Table 6

The Four Preferences of the MBTI

Type Letter	Index Preferences between:	Affects Choices as to:
EI	E Extraversion I Introversion	Attitude function of focusing one's dominant process in an external (E) or internal (I) manner
SN	S Sensing I Intuiting	Irrational function of Perceiving events or objects in an objective (S) or subjective (N) manner
TF	T Thinking F Feeling	Rational function of making decisions in a logical (T) or value-based (F) manner
JP	J Judgment P Perception	Identification of how one deals with the outer world (i.e., points to one's visible, Extraverted function)

(Myers and McCaulley, 1985, 2)

Psychological Type Groups. The four MBTI categories are designed to measure preferences within each dichotomous scale. The various combinations of the four categories result in sixteen possible combinations called "types", and are denoted by the four letters associated with the particular preferences. Table 7 identifies the typical representation of the sixteen types.

Table 7

The Sixteen Myers-Briggs Type Indicator Combinations

	SENSING		INTUITING	
	With Thinking	With Feeling	With Feeling	With Thinking
INTROVERSION				
Judging	ISTJ	ISFJ	INFJ	INTJ
Perceiving	ISTP	ISFP	INFP	INTP
EXTRAVERSION				
Perceiving	ESTP	ESFP	ENFP	ENTP
Judging	ESTJ	ESFJ	ENFJ	ENTJ

(Kroeger and Thuesen, 1992: 44)

(Note: In-depth descriptions of the characteristics associated with each type can be found in Appendix A.)

In addition to identifying one's overall psychological type, the MBTI also determines the relative strength of each preference for the individual. Figure 1 depicts an example of the preference strengths of a person who is typed as an ENTJ. The preference strength is considered slight if the relative strength is between 1-9, moderate if between 11-19, clear if between 21-31, and very clear if 33 and over. By considering the relative strengths of the preferences, one can reasonably conclude that other ENTJs in the world will not be identical to this person since the strengths of their preferences may differ from this person's strengths (Kroeger and Thuesen, 1992: 45).

```
Extraversion  |            X|              | Introversion
Sensing       |             |>>>>>>X       | Intuition
Thinking      |     X<<<<<<<<<|            | Feeling
Judging       |            X|              | Perceptive
              -|--------|-------|------|--------|-------|--------|--
              60      40      20      0       20      40      60

                 E: 7  N: 43  T: 35  J: 9
```

Figure 1. Preference Strengths

Some consider the development of the four preferences a lifelong process with the relative strength of the preferences varying as one matures and develops aspects of the nonpreferences (Kroeger and Thuesen, 1992: 47; Myers and McCaulley, 1985: 15; Lawrence, 1982: 14). For example, Figure 2 identifies the preference scores for an individual (ENTJ) over a three year period with the subject's age ranging between 30-33 years. This example is not intended to suggest that an individual's psychological type will change over his or her lifetime. It is presented in support of the concept that type development can be a continuous process and is influenced by an individual's environment and maturity in addition to in-born preferences.

Date	E	N	T	J
Sep 90	1	29	39	31
Mar 92	17	33	29	33
May 93	7	43	35	9

Figure 2. Preference Strength Variations

A summary of the variations in the relative strengths are:

1. E/I Scale: Variations on extraversion scale indicate that the strength of the individual's preference for extraversion fluctuated from slight (1) to moderate (17) to slight (7). The strength of the preference being slight indicates that the individual is fairly balanced between the use of extraversion and introversion, but that the preference for extraversion is stronger.

2. S/N Scale: Within this scale the variation indicates that the strength of the preference for intuition became stronger during the three year period. During this time the strength of the preference progressed from clear (29 on a scale of 21-31) to very clear (33 on a scale of 33 and over), with the third year's data indicating an increase in the relative strength of the preference within the very clear category (increase from 33 to 43).

3. T/F Scale: The variation in this scale is also between the clear and very clear categories, which indicates that the individual maintained a strong preference for Thinking (39 and 29 and 35).

4. J/P Scale: Of the four bipolar scales involved, this scale reflects the greatest change in the individual's relative preference strengths. The strength of the preference for Judging changed from that of clear (31 on a scale of 21-31) and very clear (33 on a scale of 33 and over) to slight (9 on a scale of 1-9) within the time frame identified. This significant change suggests that some event(s) in the individual's life may have affected the manner in which the person responded to and dealt with the outer world.

MBTI Cognitive Sets. The MBTI cognitive sets results from a combination of the Judgment (rational) and Perception (irrational) bipolar scales. The Judgment aspects are Thinking (T) and Feeling (F), and the Perception aspects are Sensing (S) and Intuitive (N). Cognitive style is described as being "the sense of preferred or habitual patterns of mental functioning: information processing, and the formation of ideas and judgments" (Lawrence, 1984: 2). The MBTI categories of perception (Sensing-intuiting) and judging (Thinking-Feeling) measure one's cognitive preferences. The perception category indicates how one prefers to perceive information, and the judging category indicates the preference in processing the information. The MBTI cognitive style type definitions follow from the belief of Myers and Briggs that the essence of Jung's theory of psychological types is due to the basic differences in the way individuals perceive and judge events and objects (Myers and McCaulley, 1985: 1; Myers and Myers, 1980: 1). Including the area of MBTI cognitive sets is relevant to this research since the manner in which knowledge is gained may provide insight into preferences within the academic environment. Abbreviated psychological type descriptions that result from a pairing of only the perception and judgment categories are contained in the following paragraphs.

Sensing plus Thinking (ST). Persons of this psychological type prefer to focus on facts which can be collected and verified by the senses. Decisions are made after an impersonal analysis of these facts using logical processes of reasoning (Myers and Myers, 1980: 5). People which fall in this category are perceived as being practical and matter-of-fact (Myers and Myers, 1980: 7). As students, their interests in learning emphasize the need for definitions (Hoffman and Betkouski, 1981; 23).

Sensing plus Feeling (SF). Within this psychological type the focus is also on facts which are collected and verified by the senses. Differentiation occurs as decisions are based on one's feelings regarding the personal and social value associated with the event or object. These individuals tend to be more interested in facts about people than in facts about things (Myers and Myers, 1980: 5-6). They are described as being sympathetic and friendly (Myers and Myers, 1980: 7), and, as students, their preference is in working together (Hoffman and Betkouski, 1981: 23).

Intuition plus Feeling (NF). Those people within this psychological type focus on the possibilities associated with events or objects which exceed interpretation through the senses (Intuition), and the ability to communicate the possibilities and the value attached to it (Feeling). These people are characterized as being enthusiastic and insightful (Myers and Myers, 1980: 6-7), and, as students, they prefer creative challenges. In addition, Kroeger and Thuesen state that this type is prone to taking criticism too personally (1988: 54).

Intuition plus Thinking (NT). The focus within this psychological type is also on possibilities, but with an approach which is based in impersonal analysis. These individuals tend to be logical and ingenious in solving problems, and desire new concepts and knowledge. However, this type tends to neglect any human aspect of a task is prone to "working any given point to death" in a classroom (Myers and Myers, 1980: 6-7; Hoffman and Betkouski, 1981: 23; Kroeger and Thuesen, 1988: 55).

The Academic Environment

Preferences within the academic environment are based on data collected through the Educational Style Survey (ESS). The areas addressed include classroom configuration, subject matter difficulty, study strategies, testing methods, student-faculty interaction, and adaptability to academic stress. Relevant literature is addressed in the following paragraphs.

Written Testing Methods. Written examinations test material in either a subjective or objective manner, with some examinations using a combination of both (i.e., "Explain why the following statement is either true or false"). In describing the basic differences between these types of questions, Kemp states that subjective tests generate essay-oriented responses where objective tests involve responses that are true/false or multiple choice, or require matching or fill-in-the-blank. Kemp believes that subjective tests offer students the flexibility of creating their own responses, which provides insight into how students organize their thoughts and evaluate ideas. In contrast, objective tests limit the available responses (true/false, multiple choice, and matching) or require recall of key words/phrases as in fill-in-the-blank questions (Kemp, 1977: 93-94).

In the area of MBTI psychological types, Provost and Anchors theorize that different testing methods favor particular MBTI psychological types (1987: 23). Tests which emphasize one's ability to memorize facts (i.e., objective tests) are more advantageous to Sensing and Judging students. The previously identified student characteristics of Sensing types support this belief as Sensing students have a good memory for facts and details. The Judging student's characteristics are not as explicitly related, but one may infer that the qualities of being decisive and aiming to be right may support a preference for these types of tests. Essay (i.e., subjective) tests, which require more hypothesizing, tend to favor Intuitive students. Provost and Anchor refer to the Intuitive student's ability for abstraction as the reasoning for this conclusion (1987: 201).

While this information does not address the testing method preferences of the MBTI psychological types, it may provide support for relationships that may be identified through this research.

Subject Matter Difficulty. In the area of subject matter difficulty, one could logically reason that a number of factors contribute to whether a student identifies a particular subject as being difficult. While no research was located that defines explicit factors in determining subject matter difficulty, studies do exist that address student competence, persistence, and interest or enthusiasm for various subjects. The combination of which may provide insight into which subjects may be perceived as "difficult" or "least difficult."

Myers and McCaulley relate type theory to the three educational achievement aspects of aptitude, application, and interest. These three aspects are addressed individually in the sections that follow.

Aptitude: Research by Myers and McCaulley indicates that aptitude relates to an interest in concept and ideas (characteristics of an Introvert) as well as the capacity to work with abstraction, symbols, and theory (qualities of Intuitive (N) types) (1985: 95). These results imply that Introverted and Intuitive types may have an advantage over Extraverts and Sensing types in a college environment since the typical college environment places significant emphasis on dealing with abstract thoughts and verbal words and symbols (Pritcher and Blaushild, 1970: 27; Hoffman and Betkouski, 1981:22). Conversely, Extraverted and Sensing types may be expected to have less of an advantage. According to Hoffman and Betkouski, one would expect that since Extraverts are so active in the world of people and things, they would have a lower priority for reading and processing information (1981: 21). In addition, Sensing types, since they favor working through their five senses, would be expected to prefer a way to test the worth of ideas and skills through actual application. However, according to Hoffman and

Betkouski, the educational system favors testing of ideas and skills in the inner world of the mind (1981: 22). Thus, it would appear that the activities of Sensing types would be discouraged, which may hinder learning.

Research by Hoffman and Betkouski (1981) addresses several aspects of aptitude with regards to MBTI psychological types. Their research relates aptness in reading on the Extravert/Introvert and the Sensing/Intuitive dimensions. They report that Introverts are more likely to spend time reading while Extraverts tend to be more active in the world of people and ideas. On the Sensing/Intuitive dimension, they report that Reading Index scores are consistently higher for Intuitive types. Their results are supported by Lawrence (1984: 8 and 12) who indicates that Introverts and Intuitive types prefer reading as a learning preference. Additional findings by Hoffman and Betkouski state that INTPs excel in science, and that Intuitive types outperform Sensing types in math achievement (1981: 15).

Application: Success in the area of application is discussed in relationship to the Judging (J) preference since J types obtain an edge from the ability to focus their energies to required tasks even when the tasks are not interesting to the student (Myers and McCaulley, 1985: 95 and 102). Research by Lawrence can be used to support this concept by linking the characteristics of closure and completion, which are associated with Judging types, to one's ability to apply oneself to required tasks (1984: 12). On the other hand, Perceiving types generally have difficulty in coming to closure and consider time a hindrance (Lawrence, 1982: 77). As a result, they may not be able to decide when enough data and information has been collected in order to complete assignments in the time specified. In addition, the open and spontaneous nature of Perceiving types (Myers and McCaulley, 1985: 14) may result in them being easily distracted from their studies.

Interest: The MBTI measures areas of interest across all of the bipolar scales by using the question, "Which do you like best - math, English, science, history, practical skills, music, art?" (Form G of the MBTI). Table 8 identifies the choices that were significantly preferred ($p<.05$) by each type (Myers and McCaulley, 1985: 110). The table indicates that practical skills were preferred by six of the eight Sensing types and none of the Intuitive types; mathematics was chosen by ST cognitive types; and science was preferred by NT cognitive types. Myers and McCaulley state that mathematics implies clarity, certainty, and accuracy, which appeals to Sensing and Thinking types; and science implies discovery, analysis, and theory, which appeals to Intuitive and Thinking types.

Table 8
Academic Subjects Significantly Preferred By Each Type
(From the Choices on the Form G Answer Sheet)

ISTJ Mathematics Practical Skills	**ISFJ** Practical Skills	**INFJ** Art English	**INTJ** Science
ISTP Mathematics Practical Skills	**ISFP** Practical Skills	**INFP** Art English Music	**INTP** Art Science
ESTP History Mathematics Practical Skills	**ESFP** History	**ENFP** Art English Music	**ENTP** Art Science
ESTJ Mathematics Practical Skills	**ESFJ** Mathematics Music	**ENFJ** Art English Music	**ENTJ** English Science

(Myers and McCaulley, 1985: 110)

Learning Preferences of the Cognitive Sets. In the area of the cognitive sets, Lawrence identifies the learning preferences in his 1984 research involving the synthesis of learning styles. Table 9 summarizes some of his findings in this area.

Table 9

Cognitive Sets' Learning Preferences

_ST_ Types Demonstrations Labs	**_SF_ Types** Instruction with personal involvement Student-led presentations
_NF_ Types Learn through personal relationships Creative opportunities	**_NT_ Types** Self-instruction Reading

(Lawrence, 1984: 13)

Study Strategies - Use of Study Groups: Research by Lawrence reports that Introverts prefer to work individually while Extraverts prefer working with a group (no particular size indicated). He also argues that Feeling types prefer learning through personal relationships and attend help sessions (1984: 12). From these findings one might reasonably conclude that group involvement is preferred by Extraverts and Feeling types, and not preferred to the same level by Introverts and Thinking types.

Adaptability to Academic Stress. Within the area of higher education, research by Vincent Tinto (1987: 78) states that one of the primary reasons for student departure from college is difficulty in adjusting to the more challenging intellectual demands (1987: 48 & 78). As a result, Tinto determined that student departure takes the form of voluntary withdrawal or academic dismissal, with the former being more common (1987: 83). An additional area associated with academic stress is that of academic success (i.e., grade point average). All three areas will be addressed in the following paragraphs.

Voluntary Withdrawal. The study voluntary withdrawal revealed information concerning personal interaction between students and with faculty members, and student personality traits. Tinto states that frequent contact with the faculty appears to be a particularly important element in student persistence (1987: 65-66), and that the commitment of an individual to an institution appears to be most strongly influenced by the quantity and quality of individual contact with other students and with the faculty and staff of the institution (1987: 185). He states that wide-ranging contact inside and outside of the classroom generally leads to heightened commitment and enhances the likelihood of a student remaining. Deborah Hemmelgarn also made conclusions about the influence of faculty in encouraging persistence among graduate students. She believed that socialization to graduate education was affected by the perceived warmth and helpfulness of faculty and the feedback that faculty provided to the students (1978: 21 and 68). She concluded that students are more likely to successfully complete graduate education if they are able to identify with the faculty and the chosen discipline (1978: 17).

By applying Tinto's research to the descriptions of the MBTI psychological types, one might expect that Extraverts and Feeling types, which both exhibit a preference for dealing with people, would seek interaction with other students and the faculty. Accordingly, these types would be more likely to experience heightened commitment, and would have a greater likelihood of remaining at the institution. However, Tinto states that even though interaction by itself does not guarantee student persistence, the lack of interaction almost always improves the likelihood of voluntary withdrawal (1987: 117).

Tinto also investigated the psychological view of departure. He states there is little evidence to support the theory that there is a unique personality profile that describes a student who is more likely to withdraw (1987: 78 and 87). As a result of his research he stated that "At one time or other virtually every attribute of personality has been cited as being related to the likelihood of departure" (1987: 78-79). To support this statement, Tinto referenced specific independent studies that provide conflicting personality descriptions of someone likely to withdraw. Following is a listing of the studies Tinto references and their associated personality descriptions of withdrawing students (1987: 79):

1. Suczek and Alfert (1966): Value sensations, are imaginative, enjoy fantasy, and are motivated by rebelliousness.

2. Astin (1964): Are more aloof, self-centered, impulsive, and assertive.

3. Trent and Ruyle (1965); Keniston (1968): Are more autonomous, mature, intellectually committed, and creative.

4. Grace (1957); Brown (1960); Beahan (1966): Are irresponsible, anxious, impulsive, rebellious, unstable, immature and unimaginative.

In reviewing these descriptions, it is possible to identify conflicting traits between descriptions as well as identifying conflicting preferences associated with the MBTI psychological types. For example, being imaginative is often descriptive of the Intuitive types, which according to previously identified research, is a type that has a distinct advantage in the college environment (Myers and McCaulley, 1985: 95; Pritcher and Blaushild, 1970: 27; and Hoffman and Betkouski, 1981: 22). It is noted that Suczek and Alfert and Trent, Ruyle, and Keniston identify imaginative or creative students as being those likely to withdraw, while Grace, Brown, and Beahan identify the unimaginative student as being one most likely to withdraw

As a result of his findings, Tinto states that even though there may be some truth to the psychological view of departure, it is only a partial truth. Based on the conflicting psychological traits identified, it appears that students may withdraw for a variety of reasons. He adds that individual behavior is also a function of one's environment, and as such, student departure is influenced by the particular institution as well as the student body being studied (1987: 87). Tinto's conclusions are supported by the research findings Hemmelgarn in her eight factors that contributed to voluntary withdrawal from graduate studies. These factors are lack of time and energy, financial problems, job precludes continuing, transfer to another university, disruption of family life, transportation problems, lack of support from significant others, and child care problems (1978: 81). She addresses the consumer orientation of dropouts as being a factor in dropping out as it contradicts the scholarly traditions of graduate education (1978: iv). The consumer orientation is described as the desire not to put oneself through personal hassles or deprivation in order to continue or complete a graduate education -- lack of time and energy (Hemmelgarn, 1978: 62).

In relating voluntary withdrawal to the MBTI psychological types, the research of Spann, Newman, and Matthews (1991) indicates that Extraverts tend to drop out when enrolled in majors overrepresented by Introverts, and Introverts tend to drop out when enrolled in majors overrepresented by Extraverts (1991: 43). Their research also states that the highest percentage of persisting students are Introverted Sensing types. To support this conclusion, they cited an Introvert's preference for the clarity of concepts and ideas; and the Sensing types' qualities of perseverance, adaptability to routine, and appreciation of facts - qualities that they believed were necessary to academic success (1991: 44). However, their research results differ slightly from those of Provost (1985). Provost's research (1985) addresses voluntary withdrawal by linking student adjustment and persistence to non-involvement in college activities. Her research indicates that students with the psychological types of ISTP, ESTP, and ISFP are mostly likely to leave college (1985: 19-20). She states that type theory suggests these students "tend to be less organized by nature, more passive in relationship to college environment, less interested in theoretical courses and in learning for its own sake" (1985: 20).

Provost also identified those psychological types which remained in the college environment. Following is a listing of the students' psychological types which persisted in college, including a brief statement as to the qualities which contributed to their persistence.

1. ESTJ: Ability to apply themselves when necessary, even though they are not interested in certain subjects.

2. ENTJ: Able in studies, and are usually good in anything that requires reasoning and intelligent talk.

3. ESFP: Outgoing, accepting, know what's going on and join in eagerly, and find remembering facts easier than mastering theories.

4. ESFJ: Talkative, popular, conscientious, born cooperators, and active committee members.

Provost observes that all four of these types prefer extraversion, and three of the four types have a Judging preference. She attributes the perseverance of the Extraverts to their more active involvement, and the perseverance of the Judging types is due to their preference for being more organized and planning their time.

Academic Dismissal versus Academic Success. In the area of academic dismissal, Tinto's research indicates that student departures result from deficiencies in reading, writing, and mathematical skills (1987: 52). Pitcher and Blaushild (1970: 27) emphasize the need for skills in dealing with abstract thoughts and verbal words and symbols:

> The skills required to complete a four year college course successfully are unique...highly verbal with a continuous emphasis upon the communication of ideas through reading, writing, speaking, and listening. The possession of an adequate vocabulary and the capacity to add new words at a rapid rate is essential if one is to achieve at an acceptable level. (1970: 27)

Pitcher and Blaushild state that there are two basic prerequisites that transcend all subjects and testing situations: 1) the ability to understand the question and 2) the ability to express what has been learned in writing (1970: 151). Even though both skills are essential, Pitcher and Blaushild assert that testing situations (especially essay exams) emphasize the need for effective writing skills. The authors add that the inability to write effectively occurs most often among all of the language problems(1970:34).

Research on the MBTI psychological types in this area addresses academic success as opposed to that of academic failure. In addressing one's academic success, Myers and McCaulley state that even though all types may perform will in college and graduate school, those with a preference for introversion and intuition (IN types) will have a relative advantage since their interests match academic tasks (Myers and McCaulley, 1985:96, and McCaulley, 1974: 7). Lawrence attributes the success of the IN type to the concepts that overall instruction favors IN types and that those who write textbooks, standardized tests, and intelligence tests, are most often IN types (1979: 36 and 42-43). The research results of Schurr and Ruble aid in supporting this concept as they report that the higher average grades in general studies are achieved by the INTJ and INFJ psychological types, and the lower grade averages belonged to the ESTP and ESFP psychological types (1986: 28).

Schurr and Ruble also conclude that Judging types exceed Perceiving types in overall achievement; and Introverts and Intuitive types exceed Extraverts and Sensing types for the four measures of overall achievement, high school class percentile, standardized verbal scores, and math scores (1986: 25). They state that the current approach to presenting material and structured learning is better suited to Introverts since they are able to work alone efficiently, concentrate well, and avoid outside distractions; Intuitive types due to their natural flair for abstract thinking and tolerance for theory; and Judging types since they live life in a planned, orderly, and organized way. The bipolar opposite to each of these preferences found the current approach not as rewarding since they tend to have broad interests and natural flair for interpersonal interactions (Extraverts); they like to work with known facts and respond to concrete examples and practical applications (Sensing types); or they preferred to live life in a flexible, spontaneous, and adaptable manner (Perceiving types) (1986: 35).

The use of grade point averages in determining academic success is also addressed in the study by Provost on college attrition (1985). Her results indicate that the largest differences between grade point averages occur on the Judging-Perceiving scale, with the Judging types having the higher averages (1985: 17-18).

Summary

This chapter discussed Jung's theory of psychological type, and the efforts by Myers and Briggs to expand and operationalize his theory through the development of the MBTI. A review of the literature relevant to the academic environment and the MBTI psychological types was provided also. The following chapter describes the methodology that will be used for this research.

III. Methodology

This chapter focuses on the methods used to test the research question and the seven investigative questions. The chapter includes sections which describe the sample population, the data collection plan, the survey instrument, and the data analysis technique.

Sample Population

The sample for this research consists of graduate students who attended the School of Logistics and Acquisition Management during the years 1985-93. This sample was selected due to the accessibility of participants, the voluntary aspect of their participation, and the timeliness of their extensive involvement in the academic environment.

Data Collection

This research analyzes data collected on psychological type and preferences within the academic environment such as study strategies, classroom configurations, and testing methods. Data on psychological type and preferences in the academic environment were collected through the use of the Myers Briggs Type Indicator (MBTI) and the Education Style Survey (ESS). The MBTI is a self-report survey which is used to aid individuals in understanding how they reason and react in various situations (Myers and McCaulley, 1985: 1). The ESS is also a self-report survey and is used to identify educational preferences of students for research purposes (Tucker and Underwood, 1993: 38). A more detailed description of each survey instrument is discussed below.

The Myers-Briggs Type Indicator (MBTI). The Form G survey was used to determine psychological type. Each Form G was accompanied by an optical scan answer sheet which was scored by a computer program that tabulated and reported individual results. This scoring was accomplished following procedures outlined in *A Guide to the Development and Use of the Myers-Briggs Type Indicator* (Myers and McCaulley, 1985). As a result, each student was classified into one of sixteen possible MBTI psychological types. Included with the individual results was the strength of each student's preferences for the four dichotomous MBTI scales of Introvert/Extravert, Sensing/Intuiting, Thinking/Feeling, and Judging/Perceiving.

To establish reliability of the MBTI, test-retest procedures have been used to determine if individuals will choose the same four preferences on retest as were chosen on the original test. Results from previous research indicate that when changes do occur in retest, the changes are most likely in areas where the preference scores were low on the initial test (Myers and McCaulley, 1985: 170-171).

The validity of the MBTI as an indicator of psychological types has been established through correlations with the Jungarian Type Survey, Gray-Wheelwright, and several self-estimates of type. These correlations indicate that the same basic constructs are being consistently measured across the various survey instruments (Myers and McCaulley, 1985; 209-211).

Education Style Survey (ESS). This survey was developed by Dennis Campbell and is used as a collection device for obtaining preferences within the academic environment. This survey allows students to identify their preferences based on a multiple choice format so that differentiation can be determined. The ESS is manually answered and scored, and addresses three aspects of the academic environment. The first section focuses on preferences in subject matter and utilization of study groups. The second section addresses physical layout of the classroom, individual learning strategies and exam preferences. The third section deals with faculty interactions and student stress management.

The validity of the ESS was established by Campbell in two phases. The first phase occurred during the survey's development when the focus of the overall survey was determined, the specific question format was established, and the selection of scales was made (Tucker and Underwood, 1993: 50). In the second phase, Campbell solicited and received feedback from peers and members of the instrument's target population. The feedback was used to adjust the survey to collect data as agreed to by all developers From these results, the survey was judged to contain content validity (Tucker and Underwood, 1993: 50).

Data Analysis

The Chi-Squared Multinomial Distribution Analysis Test was used to compare sampling distributions. The selection of the Chi-square analysis tool is based on its usefulness in tests involving nominal data where answers include categories such as "favor-undecided-against" or classes such as "A, B, C, or D" (Emory and Cooper, 1991: 536). Since the MBTI is a forced-answer survey between two dichotomous responses resulting in nominal data, a Chi-square test will be used in this analysis.

For this test, two distributions are established: one represents expected values and the other represents observed values. The ESS was stratified by MBTI psychological type and cognitive sets. From this, a set of frequencies for each ESS question was obtained across the MBTI scales and cognitive sets. Table 10 depicts how the data are tabulated for the sample question "Which class room arrangement do you prefer MOST?" (Check one.)."

Table 10
Sample Procedure for Analysis

	Rows	Semi-Circle	Circle	Clustered Groups	Scattered	Totals	
Extravert							Step 1 \ Step 2
Introvert							/ Step 2 Step 1
Sensing							
Intuiting							
Thinking							
Feeling							
Judging							
Perceiving							

Analysis for the research measurement questions follows a four step process.

1. The first step is to determine what preferences, if any, exist for each question within each MBTI dichotomous category. A chi-square test is performed to compare observations to expected values.

In the sample table above, frequency counts are determined for Extraverts for their preferred classroom arrangements. The observed frequency count for responses "rows" through "scattered" are compared to their expected value and chi-square analysis is used to determine how well the observed frequency distributions fit the expected frequency distributions. This will support the acceptance or rejection of the null hypothesis. Acceptance of the null hypothesis would indicate that observations are not rare events, but occur as expected. Failure to accept the null hypothesis would indicate that observations are rare and do not occur as expected. Thus they provide evidence to reject the hypothesis and accept the alternative hypothesis.

2. The second step is to determine preferences between the MBTI dichotomous categories (Introvert versus Extravert, Sensing versus Intuiting, etc.). Again the chi-square test is used to test between the responses. According to Emory and Cooper, the chi-square test is also appropriate for measuring differences between groups (1991: 540). Referring to the sample table, the frequency of response "A" provided by Extraverts is compared to the frequency of response "A" by Introverts. The distribution of Extravert responses provides the expected values and the distribution of Introvert responses provides the observed values. Chi-square analysis uses these values to determine if there is a significant difference between distributions of MBTI dichotomous type responses to each question.

3. The third step addresses the cognitive types which combine the Sensing-Intuiting and Thinking-Feeling indicators into four scales. As in the first step, chi-square analysis is used to indicate how accurately the observed frequency distributions fit the expected frequency distributions from each of the four cognitive sets (Intuitive-Thinking, Intuitive-Feeling, Sensing-Thinking, and Sensing-Feeling). Table 11 is presented to clarify this step using the sample question, "Which class room arrangement do you prefer MOST? (Check one)."

Table 11

Sample Procedure for Analysis

	Rows	Semi--Circle	Circle	Clustered Groups	Scattered	Totals	
Intuitive-Thinking							Step 3 \ Step 4
Sensing-Feeling							/ Step 4 Step 3
Intuitive-Feeling							
Sensing-Thinking							

4. The fourth step is to determine if significant differences existed between cognitive set dichotomous types. Chi-square analysis is used to determine if significant differences existed between these sets. Referring to the sample table, the frequency of response "A" provided by Intuitive-Thinking is compared to the frequency of response "A" by Sensing-Feeling. The distribution of Intuitive-Thinking responses provides the expected values and the distribution of Sensing-Feeling responses provides the observed values. Chi-square analysis uses these values to determine if there is a significant difference between distributions of cognitive set dichotomous type responses to each question. This analysis was accomplished between Intuitive-Thinking and Sensing-Feeling and between Intuitive-Feeling and Sensing-Thinking dichotomous cognitive types.

The four step analysis procedure is also applied to the total sample and on those with differentiated preferences (MBTI strength indices greater than 9 for the single letter). The MBTI determines the relative strength of each preference for the individual. The strength is considered slight if the relative strength is between 1-9, moderate if between 11-19, clear if between 21-31, and very clear if 33 and over. In considering these relative strengths, one can conclude that Extraverts with a slight preference would not be identical to the Extravert with a preference which is more than slight. (Kroeger and Thuesen, 1992: 45). The differentiated preferences, as defined in this research, are Myers-Briggs letter types who exhibit more than a slight preference for a MBTI letter.

Using steps 1 and 2, the group of undifferentiated dichotomous types (those with slight preferences for dichotomous MBTI letters) were added together and compared to each appropriate differentiated letter to determine if the observed values were the same or different from the expected values. For example, undifferentiated Extraverts and Introverts, are combined into a group (observed value) and tested against differentiated Extraverts and differentiated Introverts (expected value).

Throughout this study, all tests of hypotheses will use at least an .05 level of significance.

Summary

This chapter discussed the methodology used in approaching the research objective and investigation questions. It provided a description of the research design, the survey population, the method of data collection, and the data analysis technique.

The next chapter provides the data analysis and discusses the statistical analysis of the data.

IV. Data Analysis and Results

This chapter presents the data analysis and results for each of the investigative questions in this research. This chapter is divided into seven sections, each of which is devoted to one of the investigative questions.

Investigative Question 1

Are the AFIT students' psychological types, as measured by the MBTI, similar to the general population?

The sample selected for this research consists of students completing a Master of Science degree at the Air Force Institute of Technology during the period of 1988 through 1993.

A comparison is made of MBTI single letter types to an independent estimate of MBTI type for the general population. The estimate is from the SRI International study of Values and Lifestyles (VALS), conducted in 1983 (McCaulley and others, 1985: 4-7). The SRI estimate uses a randomly stratified sample of the US populations and provides an expected value for the test of the sample observations.

The sample distribution of AFIT student dichotomous MBTI types and cognitive sets is shown in Tables 12 and 13.

Table 12

AFIT Sample and SRI VALS Single Letter Distributions

N=695	E	I	S	N	T	F	J	P
AFIT Sample	283	412	429	266	578	117	445	250
Percent	40.72	59.28	61.73	38.27	83.17	16.83	64.03	35.97
SRI VALS Percent	40.44	59.56	75.93	24.07	50.40	49.60	66.16	33.84
Significant Differences								
Chi Square	.002	.001	2.66	8.38	21.31	21.65	.07	.13
Significance	----	----	----	**	***	***	----	----

1 Degree of Freedom	Test Statistic	Significance	Symbol
	3.841	.05	*
	6.635	.01	**
	10.827	.001	***

Table 13

AFIT Sample and SRI VALS Cognitive Set Distributions

N=695	ST	SF	NF	NT
AFIT Sample	377	52	65	201
Percent	54.2	7.5	9.4	28.9
SRI VALS Percent	39.09	36.84	12.76	11.31
Significant Differences				
Chi Square	5.84	23.37	.88	27.36
Significance	----	***	----	***

3 Degrees of Freedom	Test Statistic	Significance	Symbol
	7.815	.05	*
	11.345	.01	**
	16.268	.001	***

Within each of the dichotomous scales, the greater proportion are Introverts (59.3%), Thinking (83.17%), Judging (64.03%) and Sensing types (61.73%). Within the cognitive sets, the two with the greatest proportions are Sensing-Thinking types (54.2%) and Intuitive-Thinking types (28.9%).

The overall sample distribution was compared to the SRI VALS estimates of the general population. The results of the chi-square analysis show that there is a difference between MBTI single letter type and the SRI counterpart for Intuitive, Thinking and

Feeling types. For cognitive sets, there is a difference between the sample and SRI counterparts for Intuitive-Thinkers, and Sensing-Feelers.

The AFIT sample is different from the general population for Intuitive, Thinking, and Feeling types. For cognitive sets, the AFIT sample is different from the general population for Intuitive-Thinking and Sensing-Feeling types.

Investigative Question 2

What are the relationships between one's psychological type and one's preference for classroom configuration?

There were three measurement questions asked in the Educational Style Survey that assist in answering the investigative question. These measurement questions are: "*Which classroom arrangement do you most prefer*?", "*...Where do you prefer to sit in a classroom*?", and "*Which classroom arrangement has been used MOST during your classes*?".

The investigative question is answered by using the chi-square analysis procedure in four steps for each measurement question. The procedure and results for each measurement question are presented.

Analysis.

"*Which classroom arrangement do you prefer most?*" There were five possible responses to this question. The potential choices were: rows, semi-circle, circle, group clusters, or a scatter classroom. Choices were provided as pictures and the student was asked to choose only one response.

For the analysis of this question, each Myers-Briggs single letter type was first tested to determine if there were preferences within these types that were different from the expected preferences (Figure 3). For example, Extraverts were tested to determine if there was a preference in classroom arrangement different from the expected value. Next, Introverts were tested, then Sensors, Intuitors, Thinkers, Feelers, Judgers and Perceivers. Analysis was performed on the complete sample of single letter types, on those who were "differentiated" for a preference for the type and "undifferentiated" for a preference type. Differentiated preferences are determined by reviewing MBTI scores and analyzing results only for those types whose MBTI indices are greater than 9 for that letter. Undifferentiated preferences are those types whose MBTI indices are less than 9. This analysis was performed to determine if discernible preferences were present for those with a defined MBTI category versus those with a relatively undefined category. This analysis should shed light on whether or not preferences may differ with the strength of one's MBTI category. The complete analysis for these tests are at Appendix B.1.a.

Ho: $p_1 = p_2 = p_3 = \ldots = p_k = 1/k$ (No preference)

Where p_1 is the probability that no choice is preferred, p_2 is the probability that choice A is preferred, and so on through p_k.

Ha: At least one of the probabilities exceeds 1/k.

Test Statistic: $\chi^2 = \sum_{i=1}^{k} [ni - E(n)i\,]^2 / E(n)i$

Where ni = npi, the observed number for each choice and E(n)i = 1/k*n, the expected number for each choice. The total number of students in the group equals n.

Critical χ^2 values for k-1 degrees of freedom are listed in the appropriate appendix for each question.

χ^2 Test statistic values are listed in appropriate appendix for each question.

Figure 3. Chi-Square Analysis for Preferred Choices Within Distributions

The next step was to determine if significant differences existed between MBTI dichotomous types. Chi-square analysis was used to determine if significant differences existed between these types, one used as the expected distribution and the other one used as the observed distribution. This analysis was accomplished between Extraverts and Introverts, Intuitive and Sensing types, Thinking and Feeling types, and Judging and Perceiving types (Figure 4). Analysis was completed on the total sample and on those with differentiated preferences (MBTI indices greater than 9 for the single letter). In addition, the group of undifferentiated dichotomous types were added together and compared to each differentiated dichotomous letter to determine significance of the group of undifferentiated types. For example, undifferentiated Extraverts and Introverts were combined into a group and compared to differentiated Extraverts and differentiated Introverts. The complete analysis for these tests are at Appendix B.1.a.

Ho: $p_{1,1} = p_{2,1}$, $p_{1,2} = p_{2,2}$, ... , $p_{1,k} = p_{2,k}$

Where $p_{1,1}$ is the probability that choice i is preferred by the first MBTI dichotomous letter and $p_{2,1}$ is the probability that choice i is preferred by the second MBTI dichotomous letter.

Ha: At least one $p_{1,i}$ does not equal $p_{2,i}$

Test Statistic: $\chi^2 = \sum_{i=1}^{k} [n_i - E(n)_i]^2 / E(n)_i$

Where $n_i = p_{2,i}$ the observed number of members from the second MBTI dichotomous type who selected a choice. $E(n)_i = p_{1,i}\, n$, the expected count of the second type members who select choice i based on the first type's preference probability for choice i for each possible outcome.

Critical χ^2 values for k-1 degrees of freedom are listed in the appropriate appendix for each question.

χ^2 Test statistic values are listed in appropriate appendix for each question.

Figure 4. Chi-Square Analysis for Preferred Choices Between Distributions

The third step was to determine significant responses from each of the four cognitive sets. Analysis on cognitive sets was accomplished using the same technique discussed in Figure 3. For example, Intuitive-Thinking (NT) types were tested to determine if there was a preference in classroom arrangement, different from the expected value. Next, Intuitive-Feeling (NF) types were tested, then Sensing-Thinking (ST) and Sensing-Feeling (SF) types. Analysis was performed on the complete sample of cognitive sets and on those who showed a "differentiated" preference for the set. Analysis was not completed for undifferentiated groups since the expected value for most questions was less than 5. The complete analysis for these tests are at Appendix B.2.a.

The final step was to determine if significant differences existed between cognitive set dichotomous types. Chi-square analysis was used to determine if significant differences existed between the observed and expected values of these sets. This analysis was accomplished between NT and SF and between NF and ST (Figure 4). Again, analysis was completed on the total sample and on those with differentiated preferences. The complete analysis for these tests are at Appendix B.2.a.

The same four step procedure was accomplished for the other two questions.

"Where do you prefer to sit in a classroom?" Only those people who responded that they prefer to sit in rows or in a semi-circle in the previous question were asked to answer this question. Students were asked to select one response from two groups of options. Group one includes "Left", "Center", or "Right"; group two includes "Front", "Center", or "Rear". Chi-square statistical values and conclusions for these questions for MBTI dichotomous types (total and differentiated) and dichotomous cognitive sets (total and differentiated) are found in Appendices B.1.b. and B.1.c.

"Which classroom arrangement has been used MOST during your classes?" There were five possible responses to this question. The potential choices were: rows, semi-circle, circle, scattered groups, and a scatter classroom. Choices were provided as pictures and the student was asked to choose only one response. Chi-square statistical values and conclusions for these questions for MBTI dichotomous types (total

and differentiated) and dichotomous cognitive sets (total and differentiated) are found in Appendices B.2.b., and B.2.c.

Results.

"Which classroom arrangement do you most prefer?" There were three dominant answers to this question throughout the MBTI groups. These responses were preferences for a classroom configuration set in rows, a semi-circle or a circle. In reviewing these results, each configuration can be described by addressing the structure that each exhibits. The row configuration may be considered by some to be the standard configuration since most classrooms are arranged in this fashion. It can be described as being more structured, and may be viewed by some as offering greater anonymity since students may be less visible when seated behind other students. In addition, the emphasis is on the instructor at the front of the classroom. The opposite of the row configuration would be that of the circle configuration. This configuration allows for increased visibility of all students as well as the instructor. The third configuration of semi-circles provides a blending of these two extremes. It retains the structure associated with an instructor-centered classroom, plus there is increased visibility with the other students. However, since more than one semi-circle is required, there is some anonymity provided since students may seat themselves behind other students.

Table 14 summarizes the findings for MBTI single letter groups and Table 15 summarizes the findings between MBTI dichotomous types. For each single letter and each sub-category for that letter, responses significantly different from the expected values were found for the semi-circle configuration.

Table 14

Level of Significance for MBTI Single Letter Types: Classroom Configuration Preference

MBTI Category	N	Rows	Semi-Circle	Circle	Group Clusters	Scatter
All Es	283	*	***	*	----	----
Diff Es	240	----	***	*	----	----
All Is	412	***	***	----	----	----
Diff Is	261	***	***	----	----	----
Undiff Es & Is	194	***	***	----	----	----
All Ss	429	***	***	----	----	----
Diff Ss	355	***	***	----	----	----
All Ns	266	----	***	**	----	----
Diff Ns	197	----	***	----	----	----
Undiff Ss & Ns	143	----	***	----	----	----
All Ts	578	***	***	----	----	----
Diff Ts	494	***	***	----	----	----
All Fs	117	----	***	*	----	----
Diff Fs	70	----	**	----	----	----
Undiff Ts & Fs	131	----	***	----	----	----
All Js	445	***	***	----	----	----
Diff Js	317	***	***	----	----	----
All Ps	250	***	***	----	----	----
Diff Ps	170	*	***	----	----	----
Undiff Js & Ps	208	***	***	----	----	----

Level of significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

In comparing the preferences of the differentiated Extraverts and the differentiated Introverts, the differentiated Extraverts also had a preference for the circle configuration while the differentiated Introverts also had a preference for the row configuration. One might expect this result since Extraverts prefer the outer world of activity and action (Myers, 1980: 14-15), as well as being able to communicate well (Lawrence, 1982: 70). These characteristics may be fostered through the openness and visibility offered in a circle configuration. In contrast, Introverts prefer to work alone and like quiet space to work.

The structure offered by a row configuration may appeal to these preferences since interaction is limited and directed mainly to an instructor.

A comparison of the Thinking and Feeling types also indicate some significant differences. Table 15 shows that Thinking types indicated a greater preference for sitting in rows or a semi-circle, while Feeling types prefer to sit in a circle. One might expect that one manner of optimizing a Feeling type's interest in people and preference for personal rapport (Myers, 1980: 200-201) would be through a circle configuration. Thinking types, on the other hand, may be best accommodated through the row configuration. This could be explained by their interest in ideas and things as well as their logical approach to life (Lawrence, 1982: 74). The Thinking types' interest in the non-personal aspects of the classroom environment may result in the preference which reflects the configuration to which they are most accustomed - the row configuration.

Table 15

Level of Significance Between MBTI Dichotomous Types: Classroom Configuration Preference

Set compared	Who Preferred	Arrangement Preferred	Significance
E to I	E	Circle	***
	I	Semi-circle	***
		Rows	***
S to N	S	Semi-circle	***
		Rows	***
	N	Circle	***
T to F	T	Semi-circle	***
		Rows	***
	F	Circle	***
J to P	J	Rows	***
	P	Semi-circle	***

Level of significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

Within the analysis of the cognitive sets, total NF responses indicate a higher preference than the expected value for the semi-circle or circle configuration. There were no significant preferences for the differentiated NFs. The ST and differentiated ST responses show a higher than expected preference for the semi-circle and row classroom arrangement. The NT and differentiated NT cognitive sets showed a classroom preference for the semi-circle. The SF type has a higher than expected value preference for the semi-circle in total, but differentiated SFs show no significant preference. Table 16 summarizes the difference between the dichotomous cognitive sets.

Table 16

Level of Significance Between Cognitive Sets: Preferred Classroom Arrangement Preference

Set compared	Who Preferred	Arrangement Preferred	Significance
Total NF to ST	NF	Circle	***
N= NF: 65	ST	Semi-circle	***
ST: 377		Rows	***
Differentiated NF to ST	ST	Semi-circle	***
N= NF: 31		Rows	***
ST: 295			
Total NT to SF	NT	Semi-circle	***
N= NT: 201			
SF: 52			
Differentiated NT to SF	NT	Semi-circle	*
N= NT: 107			
SF: 26			

Level of significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

The significant differences occurred between the dichotomous set of NF and ST. The NF cognitive types, which are characterized by their ability to communicate, indicated a stronger preference for the circle configuration than did the ST cognitive types. One would anticipate that a circle arrangement would enhance the communication opportunities between students, and would, therefore, have a greater appeal for the NF cognitive types.

Sensing-Thinking types chose rows as a higher than expected preference for classroom configuration. One might anticipate that the ST characteristics of being practical and matter-of-fact would result in a preference for a no frills, instructor-centered classroom. These attributes would most often be attributed to a row configuration. One might even go so far as to interpret the ST cognitive types' emphasis on the need for definitions (Hoffman and Betkouski, 1981: 23) as a desire for underlying structure in everything that they do. In turn, this need for structure could be translated into a preference for the row configuration. In addition, ST types may prefer rows since rows tend to be the standard classroom configuration. They may not see a need for or may be uncomfortable in non-standard configurations. Either of these may be acceptable reasons for rejecting any configuration which varies from the standard.

"Where do you prefer to sit?" This question was asked only of people who responded higher than expected that they prefer to sit in a semi-circle or in rows. There were two dominant answers to this question throughout the MBTI groups. These responses were preferences for a classroom seating were the rear of the room and to the left. There were several types that had no significantly different seating preferences than what was expected.

Complete analysis for this question is found in Appendix B.1.b. Responses between MBTI types are summarized in Table 17, which shows the preferred arrangement and seating location. This table shows the dominating dichotomous letter type response for each response. Note that each letter type had students who responded to a preference for rows or a semi-circle, and therefore there were some in each group who responded to the seating preference question. the subsample for this question was restricted to those who responded that they preferred to sit in rows or a semi-circle.

Table 17

Level of Significance Between MBTI Single Letter Types: Preferred Classroom Arrangement and Seating Preferences

Preferred Class Arrangement	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
Row	----	***	***	----	***	----	***	----
Semi-Circle	----	***	***	----	***	----	***	----
Circle	***	----	----	***	----	***	----	----
Group Clusters	----	----	----	----	----	----	----	----
Scattered	----	----	----	----	----	----	----	----
Preferred Seating In Row or Semi-Circle								
	N=200	N=328	N=345	N=182	N=450	N=77	N=345	N=182
Left	----	***	----	***	***	----	***	----
Center	----	----	----	----	----	----	----	----
Right	----	----	----	----	----	----	----	----
Front	----	----	----	----	----	----	----	----
Center	----	----	----	----	----	----	----	----
Rear	----	***	***	----	***	----	----	***

Introverts responded to a preference to seating in the rear of the classroom to a greater degree than did Extraverts. Since Introverts prefer to work alone (McCaulley, 1980: 17) and tend to hold back from new experiences (Lawrence, 1982: 71), one might conclude that Introverts sit in the rear and side of the classroom in order to detach themselves from the other students.

In reviewing the responses of the Perceiving types, there is a higher observed value then what was expected for sitting in the rear of the classroom. By recalling the Perceiving types characteristics of aiming to miss nothing and desiring autonomy

(Lawrence, 1982: 77), one might conclude that sitting in the rear of the classroom might support these preferences. By selecting seats in the rear of the classroom the rear of the classroom Perceiving types can view everything that occurs - interactions between the instructor and students as well as between the students. In addition, the location at the rear of the classroom my provide the a feeling of independence from the instructor since instructors are located at the front of the classroom.

Results for the cognitive sets are found in Appendix B.2.b. Higher observed values than expected were found for two cognitive sets. The ST cognitive types preferred to sit in the rear of the classroom, and the NT cognitive types preferred to sit on the left side of the classroom. With the common type in these two sets being the Thinking type, the reader is reminded that the Thinking types reported higher than expected frequencies for both the left and rear of the classroom (see Table 17). When reviewing the results for the Sensing types, the only location that had a higher than expected frequency was the rear of the classroom. In contrast, the Intuitive types reported a higher than expected frequency for only the left of the classroom. Thus it appear that the preferred location was the result of the irrational types (Sensing/Intuitive). In the NF and SF cognitive sets there were no observed values that were higher than the expected. It appears that even though the Sensing/Intuitive types may have contributed to the preferences identified in the NT and ST cognitive sets, the combination with Feeling (as opposed to Thinking) aspect does not yield the same results. It may be possible that the Feeling influence results in these people feeling comfortable anywhere the sit, or that they sit wherever there friends sit. As a result, they have no specific preference.

"Which classroom arrangement has been used MOST during your classes?" For all types and cognitive sets, there was a one overwhelming response to this question. Each type and set responded that the classroom configuration most frequently encountered was rows (see Appendices B.1.c and B.2.c). For comparison purposes,

Table 18 summarizes the frequency count and percentage preference all configurations for the entire sample. Note that the preferred order of configuration, based on the percentages, is semi-circles, rows, circle, group clusters, and scattered. The largest percentage of students preferred the semi-circle configuration even though the row was indicated as the most frequent configuration encountered. These results will be addressed further in Chapter 5, Conclusions.

Table 18

Total Sample: Preferred Classroom Configuration

N=690	Rows	Semi-circle	Circle	Group Clusters	Scattered
Frequency	228	299	141	12	10
Percentage	33%	43%	20%	2%	1%

Investigative Question 3

What is the relationship between psychological type and subject matter difficulty as perceived by the student?

There were two, multi-part measurement questions asked in the Education Style Survey that assist in answering this investigative question. These measurement questions asked each student to list their top five most difficult courses/subjects and their top five least difficult courses.

The investigative question is answered by using the chi-square analysis procedure in four steps for each measurement question, similar to the process described in the second investigative question.

Analysis.

"Which courses/subjects were MOST difficult?" There were sixteen possible choices that could be selected for this question. The sixteen course selections included:

Acquisition	Behavioral	Contracting
Economics	Engineering	Supply
Transportation		Maintenance
Research Methods	Accounting/Finance	Computer Programming
Quantitative Decision Making	Logistics Management	Professional Writing
	Cost Analysis	

Students were asked to provide their top five responses to courses they found most difficult.

The total responses from each type were tested, and the top five responses were determined for each MBTI category. (Figure 5). The complete analysis for these tests are at Appendix C.1.a.

Ho: $p_1 = p_2 = p_3 = \ldots = p_k = 5/k$ (No preference)

Where p_1 is the proportion of group members who selected a choice as one of the top five choices.

Ha: At least one of the probabilities exceeds 5/k.

Test Statistic: $\chi^2 = \sum_{i=1} [n_i - E(n)_i]^2 / E(n)_i + [(n - n_i) - (n - E(n)_i)]^2 / (n - E(n)_i)$

Where n_i = the number of group members who selected a choice in their top five responses. $E(n)_i = 5/k$, the expected number of group members to select a choice if Ho is true. The total number of the group members equals n.

Critical χ^2 values for k-1 degrees of freedom are listed in the appropriate appendix for each question.

χ^2 Test statistic values are listed in appropriate appendix for each question.

Figure 5. Analysis Procedure for Chi-Square Analysis for Top Five Choices

Analysis on cognitive sets was accomplished using the same technique discussed in Figure 5 and Figure 4. The complete analysis for these tests are at Appendix C.2.a.

"Which courses/subjects were LEAST difficult?" There were sixteen possible choices that could be selected for this question. The sixteen course selections included:

Acquisition	Behavioral	Contracting
Economics	Engineering	Supply
Transportation	Statistics	Maintenance
Research Methods	Accounting/Finance	Computer
Quantitative Decision	Logistics Management	Programming
Making	Cost Analysis	Professional Writing

Students were asked to provide their top five responses to courses they found least difficult.

The same four step procedure was accomplished for the least difficult courses. Chi-square statistical values and conclusions for this question for the MBTI types' top five single letter and cognitive sets responses are found in Appendices C.1.b and C.2.b.

Results

"What are your top five MOST difficult classes?" There were five dominant answers to this question throughout the MBTI groups. These responses were Economics, Statistics, Quantitative Decision Making, Computer Programming and Accounting/Finance.

The top five most difficult courses for MBTI single letters included Economics, Statistics, Accounting/Finance, Computer Programming, and Quantitative Decision Making. Each single letter type found Economics, Statistics and Quantitative Decision Making to be in their top five list of most difficult courses to a greater degree than the expected distribution. The responses of Accounting/Finance and Computer Programming varied among the single letter types. A complete set of results, including differentiated and undifferentiated results, is contained in Appendix C.1.a. Table 19 summarizes the results for each MBTI category.

Table 19

Level of Significance for MBTI Single Letter Types: Top Five Most Difficult Courses

Course	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
Economics	***	***	***	***	***	***	***	***
Statistics	***	***	***	***	***	***	***	***
Accounting/Finance	**	***	***	*	***	----	***	**
Computer Programming	----	***	**	**	***	**	***	----
Quantitative Decision	***	***	***	***	***	***	***	***

Level of Significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

Note that each student was able to choose 5 classes. In order to accommodate this, multiply N by 5.

Each of the single letter types as well as the undifferentiated and differentiated subcategories selected these classes as the top five most difficult. Because the entire sample indicated that these classes were the most difficult, an analysis of the strength of the preferences between the dichotomous types was accomplished. Thinking types reported a stronger response than did Feeling types that the five classes were difficult. Since all five classes are of an objective and quantitative nature, the characteristics of a Thinking types may aid in explaining these results. As previously described, Thinking types tend to take the solution of objective problems seriously and they exhibit endurance (Lawrence, 1982: 8, 74-75). This may result in Thinking types expending more time and energy in preparing for these classes which, in turn, may have resulted in these classes being identified as more difficult. In contrast, Feeling types may place more emphasis on the relationships developed in class. Thus, a student's determination of course difficulty may have been influenced by personal relationships.

Judging types responded at a stronger rate than did Perceiving types to the same classes. The data indicate that the Judging types consistently identified the same classes as being the most difficult, while the Perceiving types identified a greater variety of courses as being most difficult. As a result, the Judging types exhibited a greater strength in their preferences. The consistency among the Judging types may be due to the nature of the classes which required a great deal of reading couple with numerous homework assignments. Due to the Judging types' preference for decisiveness and desire to thoroughly understand the material ("aim to be right") (Lawrence, 1982: 76), the Judging types may have spent more time in completing the assigned workload. As a result, the classes were perceived as being more difficult. In contrast, the Perceiving types identified a greater variety of courses as being more difficult. This lead to a weaker preference for those which were the top five most difficult. The overall difficulty experienced by the Perceiving types may have resulted from constraints imposed through course syllabi. For example, the syllabi establish a set time schedule for completing assignments. This conflicts with the Perceiving types' characteristic of considering time a hindrance and limits their spontaneity and flexibility (Lawrence, 1982: 77; Schurr and Ruble, 1986: 35). Therefore, a greater variety of classes may have been identified as being more difficult. Because the Perceiving types were not as consistent in their responses, and the Judging types were, the Judging types' responses were stronger.

Within the cognitive sets, total NF responses indicate a higher than expected frequency for Statistics, Economics and Quantitative Decision Making as most difficult courses. ST sets found Statistics, Economics, Quantitative Decision Making and Accounting/Finance as difficult classes. NT found Statistics, Economics, Accounting/Finance to be difficult classes (observed frequency higher than expected) and SF only responded that Economics was a difficult class (observed frequency higher than expected). In comparing the strengths of the responses between the dichotomous cognitive sets, it appears that those cognitive sets with Thinking types reported significant preferences over those sets with Feeling types, as was the case in the single letter MBTI preferences. (A complete set of responses for each cognitive sets' top five most difficult courses is in Appendix C.2.a.) A summary of the preferences between the dichotomous cognitive sets is found in Table 20.

Table 20

Level of Significance Between Cognitive Sets: Most Difficult Courses

Set compared	Who Preferred	Difficult Classes	Significance
Total NF to ST	ST	Statistics	***
N= NF: 67		Economics	***
ST: 377		Quantitative Decision Mkg	***
		Accounting/Finance	**
Differentiated NF to ST	ST	Quantitative Decision Mkg	***
N= NF: 31		Economics	***
ST: 295		Statistics	**
Total NT to SF	NT	Statistics	**
N= NT: 201		Economics	*
SF: 52			
Differentiated NT to SF	(No significant differences from expected)		
N= NT: 107			
SF: 26			

Level of significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

"What are your top five LEAST difficult classes?" There were four dominant answers to this question throughout the MBTI groups. These responses were for Behavioral, Research Methods, Acquisition, and Professional Writing courses. The fifth class generally was Contracting; however, this was never a choice that was chosen more than expected to a level of significance of at least .05.

The results for top five least difficult courses for MBTI single letters reported that each type chose the Behavioral type class as one of the least difficult (observed higher than expected). Research Methods and Professional Writing were also higher than expected responses for all letter types except Feeling types. Extraverts, Sensing, Thinking and Judging types, to varying degrees, chose Acquisition as another of the top five least difficult courses. A complete set of results is contained in Appendix C.1.b.

Table 21 summarizes the results for top five least difficult courses for MBTI single letter types.

Table 21

Level of Significance for MBTI Single Letter Types: Least Difficult Courses

Course	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
Acquisition	**	----	**	----	**	----	*	----
Behavioral	***	***	***	***	***	***	***	***
Contracting	----	----	----	----	----	----	----	----
Research Methods	**	***	***	**	***	----	***	----
Professional Writing	**	***	*	***	***	----	*	*

Level of Significance	Symbol
p < .05	*
p < .01	**
p < .001	***

In looking at the least difficult classes, Introverts favored classes focusing on writing to a greater degree than did Extraverts. Because classes such as Professional Writing and Research Methods focused on writing skills, one would expect them to be a preference of Introverts since they prefer written assignments (Lawrence, 1982: 70-71).

Intuitors, when asked to identify their least difficult classes, picked Behavioral and Professional Writing classes more than was expected. These classes emphasize the ability to understand and apply concepts as well as incorporate ideas in clear and concise written assignments. As a result, these classes favor those who have the capacity to work with abstraction, symbols, and theory - which are all characteristics of Intuitive types (Lawrence, 1982: 73; Myers and McCaulley, 1985: 95; Schurr and Ruble, 1986: 25).

Judging types found Acquisition, Behavioral, Research Methods and Professional Writing classes as least difficult to a stronger degree than Perceiving types. These classes involve numerous of written assignments that require the ability to organize ideas as well as organizing one's time so as to complete the assignments on schedule. As previously stated, Judging types have a preference for being organized and planning their time (Provost, 1985: 20), and prefer structured tasks and established goals as well as considering time a resource (Lawrence, 1982: 76). In contrast, Perceiving types consider time a hindrance since they tend to be more spontaneous and flexible (Lawrence, 1982: 77; Schurr and Ruble, 1986: 35). Based on these characteristics of Judging and Perceiving types, one might expect that Judging types would favor the identified classes as being least difficult.

In each set of dichotomous sets, the group of undifferentiated types exhibited higher than the expected values for a number of classes when comparing them to the differentiated types. One might conclude that the undifferentiated types, which have developed aspects of the nonpreferences, are better at adapting to course requirements by employing characteristics of their nonpreference(s). As a result, they may have found more courses to be "least difficult" than did the differentiated types.

In analyzing the results of the cognitive sets, total NF responses indicate a higher than expected response for Behavioral classes as being least difficult courses. Because these types are characterized as being insightful students who prefer creative challenges (Myers and Myers, 1980: 6-7), one might expect that Behavioral classes would provide an avenue for NF cognitive types to focus their strengths. The ST cognitive sets selected Research Methods, Behavioral, Acquisition and Professional Writing classes as being least difficult at a higher rate than was expected. The ability of the ST types to make decisions using logical reasoning processes and impersonal analysis (Myers and Myers, 1980: 7) may provide the necessary focus required of these courses. NT cognitive types found

Behavioral, Professional Writing and Research Methods courses to be least difficult. The NT types are also characterized by logical reasoning processes and impersonal analysis (Myers and Myers, 1980: 6-7) which may lead to these classes being selected as the least difficult. In comparing the NT and SF strengths of preferences, the SF types did not have any courses for which the observed frequency was higher than expected in this area.

A complete set of responses for each cognitive set top five least difficult courses are in Appendix C.2.b.

Investigative Question 4

What is the relationship between a student's psychological type and study strategy?

There were four measurement questions (two multi-part and two single response questions) asked in the Education Style Survey that assist in answering this investigative question. The first two questions asked each student to identify the top five courses/subjects in which they used study groups as well as the amount of students in these top five groups. The third and fourth measurement questions asked the student to describe study objectives for courses they disliked and liked.

The investigative question is answered by using the chi-square analysis procedure in four steps for each measurement question, similar to the process described in the previous investigative questions.

Analysis.

"Which courses/subjects did you most use study groups?" There were sixteen possible choices that could be selected for this question. The sixteen courses from which the student could make selections regarding the courses/subjects in which study were used are:

Acquisition	Behavioral	Contracting
Economics	Engineering	Supply
Transportation	Statistics	Maintenance
Research Methods	Accounting/Finance	Computer Programming
Quantitative Decision Making	Logistics Management	Professional Writing
	Cost Analysis	

Students were asked to provide their top five responses courses for which they used study groups.

Each Myers-Briggs single letter type was tested to determine if there were higher than expected responses to the top five study group course responses within these types (Figure 5). The second step was to determine if significant differences existed between MBTI dichotomous types (observed versus expected). The complete analysis for these tests are at Appendix D.1.a.

The third step was to determine higher than expected responses from each of the four cognitive sets. The final step was to determine if significant differences (observed versus expected) existed between cognitive set dichotomous types. The analysis for these tests are at Appendix D.2.a.

"How many others were in study groups?" Students were asked to provide the number of other students, excluding themselves, used in the study groups they identified in the previous question. The same four step procedure was accomplished for the number in study groups. Chi-square statistical values and results for this question are found in Appendices D.1.b. and D.2.b.

"When confronted with learning a subject you DISLIKED, which learning objective did you set for yourself?" and *"When confronted with learning a subject you LIKED, which learning objective did you set for yourself?"* Possible responses to these questions included: "Master the subject", "Gain a general understanding", or "Learn only enough to pass the test or course." Students were asked to select only one of these choices.

The four step procedure outlined in investigative question 2 was used to determine higher than expected frequencies for the questions of study objectives for classes that students disliked and liked. Details on the responses for these questions are found in Appendices D.1.c., D.1.d., D.2.c. and D.2.d.

Results.

"For which courses/subjects did you most use study groups?" The only course that reported a higher than expected value across all of the single letter MBTI types was that of Statistics. The only other response that had a frequency count that was higher than the expected value was the one that indicated no study groups were used. This information is summarized in Table 22.

Table 22

Percent Who Did and Did Not Use Study Groups.

	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
Did Not Use Study Groups	23%	31%	28%	27%	29%	24%	29%	25%
Used Study Groups	77%	69%	72%	73%	71%	76%	71%	75%

In comparing the responses of the Introverts to the Extraverts, the Introverts used study group the least and Extraverts used study groups the most. One might expect these results since Introverts prefer to work alone and Extraverts prefer group activities (Lawrence, 1982: 70-71; McCaulley, 1980: 17). When comparing the strength of the preferences, Introverts did not use study groups to a stronger degree than Extraverts.

In the area of Thinking/Feeling types, Thinking types were less likely to use study groups than Feeling types. Because Thinking types are more skilled in applying logical analysis as well as exhibiting endurance, it may be possible that Thinking types never experienced a need for others' input in understanding the material presented. For the Feeling types, their characteristics which involve establishing personal rapport and being interested in people may have prompted them to join or form study groups as a way to acquire and maintain friendships (Lawrence, 1982: 8,74-75). Based on these characteristics, one could explain the greater use of study groups by Feeling types than by Thinking types.

For those students who did use study groups, the three classes that were identified as having higher than expected values were also identified as most difficult courses for all types. Extraverted, Intuitive and Thinking types were the only ones who showed a preference to use study groups for Economics. All types except Feeling and Perceiving types used study groups for computer programming. For Quantitative Decision Making and Statistics, all types showed a preference for study groups. Table 23 shows the results for single letter MBTI types for classes in which study groups were most used and Table 24 the results for cognitive sets. This analysis was performed on the sub-group of students who used study groups. Detailed results are provided in Appendix D.1.a.

Table 23

Level of Significance for MBTI Single Letter Types: Courses That Used Study Groups

	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
Course								
Statistics	***	***	***	***	***	***	***	***
Quant Dec Mkg	***	***	***	***	***	***	***	***
Computer Prog	***	***	***	***	***	---	***	---
Economics	**	---	---	*	***	---	---	---

Level of Significance	Symbol
p < .05	*
p < .01	**
p < .001	***

Between cognitive sets, ST types used study groups for classes to a higher degree more than NF types. As ST types are characterized as being practical (Myers and Myers, 1980: 5-7), one could reason that they would find study groups practical for those classes they found difficult.

Table 24

Level of Significance for Cognitive Sets: Courses That Used Study Groups

Course	ST N=377	SF N=52	NT N=201	NF N=65
Single Responses				
Quantitative Decision	***	----	***	*
Statistics	***	***	***	***
Computer Program	***	----	**	----
Between Groups				
Quantitative Decision	**	----	----	----
Statistics	***	----	***	----

Level of Significance	Symbol
p < .05	*
p < .01	**
p < .001	***

"How many others were in study groups?" Total responses ranged from 0 to over 20 in a study group. Summary Statistics for this question are found in Table 25.

Table 25

MBTI Single Letter Types: Summary Statistics for Number in Study Group

	E	I	S	N	T	F	J	P
Mode Total	0	0	0	0	0	0	0	0
Mode for Those Who Used Groups	3	3	3	3	3	3	3	3
Median	2 to 3	1 to 2	2 to 3	1 to 2	1 to 2	2 to 3	1 to 2	3 to 4

One response that occurred at a higher than expected frequency was that study groups were not used, therefore, the number of people in the group was zero. When study groups were used, the higher than expected responses was for 1 to 5 others in the group. For each single letter type, the numbers that occurred at higher frequencies than were expected were for 0, 2, 3, or 4 other people were in the study groups. In addition, Intuitive and Thinking types also selected "*1 other person*" at a higher rate than was expected, and Extraverts and Judging types chose "*5 other people*" at a higher frequency than was expected.

The results of the analysis conducted between the dichotomous types is summarized in Table 26. These findings are for the sub-group of students who replied that they do use study groups. Detailed results are in Appendix D.1.b.

Table 26

Level of Significance Between MBTI Single Letter Types : Number in Study Groups

Number of others in Group	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
1	----	----	----	***	----	----	----	----
2	----	***	***	----	***	----	***	----
3	----	***	***	----	***	----	***	----
4	***	----	***	----	***	----	***	----
5	***	----	----	----	***	----	***	----

Level of Significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

The summary Statistics and results between types show that Extraverts tend to have more people in their study groups than do Introverts. Given that Extraverts prefer group activities while Introverts prefer to work alone (Lawrence, 1982: 70-71, McCaulley, 1976: 2; McCaulley, 1980: 17).

In addressing the findings for the comparison between Thinking and Feeling types, the Thinking types have higher than expected frequencies for using groups with 2-5 other people, while the Feeling types did not experience any numbers at higher than the expected frequencies. If may be possible that the Feeling types were comfortable in any size group which resulted in no specific number occurring at a higher than expected frequency. A similar result occurred for the Judging and Perceiving types. The Judging types reported a greater strength for groups with 2-5 other people, while the Perceiving types did not. These results may be explained by the Perceiving types preference for autonomy and independent study which kept them from involving themselves in study groups.

Table 27 summarizes the courses for which study groups were used and the number of people in these groups. These data are identified by the single letter MBTI types.

Table 27

Summary of Study Group Preferences

Course	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
Quantitative Decision	**	***	***	***	***	***	***	**
Statistics	***	***	***	***	***	***	***	***
Economics	**	----	----	*	***	----	----	----
Computer Programming	***	***	***	----	***	----	***	----
Number of others in Group	E	I	S	N	T	F	J	P
1	----	***	***	***	----	----	----	----
2	***	***	***	***	***	***	***	***
3	***	***	***	***	***	***	***	***
4	***	***	***	***	***	***	***	***
5	***	***	----	----	***	----	***	----

Level of Significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

In analyzing the findings of the cognitive sets, Table 28 summarizes the results for each individual sets as well as presenting the results of the analysis between the dichotomous sets. As indicated, all four cognitive sets used study groups of various sizes. However, when comparing the strength of the preferences, only the ST and NT types exhibited preferences at higher than expected values. The common type between these two sets is the Thinking type. In comparing these results to the results between the Thinking/Feeling dichotomous set, one notes the similarity (see Table 27). As previously stated, this may be due to the Feeling types being comfortable in any size group, so no specific number occurred at higher than expected frequencies.

Table 28

Level of Significance for Cognitive Sets: Number of Others In Study Groups

Number	ST N=377	SF N=52	NF N=201	NT N=65
Single Responses				
1	***	----	----	***
2	***	----	***	***
3	***	***	***	***
4	***	***	***	***
5	*	----	----	----
Between Groups				
2	***	----	----	*
3	***	----	----	**
4	***	----	----	----

"When confronted with learning a subject you DISLIKED, which learning objective did you set for yourself?" and *"When confronted with learning a subject you LIKED, which learning objective did you set for yourself?"* Within the analysis of the individual single letter MBTI types and dichotomous sets(see Table 29 and Appendices D.1.c. & D.1.d), there are results which are not explainable through the student characteristics presented in Chapter 2. The single letter MBTI types all experienced higher than expected frequencies for the responses of "*gain a general understanding*" in courses disliked and "*master the subject*" for courses liked. When asked about the learning objective for courses they disliked, Introverts, Sensing, Feeling, and Perceiving types also reported higher than expected frequencies for the goal of "*learn only enough to pass...*", and "*gain a general understanding*" for courses they liked.

When compared between the dichotomous sets, Extraverts reported higher than expected frequencies for "*gain a general understanding*" for courses disliked, while Introverts reported higher than expected frequencies for the other three responses. The Extraverts' need for dominance (McCaulley, 1980: 17) may have influenced the need to gain an understanding in disliked classes, while the Introverts' desire for achievement may have resulted in the higher than expected frequencies for the other responses.

For the Sensing/Intuitive scale, the Sensing types exhibited higher than expected frequencies for all of the responses when compared to the Intuitive types. This may be attributed to Sensing types' characteristics of being good at tasks that call for carefulness, thoroughness and soundness of understanding, while Intuitive types are good at tasks that call for quickness of insight and in seeing relationships.

Thinking types reported higher than expected frequencies for "*gain a general understanding*" for classes disliked while Feeling types reported wanting to "*learn only enough to pass...*". In addition, for courses liked, Thinking types reported higher than expected frequencies for "*master the subject*" while Feeling types were stronger in their preference to "*gain a general understanding.*". These results may be due to the Thinking types' penchant for endurance in contrast to the Feeling types' emphasis on personal relationships (Lawrence, 1982: 8, 74-75). One might expect that Thinking types would be more tenacious in their studies than Feeling types who tend to place greater priority on developing a good rapport with other students.

The analysis of the Judging and Perceiving types resulted in the same higher than expected frequencies as found in the Thinking and Feeling types. The Judging types may have experienced higher than expected frequencies for "*gain a general understanding*" in disliked courses and "*master the subject*" for like courses due to their preference for being self-regimented, steady, and right (Lawrence, 1982:76), as well as their ability to focus their energies to required tasks (Myers and McCaulley, 1985: 95 and 102). On the other hand, the Perceiving types' need for spontaneity and flexibility (Lawrence, 1982: 77; and Schurr and Ruble, 1986: 35) may have resulted in them setting lower goals than the Judging types.

Table 29

Level of Significance for MBTI Single Letter Types: Objectives for Courses Disliked/Liked

	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
Single Responses								
Objectives for Disliked								
Gain an Understanding	***	***	***	***	***	***	***	***
Enough to Pass	----	**	**	----	----	*	----	**
Objectives for Liked								
Master Subject	***	***	***	***	***	***	***	***
Gain an Understanding	----	*	*	----	----	*	----	*
Between Responses								
Objectives for Disliked								
Gain an Understanding	***	----	***	----	***	----	***	----
Enough to Pass	----	***	***	----	----	***	----	***
Objectives for Liked								
Master Subject	----	***	***	----	***	----	***	----
Gain an Understanding	----	***	***	----	----	***	----	***

Level of Significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

For the responses of the cognitive sets, the impact of the stronger Thinker responses over Feeler responses is evident. However, in this analysis the results do not always reflect the findings of the single letter MBTI types. Overall, the ST and NT types showed higher goals as compared to NF and SF types. These results might be the result of the Thinking types' preference for endurance (Lawrence, 1982: 74). The results are summarized in Table 30.

Table 30

Level of Significance for Cognitive Sets: Objectives for Courses Disliked/Liked

	ST N=377	SF N=52	NF N=201	NT N=65
Single Responses				
Objectives for Disliked				
Gain an Understanding	***	**	***	***
Enough to Pass	**	----	----	----
Objectives for Liked				
Master Subject	***	**	***	***
Gain an Understanding	----	*	----	----
Between Responses				
Objectives for Disliked				
Gain an Understanding	***	----	----	***
Enough to Pass	***	----	----	----
Objectives for Liked				
Master Subject	***	----	----	***
Gain an Understanding	----	**	----	----

Level of Significance	Symbol
p < .05	*
p < .01	**
p < .001	***

Investigative Question 5

What are the relationships between psychological type and one's preference for testing methods?

There were three measurement questions asked in the Education Style Survey that assisted in answering this investigative question. These measurement questions asked the student to select the type of exam they prefer, the type of exam question preferred and the type of question stem preferred.

The investigative question is answered by using the chi-square analysis procedure in four steps for each measurement question, using the same process described in the previous investigative questions.

Analysis.

"Which type of exam do you prefer?" There were three possible responses to this question. These responses included: *"Objective"*, *"Subjective"*, or *"No preference."* Students were asked to select only one of these choices. The MBTI dichotomous types were tested using chi-square analysis as in Figures 3 and 4 (see pages 44 and 45). The complete analysis for these tests is in Appendix E.1.a.

Analysis on cognitive sets was accomplished using the same technique discussed in Figures 3 and 4. The complete analysis and results are shown in Appendix E.2.a.

"What type of questions do you prefer?" There were four possible responses to this question. These were: *"Oral"*, *"Written"*, *"Performance"*, and *"No preference."* Students were asked to select only one of these choices. The same four step procedure was accomplished for the type of test questions preferred. Chi-square statistical analysis and results for this question for the single letter MBTI types and cognitive sets are found in Appendices E.1.b. and E.2.b.

"What type of question stem do you prefer?" Students were asked to provide one response to their preferred question stem, assuming they were asked a test question about the sun. Possible choices for this question included:

"The sun rises in the East. True or False."

"Discuss the benefits to mankind because the sun rises in the East."

"Picture in you mind the sun rising in the East. Describe your impressions and feelings."

"Why does the sun rise in the East?"

The four step procedure was accomplished for the type of test questions preferred. Chi-square statistical analysis and results for this question for single letter MBTI types and cognitive sets are found in Appendices E.1.c. and E.2.c.

Results.

"Which type of exam do you prefer?" For each MBTI single letter choice and cognitive set, the higher than expected response to this question was a preference for objective exams (versus subjective or no preference). Between types, stronger responses were found in Introverts, Sensing, Thinking, and Judging types. Results of the undifferentiated groups as compared to their respective differentiated dichotomous sets are shown in Table 31. Between cognitive sets, NT and ST had stronger responses as compared to SF and NF. The analysis for this question can be found in Appendices E.1.a. and E.2.a.

Table 31

Level of Significance Between MBTI Undifferentiated and Differentiated Single Letter Types: Exam Preferences

	E	I	S	N	T	F	J	P
Undifferentiated	N=283	N=412	N=429	N=266	N=578	N=117	N=445	N=250
Objective	***	----	----	***	----	----	----	***
Differentiated	N=240	N=261	N=355	N=197	N=494	N=70	N=317	N=170
Objective	----	***	***	----	***	***	***	----

Level of Significance	Symbol
p < .05	*
p < .01	**
p < .001	***

"Which type of test question do you prefer?" For each MBTI single letter choice and cognitive set, the response that exhibited higher observed values than expected was that for written test questions (versus oral, performance or no preference). Between types, strong responses were found in Introverts, Sensing, Thinking, and Judging types. Again between cognitive sets, the NT and ST cognitive sets had stronger (observed frequency greater than expected frequency) responses as compared to SF and NF (Appendices E.1.b. and E.2.b.).

"Which type of question stem do you prefer?" The responses to this question that occurred at higher than expected frequencies were *"The sun rises in the East. True/false"* or *"Why does the sun rise in the East?"* Results are summarized in Table 32 and are detailed in Appendix E.1.c.

Table 32

Level of Significance for MBTI Single Letter Types: Preferred Question Stems

	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
Single Responses								
True/False	***	***	***	----	***	----	***	***
Why...	***	***	***	***	***	***	***	***
Between Responses								
True/False	----	***	***	----	***	----	***	----
Why...	***	***	***	----	----	***	----	----

Level of Significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

When analyzing between types, Intuitive types had a preference for the question stem "*Why does the sun rise in the East*?" while Sensing types had a preference for true/false question stems. Recalling that Intuitive types prefer to work with concepts instead of details and are good at tasks that call for insight and in seeing relationships, one can understand why this question stem was selected at higher than expected frequencies. The response is a preference for the type of question that allows them to use their writing skills preparing a response that applies concepts. In contrast, the Sensing types' preference for facts and details may have resulted in the selection of the most direct question stem (Lawrence, 1982: 7, 72-73; Myers and Myers, 1980: 155, 200.

This analysis appears relevant to the analysis of the cognitive types. For cognitive sets, Table 33 summarizes the findings. The ST types preferred (observed higher than expected) both responses over the NF types. Because the ST cognitive types are practical

(Myers and Myers, 1980: 7) and emphasize the need for definitions (Hoffman and Betkouski, 1981: 23), one might expect that they would have a stronger preference for true/false questions or questions which ask for an explanation. The NF types did not have a stronger preference for either stem. This may have resulted, as a group, because they chose each response at a relatively equal rate. Because these students are insightful and prefer creative challenges (Kroeger and Thuesen, 1988: 54), it is possible that the NF students were able to see the creative challenge to each question and, therefore, their responses provided a variety of answers.

Between the NT and SF types, the NT types exhibited a stronger preference for the question "Why does the sun rise in the East?", while the SF types had no stronger preference. Given the description of the NT types who prefer to work with concepts, one can understand why they indicated a stronger preference for this question stem than did the SF types.

Table 33

Level of Significance for Cognitive Sets: Preferred Question Stems

	ST	SF	NF	NT
	N=377	N=52	N=201	N=65
Single Responses				
True/False	***			
Why...	***			***
Between Responses				
True/False	***			
Why...	***			***

Investigative Question 6

Is there a relationship between psychological type and the amount of interaction of students and faculty?

There are four measurement questions asked in the Education Style Survey that assist in answering the investigative question. These measurement questions asked the student to indicate how often they visited with Course Instructors, Academic Advisors, Option Managers, and Thesis Advisors.

The investigative question is answered by using the chi-square analysis procedure in four steps for each measurement question, similar to the process described in the previous investigative questions.

Analysis.

"How often did you visit your Course Instructor? Academic Advisor? Option Manager? Thesis Advisor?" There were seven possible responses to these questions. The potential choices were: *"Daily"*, *"2-3 times per week"*, *"Once a week"*, *"Once in two weeks"*, *"Once a month"*, *"Once during the course/program"*, or *"Never during the course/program."* The student was asked to choose only one response for each of these questions.

Responses within and between MBTI single letter types were tested using chi-square analysis (Figures 3 and 4 on pages 44 and 45). The complete analysis for these tests are at Appendices F.1.a. (course instructor), F.1.b (academic advisor), F.1.c. (option manager), and F.1.d. (thesis advisor).

Analysis on cognitive sets was accomplished using the same technique discussed in Figures 3 and 4 (see pages 44 and 45). Analysis was performed on the complete sample of cognitive sets and on those who showed a "differentiated" preference for the set. The complete analysis for these tests are at Appendices F.2.a. (course instructor), F.2.b. (academic advisor), F.2.c. (option manager), and F.2.d. (thesis advisor).

Results.

"How often did you visit your Course Instructor? Academic Advisor? Option Manager? Thesis Advisor?" Higher than expected responses to this question are

summarized in Table 34 in which the frequency counts are provided for each letter type, and in Table 35 in which significance between single letter dichotomous types is summarized. The analysis is detailed in Appendices F.1.(a-d).

Table 34

MBTI Single Letter Types: Significant Frequency Counts on Visits to Faculty

	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
Course Instructor								
Once During a Course	113	178	168	123	236	55	178	113
Once a Month	75	95	120	50	149	21	115	55
Academic Advisor								
Once During a Course	95	81	152	84	197	39	152	84
Once a Month	116	98	172	108	230	50	180	100
Option Manager								
Never	81	126	128	79	176	31	130	77
Once During a Course	70	122	125	67	156	36	114	78
Once a Month	72	88	92	68	131	29	108	52
Thesis Advisor								
Once a Week	84	72	120	75	166	29	131	64
Once in Two Weeks	93	78	150	90	197	43	156	84
Once a Month	59	53	91	61	131	21	92	60

Level of Significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

Table 35

Level of Significance Between MBTI Single Letter Types: Visits to Faculty

	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
Course Instructor								
Once During a Course	----	***	***	----	***	----	***	----
Once a Month	***	----	***	----	***	----	***	----
Academic Advisor								
Once During a Course	----	***	***	----	***	----	***	----
Once a Month	----	***	***	----	***	----	***	----
Option Manager								
Never	----	***	***	----	***	----	***	----
Once During a Course	----	***	***	----	***	----	----	***
Once a Month	***		----	***	***	----	***	----
Thesis Advisor								
Once a Week	----	***	***	----	***	----	***	----
Once in Two Weeks	----	***	***	----	***	----	***	----
Once a Month	----	***	***	----	***	----	***	----

Level of Significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

While analyzing the single letter MBTI types, Extraverts and Introverts both visited the faculty to some degree. However, when comparing the strength of the preference between the types, Extraverts visited the faculty more frequently than did Introverts. Because Extraverts have an external focus toward people and Introverts have an internal focus toward ideas and concepts (McCaulley, 1980: 17), one might expect Extraverts would visit the faculty more often than Introverts.

Sensing types tended to visit the faculty more often than did Intuitive types. Because of the Sensing types' need for thoroughness and a sound understanding of a subject (Lawrence, 1982: 7, 72-73), one might expect that they would visit the faculty to gain a better understand of course material or assignments. On the other hand, Intuitive types work conceptually, are good at tasks that call for quickness of insight, and prefer autonomy. This may result in the Intuitive types being able to more quickly grasp and understand a subject without the need to visit with faculty to clarify specific points.

Table 36 summarizes the higher than expected responses between the dichotomous cognitive sets. The detailed results are in Appendices F.2.(a-d). In cases where there was a stronger preference, the Thinking sets exhibited the stronger preferences when compared to the Feeling sets. Because Thinking types prefer to emphasize the academic aspect of the learning environment (logical analysis, facts and ideas), it is possible that their visits to faculty were to address course material. This may explain their stronger preference in visiting the faculty.

Table 36

Level of Significance Between Cognitive Sets: Frequency of Visits to Faculty

	ST N=377	SF N=52	NF N=201	NT N=65
Course Instructor				
Once During a Course	***	----	----	**
Once a Month	***	----	----	----
Academic Advisor				
Once During a Course	***	----	----	*
Once a Month	***	----	----	**
Option Manager				
Never	***	----	----	*
Once During a Course	***	----	----	----
Once a Month	***	----	----	----
Thesis Advisor				
Once a Week	***	----	----	----
Once in Two Weeks	***	----	----	*
Once a Month	***	----	----	----

Level of Significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

Investigative Question 7

What is the relationship between psychological type and one's ability to adapt to academic stress?

There were seven measurement questions asked in the Education Style Survey that assist in answering the investigative question. These measurement questions include feelings about grade point average; if students had considered dropping out of the educational program and why; how many courses were dropped/added during the program; whether preferred learning strategies had changed and why; and when students felt they had become adjusted to the routine of the educational program.

The investigative question is answered by using the chi-square analysis procedure in four steps for each measurement question, similar to the process described in the previous investigative questions.

Analysis.

"How do you feel about your grade point average?" There were four possible responses to this survey question. These responses included: *"Higher than it should be"*, *"About right"*, "Lower than it should be", or *"Not important enough to be a concern."* For each Myers-Briggs single letter type, the following analysis procedure outlined in Figures 3 and 4 (see pages 44 and 45) was used. The complete analysis for these tests are at Appendix G.1.a.

Analysis on cognitive sets was accomplished using the same technique discussed in Figures 3 and 4 (Pages 44 and 45). The complete analysis for these tests are at Appendix G.2.a.

"Have you seriously considered dropping out of your educational program?" The possible response to this question was either *"Yes"* or *"No."* For each

Myers-Briggs single letter type, chi-square analysis was used. The complete analysis for these tests are at Appendix G.1.b.

Analysis on cognitive sets was accomplished using the chi-square analysis. The complete analysis for these tests are at Appendix G.2.b.

"What was the prime reason why you considered dropping out of your program?" Responses for this question only included those students who answered yes, they had considered dropping out, in the previous question. Choices for this question included: "*Academic*", "*Social*", "*Cultural*", "*Family*", "*Professional*", or "*Other.*" For each Myers-Briggs single letter type who replied yes, chi-square analysis was used. The complete analysis for these tests are at Appendix G.1.c.

Analysis on cognitive sets was accomplished using the chi-square analysis. The complete analysis for these tests are at Appendix G.2.c.

"How many classes have you dropped or added during your program?" Students were asked to respond how many courses (quantitative or qualitative) were dropped or added during the program. This question appeared to cause confusion for the students as they responded. Therefore, results are only tabulated as total number of courses dropped and added during the program. For each Myers-Briggs single letter type, chi-square analysis was used. Differences between MBTI dichotomous types were also tested using chi-square analysis. The complete analysis for these tests are at Appendix G.1.d.

Analysis on cognitive sets was accomplished using the chi-square analysis. The complete analysis for these tests are at Appendix G.2.d.

"Do you believe your PREFERRED learning strategies have changed while in your education program?" There were five possible responses that students could choose for this question. These responses include: "*Don't know*", "*Absolutely not*", "*Perhaps*", "*Yes, somewhat*", or "*Yes, a great deal.*" and students were asked to provide

only one response. For each Myers-Briggs single letter type, chi-square analysis was used. Differences between MBTI dichotomous types also were tested using chi-square analysis. The complete analysis for these tests are at Appendix G.1.e.

Analysis on cognitive sets was accomplished using the chi-square analysis. The complete analysis for these tests are at Appendix G.2.e.

"What were the three MOST influential causes for this change?"

Responses for this question only included those students who answered "*Perhaps*", "*Yes, somewhat*", and "*Yes, a great deal*" that they had changed learning strategies. There were twelve possibilities from which students were asked to choose three. These choices include:

Marriage during the program	Divorce just prior to program
Divorce during program	Birth of a child
Gave birth to a child during program	Promotion selection/confirmation
Promotion non-selection	Physical change
Emotional Change	Adaptation to teaching strategies
Influence of other students	Professional focus/interest

For each Myers-Briggs single letter type who replied in one of these three ways, chi-square analysis similar to Figures 3 and 4 (see pages 44 and 45) was used. The complete analysis for these tests are at Appendix G.1.f.

Analysis on cognitive sets was accomplished using the chi-square analysis. The complete analysis for these tests are at Appendix G.2.f.

"During which quarter do you feel you adjusted to the routine of your educational program?" Students were asked to provide one response to the nine possible choices provided in this question. These responses are identified at on the next page.

Responses on adjusting to program routine:

I have yet to adjust	Short term	1st quarter (Summer)
2nd quarter (Fall)	3rd quarter (Winter)	4th quarter (Spring)
5th quarter (Summer)	6th quarter (Fall)	Adjustment was not necessary

For each Myers-Briggs single letter type, chi-square analysis was used. Responses between MBTI dichotomous types were also tested using chi-square analysis. The complete analysis for these tests are at Appendix G.1.g.

Analysis on cognitive sets was accomplished using the chi-square analysis. The complete analysis for these tests are at Appendix G.2.g.

Results.

"How do you feel about your grade point average?" For this question, there were two responses that were stronger than expected for each MBTI type and each cognitive set. These responses were "*About Right*" and "*Lower than it Should Be*." Appendices G.1.a and G.2.a. provide the complete analysis for each letter type and cognitive set. Table 37 shows greater than expected responses for single letter types.

Table 37
Level of Significance for MBTI Single Letter Types: Feelings about GPA

	Each MBTI Single Letter							
	E	I	S	N	T	F	J	P
	N=283	N=412	N=429	N=266	N=578	N=117	N=445	N=250
About right	***	***	***	***	***	***	***	***
Lower than it should be	----	***	***	----	***	----	*	**
	Between MBTI single letter							
	E	I	S	N	T	F	J	P
	N=283	N=412	N=429	N=266	N=578	N=117	N=445	N=250
About right	***	----	***	----	***	----	----	***
Lower than it should be	----	***	***	----	***	----	----	***

Level of Significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

As shown in the Table 37, Extraverts felt that their grade point average was about right more often than Introverts. Introverts, to a greater degree than expected, felt that their grade point average was lower than it should be. In reviewing the characteristics of these types, Extraverts work by trial and error and Introverts desire achievement (McCaulley, 1980: 17). These two characteristics may help explain the significant responses of these types.

Judging types tend to be self-regimented and steady. They aim to be right while Perceivers are flexible and adaptable. One might expect that the nature of these types would cause Judgers to be harder on themselves than Perceivers. The strength of response of a grade point being "*lower than it should be*" did not show this, however. Perceivers have a stronger response of "*lower than it should be*" and "*about right.*" The response of "*about right*" is as anticipated because Perceivers are expected to be more easy going and adaptable in their perception of the outer world.

Between cognitive sets, only the Intuitive-Thinkers (NT) had a significant response of "*about right*" to this question as compared to its dichotomous set. There was no greater than expected value between the replies of the NTs and SFs.

"Have you seriously considered dropping out of your educational program?" The overwhelming response from all MBTI letter types and cognitive sets was that they had never seriously considered dropping out of their educational program. Table 38 summarizes the frequency and percentage of response to this question. A complete set of the analysis and results for this question is in Appendices G.1.b. and G.2.b.

Table 38

Frequency and Percent of Those Who Did Not Consider Dropping the Program

	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
Freq Responding No	265	364	388	241	528	101	411	218
Percent Responding No	94%	88%	90%	91%	91%	86%	92%	87%
Freq Responding Yes	18	48	41	25	50	16	34	32
Percent Responding No	6%	12%	10%	9%	9%	14%	8%	13%

"What was the prime reason why you considered dropping out of your program?" Since so few people responded yes to the previous question, the N for this question is low. Table 38 summarizes the number of yes responses that was the basis for this question. Appendices G.1.c and G.2.c. contain a complete set of analysis and results. Greater than expected responses were "*other*" and came from single letter Sensors and Thinkers and as well as the STs cognitive set.

"How many classes have you dropped or added during your program"? Results from this question ranged from 0 classes dropped during the program to 10 classes dropped. Significant responses were found for of 0 classes dropped or added and 2 classes dropped/added. Most students did not drop or add classes and when they did, most only dropped one and added another. Table 39 provides the frequency count for MBTI letter types. Chi-square results for between letter types is provided in table 40 and complete analysis is contained in Appendix G.1.d.

Note that 49% of Perceiving types did not change classes while only 46% of Judging types did not change classes. Between groups, Perceivers types tend to not drop classes more than Judging types. Perceiving types are flexible and adaptable (Lawrence, 1982: 76-77) so one would expect that they would adapt to their schedules easier than Judging types.

Table 41 summarizes the results for the cognitive sets with regards to the number of courses dropped/added. Appendix G.1.d provides the detailed results.

Table 39

MBTI Single Letter Types: Frequency Count for Number of Courses Dropped/Added

	Frequency count Number of Classes Dropped and/or Added										
	0	1	2	3	4	5	6	7	8	9	10
E (N=283)	132	11	81	8	34	5	7	1	2	1	1
I (N=412)	199	32	115	10	40	3	8	3	0	0	2
S (N=429)	197	26	129	13	45	5	9	3	0	0	2
N (N=266)	134	17	67	5	29	3	6	1	2	1	1
T (N=578)	279	36	161	16	58	8	11	4	2	1	2
F (N=117)	52	7	35	2	16	0	4	0	0	0	1
J (N=445)	207	29	135	8	47	4	7	4	1	0	2
P (N=250)	123	14	61	10	27	4	8	0	1	1	1

Table 40

Level of Significance for MBTI Single Letter Types: Number of Classes Dropped/Added

Classes Dropped/Added	E	I	S	N	T	F	J	P
0		***	***		***			***
2		***	***		***		***	

Level of Significance	Symbol
p < .05	*
p < .01	**
p < .001	***

Table 41

Level of Significance for Cognitive Sets: Number of Classes Dropped/Added

Classes Dropped/Added	ST N=377	SF N=52	NF N=201	NT N=65
0	***	----	----	**
2	***	----	----	----

Level of Significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

"Do you believe your preferred learning strategies have changed...?" For this question, there were greater than expected responses of "*yes somewhat*" and/or "*perhaps*" for all MBTI single letter types except Feelers. For the cognitive sets, STs and NTs replied that "*yes somewhat*" and/or "*perhaps*" their learning strategies had changed. Table 42 summarizes the results of this question. The complete analysis is contained in Appendices G.1.e. and G.2.e.

Table 42

Level of Significance for MBTI Single Letter Types: Changes in Preferred Learning Strategies

	N	Don't Know	Absolutely Not	Perhaps	Yes, Somewhat	Yes, A Great Deal
E	283	----	----	***	***	----
I	412	----	----	***	----	----
S	429	----	----	***	***	----
N	266	----	----	***	*	----
T	578	----	----	***	***	----
F	117	----	----	----	----	----
J	445	----	----	***	***	----
P	250	----	----	***	----	----

Level of Significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

"What were the three most influential causes for your changed learning strategy?" For those students who replied *"perhaps"*; *"yes, somewhat"*; or *"yes, a great deal"* to the previous question, Tables 43 and 44 are provided to show the three most influential reasons for this change. These tables show the frequency counts for all possible choices and greater than expected responses for MBTI single letter type. A complete set of the analysis is contained in Appendix G.1.f.

Table 43

Frequency Count on Top Three Most Influential Reasons for Changed Learning Strategy

	E N=189	I N=243	S N=266	N N=166	T N=362	F N=70	J N=283	P N=149
Marriage During Program	9	7	11	5	14	2	8	8
Divorce Prior to Program	4	2	5	1	5	1	5	1
Divorce During Program	6	6	7	5	9	3	7	5
Birth of a Child	18	29	35	12	40	7	31	16
Gave Birth to a Child	3	1	2	2	3	1	1	3
Promotion Selection	4	8	7	5	11	1	9	3
Promotion Non-selection	1	1	2	0	1	1	1	1
Physical Change	3	13	12	4	13	3	12	4
Emotional Change	50	88	84	54	108	30	92	46
Adaptation to Teaching	155	199	218	136	300	54	228	126
Influence of Other Students	135	164	191	108	246	53	189	110
Professional Focus	137	171	184	124	262	46	204	104

Table 44

Level of Significance for MBTI Single Letter Types: Top 3 Most Influential Reasons for Changed Learning Strategy

	E N=189	I N=243	S N=266	N N=166	T N=362	F N=70	J N=283	P N=149
Marriage During Program	---	---	---	---	---	---	---	---
Divorce Prior to Program	---	---	---	---	---	---	---	---
Divorce During Program	---	---	---	---	---	---	---	---
Birth of a Child	---	---	---	---	---	---	---	---
Gave Birth to a Child	---	---	---	---	---	---	---	---
Promotion Selection	---	---	---	---	---	---	---	---
Promotion Non-selection	---	---	---	---	---	---	---	---
Physical Change	---	---	---	---	---	---	---	---
Emotional Change	---	---	---	---	---	---	---	---
Adaptation to Teaching	***	***	***	***	***	***	***	***
Influence of Other Students	***	***	***	***	***	***	***	***
Professional Focus	***	***	***	***	***	***	***	***

Level of Significance	Symbol
p < .05	*
p < .01	**
p < .001	***

Note that only students who chose "perhaps", "yes, somewhat", or "yes, a great deal" responded to this question.

For those students who replied "*perhaps*"; "*yes, somewhat*"; or "*yes, a great deal*" to the previous question, Table 45 is provided to show the three most influential reasons for this change. This figures shows the greater than expected responses between cognitive sets. A complete set of the analysis is contained in Appendix G.2.f.

Table 45

Level of Significance Between Cognitive Sets: Top Three Reasons for Changed Learning Strategy

	ST N=243	SF N=32	NF N=38	NT N=128
Adaptation to Teaching	***			***
Influence of Other Students	***			***
Professional Focus	***			***

Level of Significance	Symbol
p < .05	*
p < .01	**
p < .001	***

Note that only students who chose "*perhaps*", "*yes, somewhat*", or "*yes, a great deal*" responded to this question.

"During which quarter do you feel you adjusted to the routine of your educational program?" Greater observed than expected responses to this question included these following three answer Students believed adjustment occurred either in the 1st , 2nd or 3rd quarter. Appendix G.1.g. contain the complete analysis and results for MBTI single letter responses. Tables 46 and 47 summarize the frequency count and results for MBTI letter type.

Table 46

MBTI Single Letter Types: Frequency Count on Quarter Adjusted to Program

	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
I have yet to Adjust	16	29	21	24	33	12	28	17
Short Term	14	29	27	16	38	5	22	21
1st Quarter	64	104	103	65	145	23	105	63
2nd Quarter	99	99	133	65	168	30	133	65
3rd Quarter	50	80	75	55	104	26	92	38
4th Quarter	13	25	22	16	26	12	18	20
5th Quarter	3	7	9	1	9	1	7	3
6th Quarter	4	4	3	5	7	1	5	3
Adjustment Not Necessary	8	14	9	13	19	3	13	9

Table 47

Level of Significance for MBTI Single Letter Types: Quarter Adjusted to Program

	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
I have yet to Adjust	---	---	---	---	---	---	---	---
Short Term	---	---	---	---	---	---	---	---
1st Quarter	***	***	***	***	***	---	***	***
2nd Quarter	***	***	***	***	***	***	***	***
3rd Quarter	---	***	**	***	***	*	***	***
4th Quarter	---	---	---	---	---	---	---	---
5th Quarter	---	---	---	---	---	---	---	---
6th Quarter	---	---	---	---	---	---	---	---
Adjustment Not Necessary	---	---	---	---	---	---	---	---

In examining Table 46, we see that a significant number of Introverts, Intuitive, and Perceiving types seem to require less adaptation (i.e. time to adapt) than other types. In contrast, significant numbers of Feeling and Intuitive types seem to have the most difficulty in adjusting (require more time to adapt).

For cognitive sets, greater than expected responses to this question were found for student adjustment in the 1st quarter, 2nd quarter or 3rd quarter. Appendix G.2.g. contains the complete analysis and results. Table 48 summarizes results for MBTI letter type.

Table 48

Level of Significance Between Cognitive Sets: Quarter Adjusted to Program

	ST N=377	SF N=52	NF N=65	NT N=201
1st Quarter	***	---	---	***
2nd Quarter	***	***	---	***
3rd Quarter	---	---	---	***

Level of Significance	Symbol
$p < .05$	*
$p < .01$	**
$p < .001$	***

Summary

This chapter presented the data analysis and results for each investigative question in this research. In the next chapter, research conclusions are presented.

V. Conclusions

This chapter presents the conclusions based on data results and analysis from chapter IV. The conclusions are discussed in order by investigative question and are followed by the resolution of the research question.

Investigative Question 1

Are the AFIT students' psychological types, as measured by the MBTI, similar to the general population?

The purpose of this investigadive question was to determine if research findings are applicable only to the AFIT graduate school environment or if they could also be generalized to other settings. The question's null hypothesis is that there is no similarity between the psychological type preferences of the sample, as estimated by the MBTI, and that of the general population, as estimated by the SRI International Values and Lifestyles (VALS) program. The sample distribution was the same for Extraverts, Introverts, Sensing, Judging, and Perceiving types; however, a significant difference was found between the sample and the general population for Intuitive, Thinking, and Feeling types. For the cognitive types, there was a difference between the observed sample SF and NT types as compared to the expected value of the general population. Therefore, we fail to reject the null hypothesis. This means that the population of the sample does not have the same distribution of MBTI types or cognitive sets as the general population.

The results of the statistical tests indicate that the population of AFIT students is different from the general population. However, it is important to remember that MBTI single types and cognitive types have the same general characteristics across settings. Well developed preferences for various MBTI categories are similar regardless of the subject and sample settings. Therefore, generalizations to the general population may be made; but one should exercise caution in light of the specific characteristics of the sample. The characteristics such as graduate school attendance, government employment, military service, age and other factors are influences and should be recognized. One can conclude that this research is unique and generalizations to other adult educational settings can be made with caution. While generalizations between schools should be made with caution, it is possible to generalize by psychological type not only in academic settings but to the general population as well.

Investigative Question 2

What are the relationships between one's psychological type and one's preference for classroom configuration?

The purpose of investigative question 2 was to determine if preferences exist in classroom configuration based on one's psychological type. If any common preferences were shown to exist, then recommendations could be made to alter the classroom configuration in an effort to enhance the potential learning preferences of those psychological types for which a common preference exists. This question was structured to reject a null hypothesis that for preferred classroom configurations, observed psychological type frequency distributions are no different than expected frequency distributions.

There were three measurement questions which contributed to addressing this question. The questions addressed which classroom arrangement was most preferred, where a student preferred to sit in a classroom, and which classroom configuration was most often used. Each measurement question was analyzed using chi-square analysis, which was described in chapters III and IV.

Most Preferred Classroom Arrangement. The results involving the most preferred classroom configuration indicated that all single letter MBTI types preferred a semi-circle arrangement to some degree. Other configurations which were preferred include rows (Extraverts, Introverts, Sensing, Thinking, Judging, and Perceiving types) and circles (Extraverts, Intuitive, and Feeling types). However, when analyzing the strength of the preferences between the bipolar types, the results indicated that there are specific preferences. Table 49 summarizes the findings in the significant preferences between the dichotomous and cognitive sets.

Table 49

Significant Preferences of the MBTI Dichotomous and Cognitive Sets

Preferred Configuration:	E	I	S	N	T	F	J	P	ST	NF	NT	SF
Semi-Circle		X	X		X			X	X		X	
Circle	X			X		X				X		
Row		X	X		X		X		X			

One might reason that rows and circles represent the extremes between the three significant configurations. The row configuration represents an instructor-centered and orderly environment, with a certain amount of anonymity, while the circle represents a more informal atmosphere designed to enhance student interaction. The semi-circle allows for visibility of the instructor and other students, which may aid in fostering increased interaction while maintaining focus on the instructor. As a result, the semi-circle may be viewed as representing the middle ground between the row and circle configurations.

Viewing the selected configurations in this manner, one could logically reason that in comparing the bipolar dichotomous types, the row configuration provides the standard structure that might appeal to Sensing, Thinking, and Judging types as a result of their preference for order and logic (Lawrence, 1982: 72, 74, and 76). That is, most classrooms are arranged in that fashion and, therefore, it is the standard for all classrooms. The research findings support this expectation as Sensing, Thinking, and Judging types do exhibit a significant preference for the row configuration.

The openness of the circle configuration might appeal to the Extraverts and Feeling types as it facilitates communication between other students and the instructor, and the face-to-face interaction may aid students in developing a better rapport with one another. Lawrence states that Extraverts communicate well and prefer group projects (1982: 70), and Feeling types are more interested in people and prefer personal rapport (1982: 75). Based on these characteristics and the research findings, we may conclude that the Extraverts and Feeling types do have a preference for the circle configuration due to the opportunities it offers for increased interpersonal communication.

In comparing the preference strengths between the cognitive sets, STs and NFs reflected the preferences of their single letter MBTI types, which was semi-circles and rows for the STs and circles for the NFs. As Myers and Myers describe STs as being very practical and matter-of-fact (1980: 7), one might expect that the standard row configuration would appeal to this cognitive type. In addition, the NFs are enthusiastic and have the ability to communicate (Myers and Myers, 1980: 6-7), and both characteristics may be encouraged through the circle configuration. While the SFs showed some preferences, the strength of the preferences was not at a statistically significant level. The explanation for this is beyond the scope of this research. In addition, the significant preference of the NTs for the semi-circle configuration does not appear to be explained by their attributes of logical and ingenious analysis that neglects any human aspect of a task (Myers, and Myers, 1980: 6-7). One might have expected the NTs to exhibit a preference for the more standard configuration for its logic and emphasis on instructor-centered learning. However, the research findings do not support this conclusion. As a result, further research is required to explain the findings of the SF and NT cognitive sets.

Most Preferred Location in a Classroom. For those dichotomous types that preferred semi-circles and rows, the general seating location was addressed next. Table 50 summarizes the statistically significant preferences.

Table 50

Dichotomous and Cognitive Sets: Classroom Seating Preferences

LEFT	REAR
Introverts	Introverts
Thinking	Thinking
Intuitive	Sensing
Judging	Perceiving
NT	ST

According to Lawrence and McCaulley, Introverts prefer to hold back from new experiences and work alone, like quiet space to work, and need time for internal processing (1982: 71, and 1976: 2). Since sitting in the rear of the classroom might be used as a way of removing one's self from the majority of other students, it would provide an Introvert with the personal space needed to feel more comfortable. In addition, the rear of the classroom might appeal to Perceiving types as a way to exercise their preference for autonomy as well as observe all that occurs (Lawrence, 1982: 77). The research findings support these expectations, so we may conclude that the Introverts and Perceiving types exhibit a significant preference for sitting in the rear of the classroom.

The remaining preferences that were identified are not explainable through an understanding of psychological type characteristics. In fact, some results appear contrary to what one might expect. For example, the Thinking type's characteristic of being more interested in ideas (Lawrence, 1982: 74) may lead one to expect that this type would prefer to be closer to the source of instruction, which would normally be the center and front of the classroom. In addition, one might expect that Extraverts, who like to communicate (Lawrence, 1982: 70) would seat themselves in the center or front in order to be in the middle of any discussion or have better access to the instructor. However, no significant preferences were identified for Extraverts. Another unexpected finding was the Judging preference for the left of the classroom. Further research in this area is recommended for all types in order to explain the research findings.

The analysis of the cognitive sets indicates that STs prefer the rear of the classroom and NTs prefer the left of the classroom. Both of these preferences reflect the preferences of the single letter MBTI types from which the respective cognitive sets are derived. One might anticipate that the preferences of the cognitive sets would, to some degree, reflect the preferences of their single letter MBTI types. However, this was not the case for the SF and NF cognitive sets, whose preference strengths were not statistically significant. Further investigation in this area is recommended to understand the preferences or lack of preferences.

Most Used Classroom Configuration. The response to this question was limited to the reporting of rows as being the most frequently encountered classroom configuration. The reporting of the most used classroom configuration is not the result of one's psychological type, but it could be the result of instructor or staff preferences. As such, future researchers may want to address when the use of the row configuration enhances and detracts from learning objectives. As a result, the classroom environment can be varied within available space and furniture restrictions so as to enhance the learning process.

The overall preferences, as indicated from frequency counts, indicate that the most preferred classroom configurations are semi-circles, rows, and circles. However, the relative strength of these preferences differs within the single letter MBTI dichotomous and cognitive sets. In addition, there are specific seating locations within a classroom which are preferred by several of the psychological types. As a result, the null hypothesis is rejected. However, the research findings indicate that it is possible to accommodate all of the psychological types and cognitive sets to some degree with regards to configuration by implementing the use of the semi-circle configuration in classrooms.

Investigative Question 3

What is the relationship between psychological type and subject matter difficulty as perceived by the student?

This investigative question addressed subject matter difficulty and was structured to reject the null hypothesis that there are no preferences regarding least and most difficult courses based on psychological type. This question was answered by tabulating the results from two, multi-part measurement questions from the Educational Style Survey. These question asked students to identify their five most difficult courses/subjects and their five least difficult courses. The results were analyzed using a Chi-square analysis (see Chapters III and IV).

Most Difficult Courses. In the area of most difficult courses, five of the sixteen possible choices were consistently reported at statistically significant levels. These courses were Economics, Statistics, Accounting/Finance, Computer Programming, and Quantitative Decision Making. Table 51 summarizes these courses and the stronger preferences of the dichotomous sets, and reports the analysis of the cognitive sets.

Table 51

Between Dichotomous Sets: Significant Preferences on Most Difficult Courses

Course:	E	I	S	N	T	F	J	P	ST	NF	SF	NT
Economics	X		X		X		X		X			X
Statistics		X	X		X		X		X			X
Accounting/Finance		X	X		X		X		X			
Computer Programming		X		X	X		X					
Quantitative Decision		X	X		X		X		X			

Least Difficult Courses: In the area of the least difficult courses, five of the sixteen choices were reported at statistically significant levels. These were the courses in Behavioral Studies, Research Methods, Acquisition, and Professional Writing. Tables 52 summarizes the preferences of the single letter MBTI types and cognitive sets.

Table 52

Between Dichotomous Sets: Significant Preferences on Least Difficult Classes

Courses:	E	I	S	N	T	F	J	P	ST	NF	SF	NT
Behavioral Studies		X		X	X		X		X			Xs
Research Methods		X	X		X		X		X			
Acquisition	X		X		X		X		X			
Professional Writing		X		X	X		X		X			
Contracting			X				X					

Based on the research of Myers and McCaulley on preferences in academic subjects (1985: 110), one might reason that preference for a particular subject may be reflected in the selection of least difficult courses, and, that in contrast, those types of courses not preferred might be selected as most difficult courses . However, the results do not always support this reasoning. The following paragraphs address situations when the research findings are supported by existing research as well as instances when they do not.

In looking at the most difficult courses, they tend to involve the application of mathematical skills. Based on the research of Myers and McCaulley, Lawrence, Hoffman and Betkouski, and Schurr and Ruble, the emphasis on mathematical skills would appeal to Introverts, Intuitive types, and ST cognitive types. However, this research does not support this logic as these types reported significant preferences for some of these classes as most difficult.

The Thinking and Judging types also reported significant preferences for Economics, Statistics, Accounting/Finance, Computer Programming, and Quantitative Decision Making as the most difficult classes. Lawrence states Thinking and Judging types are skilled in logical analysis and prefer structured tasks (1982: 74 and 76), and Myers and McCaulley indicate that Thinking and Judging types tend to prefer classes in Science or Mathematics (1985: 110). Again, the logic that preferred classes would not be selected as most difficult does not apply.

In contrast to the courses selected as most difficult, the least difficult courses emphasize reading, writing, or people skills. The courses which emphasized writing were Research Methods and Professional Writing. Behavioral Studies emphasized people skills, and Acquisition and Contracting required extensive reading assignments. Schurr and Ruble, Myers and McCaulley, and Lawrence indicate that Introverts and Intuitive types excel in those areas involving reading. In addition, Lawrence identifies the NT cognitive types as preferring reading (1984: 13). This research indicates significant preferences by Introverts for Research Methods and Professional Writing and by Intuitive types for Professional Writing. However, NF types did not have a significant preference for either of these courses as being least difficult. It is possible that the NF types may not have identified these classes as being least difficult as a result of the research findings of Hoffman and Betkouski -- that they take criticism too personally. NF types may interpret any comments made on their writing skills as an indication that they did not do a satisfactory job. As a result, NF types may have been too critical of their mistakes which might lead them to not identify these courses as least difficult. In any case, the research findings show that Introverts significantly prefer classes involving reading and writing skills, and Intuitive types significantly prefer classes which utilize their writing skills.

The course most closely associated with people skills was Behavioral Studies. Myers and McCaulley state that Extraverts are oriented to the outer world of people, and Lawrence states that Feeling types emphasize people-oriented skills (establishing personal rapport, are empathetic, etc.) As a result, one might expect Extraverts and Feeling types to prefer a class in Behavioral Studies and identify it as being least difficult. However, the research findings indicate that Extraverts and Feeling types did not significantly identify these classes as being least difficult. Therefore, we cannot apply the logic that an interest in a given area, in this case people-oriented skills, will result in a course being identified as least difficult.

While frequency counts result in the same courses or subjects being identified as either most or least difficult, the relative strength of these preferences differ between the dichotomous types and cognitive sets. Thus, the conclusion is supported to reject the null hypothesis. Even though the alternative hypothesis is accepted, it is evident that further research is required in order to understand the relationships between subject matter difficulty and psychological type. It may be possible that difficulty and lack of difficulty associated with a course is the result of other factors which are not evident through this research.

Investigative Question 4

What is the relationship between a student's psychological type and study strategy?

This investigative question addressed student study strategy, and was structured to reject the null hypothesis that there is no difference between observed and expected values for a student's study strategy by psychological type. A Chi-square analysis was conducted on the responses to questions from the Educational Style Survey. The measurement questions which were used addressed the use of study groups, the number of students in study groups, and personal learning objectives for subjects disliked and liked

Study Groups. Overall, the use of study groups was common across all of the MBTI single letter groups, even though the percentages of those who chose to participate and the preferred number of participants varied by type. Table 53 is a summary of the results on study group size and usage This table summarized the results between MBTI bipolar types and between MBTI bipolar cognitive sets.

Table 53

Summary of Study Group Size and Percentage Who Used (Between Types and Sets)

	E	I	S	N	T	F	J	P	ST	SF	NF	NT
% That Used Study Groups	77 %	69 %	72%	73 %	71%	76 %	71 %	75 %	54 %	56 %	63 %	55 %
Preferences for # Study Groups:												
1				X								X
2		X	X		X		X		X			X
3		X	X		X		X		X			X
4	X		X		X		X		X			X
5	X				X		X		X			

According to Jung, Lawrence, and Myers and McCaulley, Introverts tend to be quiet and contemplative. As a result, one would expect that Introverts who do choose to participate in study groups would prefer groups of smaller size since they may feel uncomfortable in larger groups. This is confirmed by the Introverts' response that indicated that the size of their study groups included 2-3 people. In contrast, Extraverts, who prefer group activities (Lawrence, 1982: 70), might be expected to prefer larger groups so as to increase the amount of interaction. This is supported by their significant preference for larger groups of 4-5 people.

The scales are "relatively" equal in percentage who participated when you examine only MBTI single letter types with the exception of the Extravert/Introvert scale. This supports the notion that this scale best identified interaction and personal contact. When one looks at the research data, the notions of the Extravert and Introvert characteristics are supported by the number of group participants.

A large percentage of Perceiving types (75%), which are described by Lawrence as preferring autonomy and independent study (1982: 77), used study groups, even though no particular size was preferred at a significant level. One might have expected that Perceiving types would have not been as involved in study groups due to their preference for independent study. Because a large percentage of Perceiving types did use study groups, an understanding of why this occurs requires further study.

Within the cognitive sets, Table 53, the STs and NTs reflected a greater involvement in study groups than did the SFs and NFs. If the findings are viewed based on the common MBTI single letter type between those who were involved in study groups and those who were not, it appears that they are grouped according to the rational functions of Thinking and Feeling. Lawrence differentiates between the two rational functions by describing Thinking types as being more interested in ideas, and Feeling types as being more interested in people (1982: 74-75). In addition, Hoffman and Betkouski indicate that SF students have a preference for working together. As a result, one might have expected that SFs and NFs would have reflected greater involvement in study groups based on the social characteristics of their Feeling aspect. Further research is needed on why STs and NTs exhibited greater involvement in study groups than did SFs and NFs.

Personal Learning Objectives. The final question in the area of study strategies dealt with personal learning objectives associated with courses like and disliked. Individual frequency counts for each MBTI single letter type and the four cognitive sets indicated that for courses disliked, all types set a learning objective of "*gain a general understanding*." Only the Introverts, Sensing, Feeling, and Perceiving types and the ST cognitive set indicated an additional preference to "*learn only enough to pass...*". Table 54 summarizes the significant preferences between the dichotomous and cognitive sets.

Table 54

Significant Learning Objectives Between Dichotomous Sets

Learning Objective:	E	I	S	N	T	F	J	P	ST	NF	NT	SF
Gain an understanding	X		X		X		X		X		X	
Learn enough to pass		X	X			X		X	X			

In addressing the dichotomous sets, one might have expected that Intuitive types, with their quickness of insight and interest in new concepts (Lawrence, 1982: 73), would have exhibited a stronger preference for "*gain a general understanding*" or "*master the subject.*" However, the research findings indicate that they did not report a significant preference for either of these learning objectives. In addition, the Introverts exhibit a significant preference to "*learn only enough to pass...*". Since Lawrence describes this type as preferring mental tasks and having a greater capacity for sustained attention, one might have expected that Introverts would have exhibited preferences which reflected more challenging learning objectives than simply learning enough to pass the course. Further clarification of this finding is necessary.

The research findings of the Thinking and Judging types indicates that these types have a significant preference to "*gain a general understanding*" of the material presented. As these types are characterized by Lawrence as exhibiting endurance and being self-regimented (1982: 74 and 76), it is possible that Thinking and Judging types have the focus necessary to apply themselves in their studies. Thus, this research aids the conclusion that Thinking and Judging types set higher learning objectives for themselves.

Within the analysis of the cognitive sets, the stronger preferences are exhibited by the cognitive sets that have Thinking as the rational function. The stronger preferences are for "*gain a general understanding*", exhibited by the STs and NTs, and "*learn only enough to pass...*", exhibited only the STs. As Thinking types focus on the use of logic, reasoning, and analysis (Lawrence, 1982: 74), it is possible that these skills are employed so that assigned material is thoroughly understood prior to continuing on to new material. As a results, the Thinking cognitive sets exhibit the learning objective of gaining an understanding with greater significance than do the Feeling cognitive sets.

Students were asked to provide their learning objectives for courses they liked. The most frequent answer of across all of the single letter MBTI types was to "*master the subject*". The Introverts, Sensing, Feeling, and Perceiving types also indicated a higher than expected preference for "*gain a general understanding*." Table 55 summarizes the significant preferences between the dichotomous and the cognitive sets.

Table 55

Significant Learning Objectives Between Dichotomous Sets: Classes Liked

Learning Objective:	E	I	S	N	T	F	J	P	ST	NF	NT	SF
Master the subject		X	X		X		X		X		X	
Gain an understanding		X	X			X		X				X

According to Lawrence, Introverts desire achievement (1982: 71), which may be obtained by mastering a subject or gaining an understanding. This research indicates that Introverts have significant preferences for these two objectives. Therefore, the conclusion that Introverts exhibit significant preferences for higher learning objectives is supported through an understanding of their psychological characteristics.

The significant responses of the Sensing versus the Intuitive types indicate that the Sensing types report the stronger preference for both learning objectives -- "*master the subject*" and "*gain a general understanding*." One might have expected that Intuitive responses would have reflected a higher preference for at least one of the objectives. This results from the conclusions by Pritcher and Blaushild and Hoffman and Betkouski that

Intuitive types have a significant advantage over the Sensing types in the college environment due to their emphasis on dealing with abstract thoughts and verbal words. In understanding why this did not occur, it is possible that the Sensing types' preference for extrinsic motivation (in the form of grades) provided the incentive that resulted in their having a stronger preference with regard to personal learning objectives.

The Thinking and Judging types indicated a greater preference to "*master the subject.*" These preferences may be strongly associated with their skills of logic and endurance (Thinking) and self-regimentation, and ability to establish goals (Judging). The reasoning as to the stronger preference of Feeling and Perceiving types for gaining an understanding of "liked" courses may not be as readily apparent. A possible explanation may be these types placed more energy in other pursuits in addition to their schoolwork. For example, since Feeling types emphasize the people-aspect of a given situation, their energies may have been directed toward working on relationships in addition to their studies. The Perceiving types may have been too restricted by the time-element of their studies. Their spontaneous nature may have resulted in a significant preference for a learning objective that allowed them time for other activities. A preference for the learning objective of gaining an understanding may have been appropriate in order to accommodate the characteristics of Feeling and Perceiving types.

In addressing the cognitive sets, the sets that involve the rational function of Thinking once again exhibited the preference for the higher learning objective - mastering the subject. As before, the Thinking types characteristics are used to support the conclusion that the Thinking cognitive sets would set higher learning objectives than do the Feeling cognitive sets.

The analysis of frequency counts reflected similarities among the single letter types and cognitive sets. Analysis of the relative strengths of these preferences indicated that there are variations within the dichotomous types and cognitive sets. Some results were as anticipated, while others were not. It is those areas in which the results were not expected that further research may be required in order to fully understand the results obtained. Of special note for further research is the dominance of the cognitive sets that have Thinking as the representative "rational" function. Because the findings indicate that significant preferences were attributed to psychological type, the null hypothesis is rejected. Therefore, the alternative hypothesis is accepted that states psychological type does influence one's study strategy, even though further investigation may be required so as to fully understand the relationship.

Investigative Question 5

What are the relationships between psychological type and one's preference for testing methods?

The purpose of this investigative question was to determine what relationships exist by student psychological type for testing methods. If relationships exist, utilizing various formats within a single examination could aid in recognizing and reducing unintentional advantages as a result of preferences within psychological type.

There were three measurement questions posed to the student that asked them to specify the type of exam they preferred, the type of exam question they preferred, and the type of question stem they preferred. Each measurement question was analyzed using the chi-square analysis procedure described in chapters III and IV. The null hypothesis is that for preferred testing methods, observed psychological type frequency distributions are no different than expected frequency distributions. Table 56 summarizes the significant responses for these three questions.

Table 56

Results for MBTI Single Letter Types: Question Stems Preferred

	E	I	S	N	T	F	J	P	ST	SF	NF	NT
Preferred Exam Type												
Objective	X	X	X	X	X	X	X	X	X	X	X	X
Question Preference												
Written	X	X	X	X	X	X	X	X	X	X	X	X
Question Stems Preferred												
True/False	X	X	X		X		X	X	X			
Why	X	X	X	X	X	X	X	X	X			X

Preferred Exam Type. The results from the question, "*Which type of exam do you prefer*?" showed that all types and cognitive sets had a frequency count for objective examinations versus subjective or no preference. Sensing types are characterized by a memory for facts and details, such as one would find on an objective test. The findings support this characterization.

In contrast, one might expect that Intuitive types may prefer subjective tests (essay tests) versus objective tests since they prefer to work with whole concepts rather than details. However, the findings do not support this expectation. Since the reason for their selection was not investigated, this could be an area that would benefit from further research.

While all types reported objective questions as their preferred type of question, the analysis between types showed that the Introverts, Sensing, Thinking and Judging types reported a stronger preference for objective exams as compared to their bipolar opposites. These results are supported by research in psychological type and written testing methods accomplished by Provost and Anchors. The literature shows that Sensing types, with a good memory for facts and details, and Judging types, with qualities of decisiveness and an aim to be right, prefer objective type tests. Thinking types prefer to analyze and weigh facts as well as preferring the objective and impartial types of questions. The characterization of thinking types supports the findings of this research.

The NT and ST cognitive sets had a stronger preference for objective tests when compared to their bipolar opposites. The NT cognitive types tend to be logical and approach things on an impersonal basis. Decisions made by the ST types are make after impersonal analysis of facts using logical reasoning. These characterizations support the results discovered in this research. One may expect that NFs would prefer subjective test due to their preference for creative challenges. Since this result was not found in this research, further investigation into this area may be beneficial.

Question Preference. The results from the question, "*Which type of test question do you prefer*?" showed that all types and cognitive sets preferred written test questions versus oral, performance or no preference. Between types, the Introverts, Sensing, Thinking and Judging types showed a stronger preference for written types of test questions as compared to their bipolar opposites. One would expect that Introverts would respond in this manner since they prefer written assignments and like to work in quiet spaces. Extraverts did not exhibit a strong preference for oral exams even though they are characterized as communicating well. The NT and ST cognitive sets had a stronger preference for written questions as compared to their bipolar opposites. Additionally, Sensing types prefer to use their five senses and one may anticipate that they may prefer performance type test. Further research in this area would be beneficial in understanding the relationships analyzed in this study.

Question Stem Preference. For the question, "*Which type of question stem do you prefer*?", each type had a higher than expected preference for the question stem "*Why* *does the sun rise in the East*?". All types except Intuitive and Feeling had a high frequency count for the true/false question stem -- "*The sun rises in the East. True/False.*" There were two choices that were not chosen as a preferred question stem by any type. These choices were: (1) "*Discuss the benefits to mankind because the sun rises in the East*", and (2) "*Picture in your mind the sun rising in the East. Describe your impressions and feelings.*"

When analyzing between types, Intuitive types had a preference for the question stem "*Why does the sun rise in the East*" while Sensing types had a preference for true/false question stems. Intuitive types prefer to work with concepts and are good at tasks that calling for insight and in seeing relationships. The response by Intuitive types is a preference for the type of question that likely allows them to use their ability for insight and application of concepts. Sensing types prefer orderly, detailed tasks and are good at tasks that call for carefulness, thoroughness and soundness of understanding. Sensing types may prefer the true/false question that generally requires a thorough understanding of details and requires a careful attention to detail.

One may expect that Feeling types might prefer the question dealing with "*Discuss the benefits to mankind..*"", as they are more interested in people than in ideas and things. Additionally, Intuitive types are able to see the abstract, deal with concepts and have flashes of imagination that would lead one to believe they would prefer to express a picture in their mind for a test. However, Feeling and Intuitive types reported a preference "*Why does the sun rise in the East.*" Further research in this area could prove to be beneficial.

For the cognitive sets, ST types had a preference for both the true/false question and "*Why does the sun rise in the East*" and NT types had a preference for the latter question. The SF and NF types had no high frequency counts for their preferences. ST types are practical and matter of fact (Myers and Myers, 1980: 7) and would likely adapt to true/false questions and questions in which an explanation is necessary. NF types had higher than expected preferences that indicates that they chose each response relatively equally. These students are insightful and, as students, they prefer creative challenges. It is possible that the NF students were able to see the creative challenge to each question and therefore spread out their responses across the choices. NT types chose "*Why does the sun rise in the East?*" which is expected given the intuitive nature of these types.

Relationships do exist for testing methods when comparing observed and expected frequency distributions by psychological types. While each student generally prefers objective and written tests, the relative strengths of these preferences vary by type. For the question stems, specific psychological types prefer one type of question stem to another. Additionally, the relative strengths of preferences vary by psychological type. These results show that there is a relationship for testing methods by psychological types. Therefore, the null hypothesis is rejected and the alternative is accepted.

Investigative Question 6

Is there a relationship between psychological type and the amount of interaction of students and faculty?

This investigative question's purpose was to determine if relationships exist by student psychological type and their interaction with the faculty. Discovery of a relationship for the investigative question could provide insight to what drives the student-faculty interaction. This could assist in dispelling some negative assumptions about a student's interest in a subject (i.e., lack of interaction indicates a lack of interest in the topic). Utilizing various formats within a single examination could aid in reducing unintentional favoritism as a result of preferences within psychological type and strengthen all faculty-student communication efforts.

There were four measurement questions that queried the students about the frequency of their visits with Course Instructors, Academic Advisors, Option Managers, and Thesis Advisors. Each measurement question was analyzed using the chi-square analysis procedure described in chapters III and IV. The null hypothesis is that for visits to the faculty, observed psychological type frequency distributions are no difference than expected frequency distributions.

The results from the questions, "*How often did you visit your Course Instructor? Academic Advisor? Option Manager? Thesis Advisor*" showed that all types and cognitive sets visited the faculty to some degree. Table 57 summarizes the high frequency responses for each question.

Table 57

Significant Frequency Counts for MBTI Single Letter Types: Visits to Faculty

	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
Course Instructor								
Once During a Course	113	178	168	123	236	55	178	113
Once a Month	75	95	120	50	149	21	115	55
Academic Advisor								
Once During a Course	95	81	152	84	197	39	152	84
Once a Month	116	98	172	108	230	50	180	100
Option Manager								
Never	81	126	128	79	176	31	130	77
Once During a Course	70	122	125	67	156	36	114	78
Once a Month	72	88	92	68	131	29	108	52
Thesis Advisor								
Once a Week	84	72	120	75	166	29	131	64
Once in Two Weeks	93	78	150	90	197	43	156	84
Once a Month	59	53	91	61	131	21	92	60

Depending on the question, high response frequencies ranged from "never" to "once a week." While Extraverts and Introverts both visited the faculty to some degree, Extraverts visited the faculty more frequently than did Introverts. This is as anticipated because Extraverts are oriented to the outer world and prefer group activities and to offer opinions. Conversely, Introverts are oriented to the inner world and like written projects and quite spaces. With these social characteristics, one would anticipate that Extraverts would visit faculty more often than Introverts.

Sensing, Thinking, and Judging types generally had a stronger preference for visits to faculty than did their dichotomous opposites. Sensing types tended to visit the faculty more often than did Intuitive types. Because of the Sensing type's need for thoroughness and a sound understanding of a subject, one would predict them to visit the faculty to gain this understanding. Intuitive types work conceptually and tend to jump to conclusions, which may cause them to believe they understand a subject without the need to visit with faculty to clarify specific points. Thinking types may visit their instructors more frequently than feeling types to discuss test results or to clarify ideas. Thinking types are upset by injustice and may argue for grades with faculty, while Feeling types may stay away since they are upset by conflict and desire affiliation.

Each cognitive set type visited the faculty. The NF and SF interaction is likely due to their interest in people, which reflects their Feeling aspect. The NT and ST cognitive sets had a relatively stronger preference for frequency of visits to faculty as compared to their dichotomous opposites. For the NT cognitive set, this may be due to the desire for new concepts and knowledge that could be provided by interaction with faculty. ST types are practical and their learning emphasizes a need for definitions that could be provided with interaction with faculty.

Relationships do exist for visits to the faculty when comparing observed frequency distributions and expected frequency distributions by psychological types. While each psychological type visited the faculty, the relative strengths of these preferences for visits vary by type. These results show that there is a relationship for visits to the faculty when comparing observed versus expected responses by psychological types. Therefore, the null hypothesis is rejected and the alternative is accepted.

Investigative Question 7

What is the relationship between psychological type and one's ability to adapt to academic stress?

The purpose of this investigative question was to determine if relationships exist by student psychological type and their ability to adapt to academic stress. If relationships exist, students may better understand their adaptability and may relieve any self-imposed anxiety concerning the transition to the academic environment. Additionally discovery of any relationships for the investigative question could assist faculty in balancing curriculum difficulty and workload with an adaptation period.

There were seven measurement questions for this investigative question. These questions included feelings about grade point average, if students had considered dropping out of the educational program and why, how many courses were dropped/added during the program, whether preferred learning strategies had changed and why, and when students felt they had become adjusted to the routine of the educational program. Each measurement question was analyzed using the chi-square analysis procedure described in chapters III and IV. The null hypothesis is that for adaptability to academic stress, observed psychological type frequency distributions are no difference than expected frequency distributions, while the alternative hypothesis is that for adaptability to academic stress, there is a difference between observed psychological type frequency distributions and expected distributions.

The results from the question, "*How do you feel about your grade point average*?" showed strong responses to this question for each MBTI type and cognitive set for the responses of "*About right*" or "*Lower than it should be.*" Extraverts felt their grade point was "*About right*" and Introverts felt that their grade point was "*Lower than it should be.*" Introverts desire achievement which may be the reason they believed their grade point was lower than it should be.

Perceiving types felt that their grade point was "*About right*", while Judging types felt that their grade point was "*Lower than it should be.*" Judging types tend to be self-regimented and steady. They aim to be right while Perceiving types are flexible and adaptable. One might expect that the nature of these types would cause Judging types to be harder on themselves than Perceiving types. The strength of response of a grade point being lower than it should be did not show this, however. Perceiving types have a stronger response of "*Lower than it should be*" and "*About right.*" The response of "*About right*" is as anticipated because Perceiving types are expected to be more easy going and adaptable in their perception of the outer world.

Between cognitive sets, the NFs had a high response of "*About right*" as compared to ST types. Between the NT and SF types each set responded that their grade point average was "*About right*" to the same degree. That is, there was no difference in the relative strength of response between the NT and SF types.

For the question, "*Have you seriously considered dropping out of your educational program*?" and "*What was the prime reason why you considered dropping out of your program*?", each type strongly responded "*No*", they had never seriously considered dropping out of the program. Table 58 shows the frequency of response for whether students had considered dropping their educational programs.

Table 58

Frequency and Percent of Those Who Did Not Consider Dropping Program

	E N=283	I N=412	S N=429	N N=266	T N=578	F N=117	J N=445	P N=250
Frequency Responding No	265	364	388	241	528	101	411	218
Percent Responding No	94%	88%	90%	91%	91%	86%	92%	87%
Frequency Responding Yes	18	48	41	25	50	16	34	32

According to Tinto, frequent contact with the faculty seems to be an important element in student persistence in an academic program. The response that students had not considered dropping out of the program may be expected since each type has contact with the faculty to some degree. It may also be credited to the students' strong commitment to the program, fear of failure, or other causes. For those people who responded "*Yes*", they had considered dropping out of the program (6-12% of the types), high frequency responses of "*Other*" came from Sensing and Thinking types and ST cognitive types. This may be an area for further research to determine what these other reasons may be and to assess whether there is some commonality within these reasons.

The results from the question, *"How many classes have you dropped or added during your program?"* showed that most students did not drop or add classes. When students did make changes to their schedules, most only dropped one and added another. Perceiving types had a tendency to not change classes while Judging types did. Perceiving types are flexible and adaptable so one would expect that they would adapt to their schedules easier than Judging types. More frequent than expected responses were also found for Introverts, Sensing and Thinking types as well as ST and NT cognitive types. Additionally, the strength of the responses varied by MBTI type and cognitive set.

For the question, "*Do you believe your preferred learning strategies have changed...?" and "What were the three MOST influential causes for this change?"*, each type except Feeling types responded strongly that their learning strategies had changed. Table 59 summarizes the significant responses to these questions.

Table 59

Changes in Learning Strategies

Did Preferred Learning Strategies Change	E	I	S	N	T	F	J	P
Perhaps	X	X	X	X	X	---	X	X
Yes, Somewhat	X	---	X	X	X	---	X	---
Top 3 Most Influential Reasons for Changed Learning Strategy								
Adaptation to Teaching	X	X	X	X	X	X	X	X
Influence of Other Students	X	X	X	X	X	X	X	X
Professional Focus	X	X	X	X	X	X	X	X

Perceiving types are flexible and adaptable and one may predict that they would change their learning strategies. However, Judging types have settled opinions and prefer to have things decided and steady. One would expect that they may not change learning strategies. As this was not the case, additional research into this area may be beneficial. For the cognitive sets, STs and NTs replied that their learning strategies had also changed. There was a difference between the strength of these responses for the MBTI types and cognitive sets. For those who responded positively to the change in learning strategy, the top three reasons among the twelve choices were "*adaptation to teaching strategies*", "*influence of other students*", and "*professional focus.*" Each MBTI type and cognitive set give a higher than expected response to each of these three choices. However, the relative strength of these choices varied between MBTI types and cognitive sets.

The results from the question, "*During which quarter do you feel you adjusted to the routine of your educational program*?" showed a higher than expected response for the answers of "*1st quarter*", "*2nd quarter*" and "*3rd quarter.*" Again, the adaptability of Perceiving types may lead one to believe that they would adapt to the educational program more quickly than Judging types. However, this was not the case. Each type adjusted in the 1st, 2nd or 3rd quarter. This area may require further research to determine the underlying reasons for these responses. Each MBTI type chose (more than expected) "*2nd quarter*", while all but Feeling types chose "*1st quarter*" and all but Extraverts chose "*3rd quarter.*" Strong responses for cognitive sets also included these three responses. While each MBTI type and cognitive set generally chose each of the these answers as significant, the relative strength of these choices varied between MBTI bipolar types and cognitive set bipolar types. In examining Table 46 (page 91), we see that a statistically significant number of Introverts, Intuitive, and Perceiving types seem to require less adaptation (i.e. time to adapt) than other types, and a statistically significant number of Feeling and Intuitive types seem to have the most difficulty in adjusting (require more time to adapt).

Relationships do exit by psychological type for adjustment to academic stress. Most students felt that their grade point average was about right or lower than it should be, did not consider dropping out of the program, felt their learning strategies had changed for approximately the same reasons, and adjusted to the educational program somewhere between the 1st and 3rd quarter. There were higher than expected responses for several of these questions and higher than expected values for the relative preference strength for each of the questions. Therefore, the null hypothesis is rejected and the alternative is accepted.

Research Question

What are the relationships between Myers-Briggs psychological types and preferences for various aspects of the academic environment?

The statistical test and analysis results from Investigative Questions 2 - 7 provide conclusive evidence that relationships between AFIT student psychological types and preferences within the academic environment do exist. However, the statistical test and analysis results from Investigative Question 1 indicate that the AFIT student population is different than the psychological type distribution of the general population. Therefore, this research is unique and generalizations to other adult educational settings should be made with caution. However, MBTI single types and cognitive types have the same general characteristics across settings; and, therefore, it may be possible to generalize by psychological type in academic settings, and to the general population as well.

Summary

This chapter discussed the conclusions for the investigative questions and research question. The next chapter presents the recommendations based upon the research performed in this study.

VI. Recommendations

The purpose of this research was to determine if relationships exist between psychological types, as measured by the Myers-Briggs Type Indicator (MBTI), and the academic environment, as measured by the Education Style Survey (ESS). In order to enhance the learning process, analysis of the academic environment was accomplished by relating student academic preferences to psychological types. Chapter V showed that there are significant relationships between psychological types and various aspects of the academic environment. This chapter presents recommendations based upon findings from the information gathered and analyzed as well as recommendations for future research efforts.

Recommendations Based upon Findings

Recommendations based upon this research are directed toward AFIT administrators and faculty, who should be informed of the results. Specifically, administrators and faculty should be aware that significant relationships exist between psychological type and student preferences with regard to classroom arrangements, subject matter difficulty, study strategies, and types of examinations. The research findings provide some insight into the frequency of student-initiated visits with the faculty as well as the students' adaptability to academic stress. Consideration of the findings by the administration and faculty may help understand why some students excel in specific environments while others do not. This may aid the faculty in their assistance of students who do not excel in certain academic environments.

It is recommended that the Dean of the School of Logistics and Acquisition Management organize a faculty and staff working group to analyze and apply these findings to the AFIT environment. As a result, improvements could be implemented to the academic environment that would enhance the learning experience for all students. While it is noted that it would be difficult for the faculty to accommodate all types and preferences in their classrooms; the opportunity exists to accommodate the majority of types. For example, faculty members may wish to employ a variety of questions types in examinations to avoid favoring one psychological type over another. In addition, course curricula may need to be balanced between the number of most and least difficult classes in any given term.

Recommendations for Further Research

This study produced several areas for further study. The following are some of the areas that could be extensions of this research.

Unanticipated Results. There were a number of areas in which a specific response was anticipated but the response did not occur at a statistically significant level. These areas should be examined to determine the reason for these results. Specific areas are identified below.

Dominance of the Thinking Aspect of the Cognitive Sets. The dominance of the cognitive sets that have Thinking as the representative "rational" function is recommended as an area requiring further research. This results from the observation that the Thinking cognitive sets had more statistically significant results than did the Feeling cognitive sets. It may be possible that this resulted from the limited number of Feeling types in the sample, or it may be the result of characteristics of the

Thinking types. In either case, an explanation of why this occurred might be obtained through further research.

Preferred Classroom Configuration. For preferred classroom configuration, the SF cognitive types did not reflect the same preference of the Sensing and Feeling types of the single letter MBTI types. Since one might have expected that the preferences of the cognitive sets would reflect the preferences of the single letter types to some degree, further research may provide any explanation of why this did not occur. In addition, the preference of the NFs for the semi-circle arrangement warrants further investigation as this preference is not explained through an understanding of the NF cognitive type.

Seating Location in the Classroom. In addressing the area of preferred seating location in the classroom, some of the findings were not as expected. It is for these findings that further research is recommended. The preferences of Thinking types for the left and rear of the classroom should be addressed, as well as the preference of the Judging types for the left of the classroom. This is recommended since an understanding of psychological type does not explain these preferences. In addition, the lack of significant preferences for Extraverts, SFs, and NFs should be addressed to determine why significant preferences were not reported.

Effectiveness of Various Classroom Configurations. The findings indicate that rows were identified as the most frequently used classroom configuration. However, the findings also indicate that there were other significant preferences with regards to configuration. In particular, semi-circles were identified as the most preferred arrangement within the five choices. Further research may want to address the effectiveness of various combinations on course learning objectives for the courses. If various combinations are identified, then the classroom environment could be varied within available space and furniture restrictions to enhance the overall learning process.

Most and Least Difficult Courses. The identification of most and least difficult courses and their relationship with student psychological type is recommended for additional research. Based on the research by Myers and McCaulley on preferences in academic subjects, one could reason that if a student likes a particular subject area, then courses that involve the subject area might be selected as least difficult courses. Conversely, courses that do not involve these subject areas may be selected as most difficult courses. However, results for some psychological types indicate that this logic does not always apply. Research in this area may further an understanding these relationships, or may aid in determining if other factors influence the identification of the most and least difficult courses.

Study Group Usage and Preferred Size. The analysis of study group usage and size provided some findings that would benefit from further research. These areas include the use of study groups by the Perceiving types and all of the cognitive sets, the size of the study groups used, and the possible relationship between perceived course difficulty and the use of study groups. In addressing the involvement in study groups, the ST and NT cognitive sets reflected a greater involvement in study groups than did the SF and NF groups. The grouping of the sets appears to be based on the rational types of Thinking and Feeling. However, when these results are compared with the single letter MBTI types, Feeling types were more involved than Thinking types in study groups. One could have reasoned that the cognitive sets would have reflected the results of the single letter MBTI types. Since this was not the case, further research in this area is recommended in order to provide insight into these results.

Research into the preferred size of study groups may provide additional insight for Feeling and Perceiving types since analysis of the data did not reveal a preference for any specific group size. One would have expected that Feeling types, being more interested in people, would have had a statistically significant preference for large groups of people. In contrast, Perceiving types, who prefer independent study, might have been expected to have a statistically significant preference for smaller groups of people. As the results do not support these expectations, both areas require further study in order to better explain these results.

The final recommendation is to investigate the possible relationship between subject matter difficulty and use of study groups. This recommendation is made based on the observation that the types of classes for which study groups were used were the classes identified as being the most difficult (Computer Programming, Quantitative Decision Making, Statistics, and Economics). Based on this information, one might infer a relationship between difficult courses and the use of study groups.

Personal Learning Objectives. In the area of personal learning objectives for courses disliked, Introverts and Intuitive types did <u>not</u> report a statistically significant preference for either objectives of "*gaining a general understanding*" or "*mastering a subject*". Because Introverts prefer mental tasks and Intuitive types exhibit quickness of insight and interest in new concepts, one might have expected that each type would report a statistically significant preference for at least one of these personal learning objectives. Since none of these results were obtained, further research is recommended in order to understand the learning objectives for the Introvert and Intuitive types.

Testing Preferences. Within the area of testing preferences, unanticipated results were found in the types of exam preferred and preferred question stems. In identifying testing preferences, the dominant response was for the use of objective tests. This contrasts with the expectation that subjective tests should have been preferred by several of the other types. In particular, NFs with their preference for creative challenges, Extraverts due to their ability to communicate well and offer opinions, and Intuitive types with their ability to work with whole concepts instead of details. In addition, one may have expected that oral examinations might have been preferred by Extraverts due to their communication abilities, and that Sensing types may prefer performance tests due to their characteristic of working through their senses. However, as these results did not reflect any of these expected preferences, additional research is recommended.

For question stems, the dominant responses were for "*true/false*" or "*explain why*" questions. One may expect that Feeling and Intuitive types might have preferred the question stem on discussing the benefits to mankind. This is because Feeling types are more interested in people and give weight to relevant personal values, and Intuitive types work well with abstraction and in dealing with whole concepts. Additionally, the question stem that requests the respondent to "*picture in your mind*" and then describe impressions and feelings may have been preferred by the Intuitive types since they are more adept at dealing with abstraction and have flashes of imagination. Since none of these results were found, further research in this area may prove to be beneficial in explaining why.

Student Withdrawal. In addressing the issue of student withdrawal (voluntary and academic dismissal), a twofold recommendation is made. The first portion of the recommendation is to continue research in the "*Other*" category on the Educational Style Survey. This is recommended since "*Other*" was the response that occurred with the highest frequency among those who considered dropping out of the program (Sensing and Thinking types and the ST cognitive types). The second portion is to establish a mechanism and collect data on those student who withdraw. This is suggested since no data were available on student withdrawal (voluntary or as a result of academic failure). This aspect may be of particular importance to the AFIT staff due to the once-a-year admission of new students into the program. This practice results in the inability to replace a student who withdraws from the program with another student. It would seem logical that information regarding the characteristics or circumstances involving student withdrawals would be of importance to the AFIT staff. However, in conducting this research, no data in this area were available. By collecting data, future researchers may be able to develop a profile for those students likely to withdraw, as well as the circumstances surrounding withdrawals. The intent of this recommendation is to determine if there are common characteristics or circumstances that could be addressed by AFIT's corporate management in order to suggest improvements that might decrease the withdrawal rate.

Changes in Learning Strategies. Analysis of the findings on changes in learning strategies indicates that Judging types reported statistically significant changes in their preferred learning strategies. These results were unexpected since Judging types tend to be decided and settled as well as being self-regimented. One might have expected that these characteristics are well-suited to success in an academic environment, and that those who possess them would not need to change their learning strategies. However, since the Judging types did indicate that changes occurred in their learning strategies, additional research is required to determine an explanation for these findings.

Adjustment to Academic Program. It was expected that certain psychological types might adapt more quickly to the academic program than their bipolar opposites. In particular, the Perceiving types, who are more flexible and adaptable, might have been expected to adjust more quickly than the Judging types, who are self-regimented and tolerant of routines. The adjustability of Introverted and Intuitive types might be shorter than that of their bipolar opposite (Extraverts and Sensing types) due to their implied advantage in the academic environment. Since these expectations were not reflected in the findings, additional research in this area is recommended.

Correlation Analysis. This research was of an exploratory nature with chi-square analysis used to determine greater than expected observed frequencies for each measurement question. This research should be extended to take the results of this research and perform correlation analysis to determine the strength of the relationships between psychological types and academic preferences.

Continued Data Collection on MBTI Types and ESS Responses. Data should continue to be collected on AFIT students through the MBTI and through the ESS so that more detailed research can be conducted concerning the relationship between psychological type and academic preferences. The current research was limited to examination of the MBTI single letter type and cognitive sets due to the limited number of Feeling types. The sample size is not large enough to support an in-depth examination of relationships between MBTI four letter types and academic preferences. With additional survey responses, researchers could explore the roles of the MBTI dominant and auxiliary functions, refine the strengths on the dichotomous scales, and determine preferences for the sixteen MBTI four letter types.

Expansion of the ESS. The data collected in the areas of classroom configuration and the use of study groups could be expanded to allow for further analysis by adding several questions. This is recommended since the data collected through the ESS indicated that the most common classroom configuration was that of rows (even though students indicated a preference for the semi-circle configuration), and that study groups were used, to some degree, by all MBTI single letter types. The following questions are recommended for inclusion.

(1) Given a row configuration, where do you most often prefer to sit? (Select one from each column.)

____A. Front	____E. Left
____B. Center	____F. Center
____C. Back	____G. Rear
____D. No Preference	____H. No Preference

The responses to this question may provide insight into the preferences of the types with regard to the most common classroom arrangement utilized.

2. In which classroom arrangement would you feel most comfortable while engaging in open discussion with the instructor and the other students?

____A. Rows ____B. Semi-circle
____C. Circle ____D. Clusters
____E. Scatter

3. Which classroom arrangement do you think best accommodates courses based on lecture?

____A. Rows ____B. Semi-circle
____C. Circle ____D. Clusters
____E. Scatter

4. Which classroom arrangement do you feel best facilitates the use of teams during classroom exercises?

____A. Rows ____B. Semi-circles
____C. Circle ____D. Clusters
____E. Scatter

The responses to questions 2-4 may provide insight as to whether the objectives for a course may be better suited to a certain classroom arrangement.

5. If study groups were used, what is your opinion of their effectiveness?

____A. Helped increase my understanding of course material.
____B. Frustrating - I did most of the work.
____C. Helped me get to know other students.
____D. Of no benefit.

The response to this question may aid in understanding how the various psychological types respond to the use of study groups.

Faculty Version of Survey The final recommendation is to develop and administer a variation of this survey to instructors in order to determine, and eventually address, conflicting areas. In particular, the questions concerning classroom configuration, testing methods, and student/faculty interaction could be reworded to determine the preferences of instructors. These results could then be compared to those of the students to determine areas where improvements could be maae that would best enhance the overall learning process.

Summary

This exploratory research identifies student preferences with regard to the academic environment based on the use of chi-square analysis to indicate higher than expected frequencies. The chi-square analysis addresses the preferences for each MBTI single letter types and cognitive set, and preferences between the associated dichotomous sets. While recommendations for further research are included in order to understand some of the results, other results could be addressed immediately in order to make improvements that could enhance the academic environment.

Appendix A - Descriptions of the Sixteen MBTI Psychological Types

The Sixteen MBTI Psychological Types

ESTJ

The ESTJ types are practical realists, matter-of-fact, with a natural head for business or mechanics. They are not interested in subjects they see no use for, but can apply themselves when necessary. The ESTJ types like to organize and run activities, and they tend to run things well, especially if they remember to consider other's feelings and points of view. They live their outer life more with thinking, and their inner life with sensing. They are more curious about new things than new ideas, and they want ideas, plans and decisions to be based on solid fact. ESTJ types solve problems by expertly applying and adapting past experience. They prefer work where they can achieve immediate, visible, and tangible results, and have a natural inclination for business and industry, production and construction. The ESTJ types enjoy administration and getting things done in an organized way (Myers and McCaulley, 1985: 20 and 22).

ESTP

The ESTP types are matter-of -fact, do not worry or hurry, and enjoy whatever comes along. They tend to like mechanical things and sports, with friends on the side. At times they may be a bit blunt or insensitive which may be the result of their awareness of logical consequences of decisions or actions. The ESTP types can do math or science when they see a need, however they are best with real things that can be worked, handled, and taken apart or put back together. In addition, they dislike long explanations. People of this type live their outer life more with sensing, and their inner life with thinking (Myers and McCaulley, 1985: 20 and 26).

ESFP

The ESFP types are outgoing, easygoing, accepting, friendly, and fond of a good time. They like sports and enjoy making things. People of this type know what is going on and join in eagerly. They find that remembering facts is easier than mastering theories, and are best in situations that need sound common sense and practical ability with people and things. The ESFP types live their outer life with sensing and their inner life with feeling. Their feeling aspect gives them tack, sympathy, and an interest in people which results in the ability to easily handle human interactions (Myers and McCaulley, 1985: 20 and 26).

ESFJ

The ESFJ types are warm-hearted, talkative, popular, conscientious, and born cooperators. They always seem to be doing something nice for someone, and work best with plenty of encouragement and praise. People of this type have little interest in abstract thinking or technical subjects, and their main interest is in things that directly and visibly affect people's lives. They appreciate their material possessions and enjoy variety even though they can adapt easily to routines. The ENFJ types live their outer life more with feeling, and their inner life with sensing (Myers and McCaulley, 1985: 20 and 24).

ENTJ

The ENTJ types are hearty, frank, able in studies, and leaders in activities. They are usually good in anything the requires reasoning and intelligent talk. The ENTJ types are well-informed and continuously add to their knowledge. They may sometimes be more positive and confident then is warranted by their experience. People of this type live their outer life more with thinking, and their inner life with intuition. The presence of the intuition function heightens the ENTJs' intellectual interest, curiosity for new ideas, tolerance for theory, taste for complex problems, insight, vision, and concern for long range consequences. People of this psychological type are usually not content with jobs that make no demands on their intuition. The ENTJ types need problems to solve and are expert at finding new solutions. Their interest is in the broad picture - not details or facts (Myers and McCaulley, 1985: 21 and 22).

ENTP

The ENTP types are quick, ingenious, and good at many things. They are stimulating company, are alert and outspoken, and argue for fun on either side of the question. People of this type are resourceful in solving new and challenging problems, but may neglect routing assignments. The ENTPs can always find logical reasons for whatever they want, and tend to turn to one new interest after another. Their independent, analytical, and critical nature combines with their impersonal relationships with others so that they are apt to consider only how others may affect their projects and not how the projects may affect others. They live their outer life more with thinking, and their inner life with intuition (Myers and McCaulley, 1985: 21 and 28).

ENFP

The ENFP types are warmly enthusiastic, high-spirited, ingenious, and imaginative. They are able to do almost anything that interests them, and are quick with a solution for any difficulty. They are also more concerned with people and are skillful in handling them. People of this type often rely on their ability to improvise instead of completing adequate advance preparation, and they can always find compelling reasons for whatever they want. The ENFP types lead their outer lives more with feeling, and their inner lives more with intuition (Myers and McCaulley, 1985: 21 and 28).

ENFJ

The ENFJ types are responsive and responsible. They feel concern for what others think and want, and try to handle situations with due regard for other people's feelings. In addition, they are mainly interested in seeing the possibilities beyond what is present, obvious, or known. The Intuition function heightens their understanding and insight as well as their tolerance for theory. People of this type can present proposals or lead group discussions with ease and tact due to their gift of expression. They are sociable, popular, active in school affairs, but put enough time into their studies to do good work. The ENFP types live their outer life more with feeling, and their inner life more with intuition (Myers and McCaulley, 1985: 21 and 24).

ISTJ

The ISTJ types are serious, quiet, and earn success by concentration and thoroughness. They are practical, orderly, matter-of-fact, logical, realistic, and dependable. People of this type see to it that everything is well organized and like to take on responsibility. They like to make up their own minds as to what should be accomplished and work toward it steadily, regardless of distraction. In their personal relationships they may be misunderstood, so extra effort must be made in order to be appreciated. The ISTJ types live their outer life more with thinking, and their inner life more with sensing (Myers and McCaulley, 1985: 20 and 27).

ISTP

The ISTP types are cool onlookers. They are quiet and reserved, and observe and analyze life with detached curiosity and unexpected flashes of original humor. People of this type are usually interested in impersonal principles, cause and effect, or how and why mechanical things work. As a result, they can use general principles to bring order out of masses of confused data and unorganized facts They exert themselves no more than what is necessary as they are great believers in economy of effort. This is an asset if they accurately judge the amount of effort needed. However, if not accurately judged, economy of effort can become laziness. The ISTP types live their outer life more with sensing, and their inner life more with thinking (Myers and McCaulley, 1985: 20 and 23).

ISFP

The ISFP types are retiring, quietly friendly, sensitive, and modest about their abilities. They avoid disagreements and do not force their opinions or values on others. People of this type are loyal followers and do not care to lead. The ISFP types show their warmth more by deeds than words, and are compassionate toward all helpless creatures. They enjoy the present moment and may be rather lax about assignments or getting things done. However, they can pay close unbroken attention for long periods of time when required. The ISFP types live their outer life more with sensing, and their inner life more with feeling (Myers and McCaulley, 1985: 20 and 25).

ISFJ

The ISFJ types are quiet, friendly, responsible, and conscientious. They work to meet their obligations, and serve their friends and school. People of this type are thorough, painstaking, and accurate. However, they may need time to master technical subjects since their interests are not technical in nature. The ISFJ types are patient with detail and routine, and are loyal, considerate, and concerned with how other people feel. These traits make ISFJ types very supportive of people in need. As a result, they are often attracted to fields combining care for people with systematic attention to detail. They live their outer life more with feeling, and their inner life more with feeling (Myers and McCaulley, 1985: 20 and 27).

INTJ

The INTJ types have original minds and great drive which they use only for their own needs. Of all of the psychological types, this one is the most individualistic and independent. In the fields that appeal to them, they organize a job and carry through with or without help. People of this type tend to be skeptical, critical, independent, determined, and often stubborn. In addition, they tend to drive others almost a hard as they drive themselves. They must learn to yield less important points in order to win the most important one(s). The INTJ types live their outer life more with thinking, and their inner life more with intuition (Myers and McCaulley, 1985: 21 and 29).

INTP

The INTP types are quiet, reserved, and brilliant in exams - especially in theoretical or scientific subjects. They are logical to the point of hair-splitting, and are interested mainly in ideas. As a result, they are more interested in reaching solutions than in putting them into practice, which is left to others. People of this type have little liking for parties or small talk. However, they do have very sharply defined interests, and need to choose careers where some strong interest can be useful. They need to check out the attractive intuitive project against the facts and understand the limitations they impose. The INTP types live their outer life more with thinking, and their inner life more with intuition (Myers and McCaulley, 1985: 21 and 23).

INFP

The INFP types are full of enthusiasm and are loyal, but need to get to know someone well before sharing these aspects of their psychological type. They care about learning, ideas, language, and independent projects as long as the projects are related to a deep interest. In those areas for which they have a deep interest, INFP types are ingenious and persuasive, with their arguments reflecting their insight and long-range vision. People of this type tend to undertake too much, but they somehow get it done. They are friendly, but are often too absorbed in what they are doing to be sociable or notice much. The INFP types live their outer life more with intuition, and their inner life more with feeling (Myers and McCaulley, 1985: 21 and 25).

INFJ

The INFJ types succeed by perseverance, originality, and desire to do whatever is needed or wanted. They are quietly forceful, conscientious, concerned for others, and put their best efforts into their work. They are less obviously individualistic and more likely to win cooperation than to demand it. People of this type are respected for their firm principles and are likely to be honored and followed for their clear convictions as to how best to serve the common good. The INFP types live their outer life more with feeling, and their inner life more with intuition (Myers and McCaulley, 1985: 21 and 29).

Appendix B - Seating Preferences

B.1.a.

Preferred Classroom Arrangement (Extraverts, Introverts), Within Each

Significant Responses Extraverts

Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All	Semi-Circle	129	141.97	***
(N=283)	Circle	72	13.07	*
	Rows	71	12.04	*
Differentiated	Semi-Circle	111	126.05	***
(N=240)	Circle	63	13.23	*

Significant Responses Introverts

Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All	Semi-Circle	171	152.50	***
(N=412)	Rows	157	113.63	***
Differentiated	Semi-Circle	118	127.59	***
(N=261)	Rows	94	58.62	***

Significant Responses Total Undifferentiated (Es and Is)

Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Es and Is	Semi-Circle	71	46.24	***
(N=194)	Rows	76	58.97	***

Preferred Classroom Arrangement (Extraverts, Introverts), Between Each

Significant Responses Between All Extraverts and Introverts

Category	Arrangement	Chi Sq Statistic	Level of Significance
Extravert	Circle	101.85	***
Introvert	Semi-Circle	186.89	***
	Rows	113.63	***

Significant Responses Between Differentiated Extraverts and Introverts

Category	Arrangement	Chi Sq Statistic	Level of Significance
Extravert	Circle	67.94	***
Introvert	Semi-Circle	119.74	***
	Rows	61.58	***

Significant Responses Between Total Undifferentiated and Differentiated Extraverts & Introverts

Category	Arrangement	Chi Sq Statistic	Level of Significance
	Significant Undifferentiated Responses		
Undiff to Extravert	Rows	34.54	***
	Circle	81.03	***
Undiff to Intravert	Rows	85.07	***
	Significant Differentiated Responses		
Diff to Extrovert	Semi-Circle	139.04	***
Diff to Introvert	Semi-Circle	144.42	***

5 Degrees of Freedom

Test Stat	Level of Significance	Symbol
11.07	$p < .05$	*
15.09	$p < .01$	**
20.51	$p < .001$	***

Preferred Classroom Arrangement (Sensing, Intuition), Within Each

Significan Responses Sensing

Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All	Semi-Circle	181	167.70	***
(N=429)	Rows	164	119.67	***
Differentiated	Semi-Circle	147	130.39	***
(N=355)	Rows	142	115.97	***

Significant Responses **Intuition**

Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All	Semi-Circle	118	122.41	***
(N=266)	Circle	71	16.04	**
Differentiated	Semi-Circle	88	92.69	***
(N=197)				

Significant Responses **Total Undifferentiated (Ss and Ns)**

Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns	Semi-Circle	64	67.69	***
(N=143)				

Preferred Classroom Arrangement (Sensing, Intuition), Between Each

Significant Responses Between **All Intuitiors and Sensors**

Category	Arrangement	Chi Sq Statistic	Level of Significance
Intuition	Circle	113.90	***
Sensing	Semi-Circle	189.35	***
	Rows	101.63	***

Significant Responses Between **Differentiated Sensors and Intuitors**

Category	Arrangement	Chi Sq Statistic	Level of Significance
Sensing	Semi-Circle	130.39	***
	Rows	115.97	***
Intuition	----	-----	----

Significant Responses Between **Total Undifferentiated and Differentiated Sensors and Intuitors**

Significant Differentiated Responses

Category	Arrangement	Chi Sq Statistic	Level of Significance
Diff to Sensing	Semi-Circle	133.52	***
	Rows	223.14	***
Diff to Intuition	Semi-Circle	86.45	***

5 Degrees of Freedom

Test Stat	Level of Significance	Symbol
11.07	$p < .05$	*
15.09	$p < .01$	**
20.51	$p < .001$	***

Preferred Classroom Arrangement (Thinkers, Feelers), Within Each

Significant Responses Thinkers

Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All	Semi-Circle	255	261.33	***
(N=578)	Rows	195	101.06	***
Differentiated	Semi-Circle	219	226.86	***
(N=494)	Rows	173	99.84	***

Significant Responses Feelers

Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All	Semi-Circle	44	30.78	***
(N=117)	Circle	35	12.32	*
Differentiated	Semi-Circle	26	17.61	**
(N=70)				

Significant Responses Total Undifferentiated (Ts and Fs)

Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs	Semi-Circle	54	47.39	***
(N=131)				

Preferred Classroom Arrangement (Thinkers, Feelers), Between Each

Significant Responses Between All Thinkers and Feelers

Category	Arrangement	Chi Sq Statistic	Level of Significance
Thinking	Semi-Circle	216.19	***
	Rows	161.83	***
Feeling	Circle	172.29	***

Significant Responses Between Differentiated Thinkers and Feelers

Category	Arrangement	Chi Sq Statistic	Level of Significance
Thinking	Semi-Circle	182.29	***
	Rows	132.80	***
Feeling	----	-----	----

Significant Responses Between Total Undifferentiated and Differentiated Thinkers and Feelers

Significant Undifferentiated Responses

Category	Arrangement	Chi Sq Statistic	Level of Significance
Undiff to Feeling	Semi-Circle	22.89	***
Significant Differentiated Responses			
Diff to Thinking	Semi-Circle	231.76	***
	Rows	216.69	***

5 Degrees of Freedom

Test Stat	Level of Significance	Symbol
11.07	p < .05	*
15.09	p < .01	**
20.51	p <.001	***

Preferred Classroom Arrangement (Judging, Perceiving), Within Each

Significant Responses Judging				
Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All	Semi-Circle	188	174.72	***
(N=445)	Rows	157	92.51	***
Differentiated	Semi-Circle	143	153.88	***
(N=317)	Rows	105	51.51	***

Significant Responses Perceiving				
Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All	Semi-Circle	111	115.37	***
(N=250)	Rows	71	20.65	***
Differentiated	Semi-Circle	68	55.53	***
(N=170)	Rows	51	18.13	*

Significant Responses Total Undifferentiated (Js and Ps)				
Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps	Semi-Circle	88	82.05	***
(N=208)	Rows	72	40.21	***

Preferred Classroom Arrangement (Judging, Perceiving), Between Each

Significant Responses Between All Judging and Perceiving			
Category	Arrangement	Chi Sq Statistic	Level of Significance
Judging	Rows	87.39	***
Perceiving	Semi-Circle	104.57	***

Significant Responses Between Differentiated Judging and Perceiving			
Category	Arrangement	Chi Sq Statistic	Level of Significance
Judging	Semi-Circle	75.80	***
	Rows	55.40	***
Perceiving	----	-----	----

Significant Responses Between Total Undifferentiated and Differentiated Judging & Perceiving			
Significant Undifferentiated Responses			
Category	Arrangement	Chi Sq Statistic	Level of Significance
Undiff to Perceiving	Semi-Circle	43.38	***
	Rows	63.47	***
Significant Differentiated Responses			
Diff to Judging	Semi-Circle	98.95	***
	Rows	150.95	***

5 Degrees of Freedom

Test Stat	Level of Significance	Symbol
11.07	p < .05	*
15.09	p < .01	**
20.51	p <.001	***

B.1.b.

Preferred Seating In Classroom (Extraverts, Introverts), Within Each

Significant Responses **Extraverts**, (Only those responding "Row" or "Semi-Circle" Configuration)				
Category	Seating	Frequency	Chi Sq Statistic	Level of Significance
All (N=200)	Rear	74	11.52	*
Differentiated (N=169)	---		---	---

Significant Responses **Introverts**, (Only those responding "Row" or "Semi-Circle" Configuration)				
Category	Seating	Frequency	Chi Sq Statistic	Level of Significance
All	Left	114	12.49	*
(N=328)	Rear	130	28.10	***
Differentiated (N=212)	Left	80	13.75	**
Undifferentiated (N=116)	Rear	50	29.00	***

Significant Responses **Total Undifferentiated (Es and Is)**				
Category	Seating	Frequency	Chi Sq Statistic	Level of Significance
Es and Is (N=147)	Rear	72	33.81	***

Preferred Seating In Classroom (Extraverts, Introverts), Between Each

Significant Responses Between **All Extraverts and Introverts**			
Category	Seating	Chi Sq Statistic	Level of Significance
Extravert	---	---	---
Introvert	Left	108.84	***
	Rear	120.29	***

Significant Responses Between **Differentiated Extraverts and Introverts**			
Category	Seating	Chi Sq Statistic	Level of Significance
Extravert	---	---	---
Introvert	Left	57.36	***
	Rear	64.15	***

Significant Responses Between **Total Undifferentiated and Differentiated Extraverts & Introverts**			
Significant Undifferentiated Responses			
Category	Arrangement	Chi Sq Statistic	Level of Significance
Undiff to Extravert	Rear	39.18	***
Undiff to Introvert	Rear	52.17	***
Significant Differentiated Responses			
Diff to Introvert	Left	99.87	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

Preferred Seating In Classroom (Sensing and Intuition), Within Each

Significant Responses **Sensing**, (Only those responding "Row" or "Semi-Circle" Configuration)

Category	Seating	Frequency	Chi Sq Statistic	Level of Significance
All (N=345)	Rear	134	26.44	***
Differentiated (N289)	Rear	117	27.72	***

Significant Responses **Intuition**, (Only those responding "Row" or "Semi-Circle" Configuration)

Category	Seating	Frequency	Chi Sq Statistic	Level of Significance
All	Left	69	12.14	*
(N=182)	Rear	70	13.19	*
Differentiated (N=138)	Rear	53	9.92	*

Significant Responses **Total Undifferentiated (Ss and Ns)**
(Only those responding "Row" or "Semi-Circle" Configuration)

Category	Seating	Chi Sq Statistic	Level of Significance
Ss and Ns (N=100)	----	----	----

Preferred Seating In Classroom (Sensing and Intuition), Between Each

Significant Responses Between **All Sensors and Intuitors**

Category	Seating	Chi Sq Statistic	Level of Significance
Sensing	Rear	131.68	***
Intuition	Left	129.94	***

Significant Responses Between **Differentiated Sensors and Intuitors**

Category	Seating	Chi Sq Statistic	Level of Significance
Sensing	Rear	94.28	***
Intuition	---	---	---

Significant Responses Between **Total Undifferentiated and Differentiated Sensors and Intuitors**
Significant Undifferentiated Responses

Category	Seating	Chi Sq Statistic	Level of Significance
Diff to Sensing	Rear	159.70	***
Diff to Intuition	Rear	58.59	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

Preferred Seating In Classroom (Thinking and Feeling), Within Each

Significant Responses Thinkers, (Only those responding "Row" or "Semi-Circle" Configuration)				
Category	Seating	Frequency	Chi Sq Statistic	Level of Significance
All	Left	152	13.87	*
(N=450)	Rear	176	35.84	***
Differentiated	Left	129	9.81	*
(N=392)	Rear	159	37.97	***

Significant Responses Feelers, (Only those responding "Row" or "Semi-Circle" Configuration)			
Category	Seating	Chi Sq Statistic	Level of Significance
All	---	---	---
(N=77)			
Differentiated	---	---	---
(N=45)			

Significant Responses Total Undifferentiated (Ts and Fs) (Only those responding "Row" or "Semi-Circle" Configuration)			
Category	Seating	Chi Sq Statistic	Level of Significance
Ts and Fs	----	----	----
(N=90)			

Preferred Seating In Classroom (Thinking and Feeling), Between Each

Significant Responses Between All Thinkers and Feelers			
Category	Seating	Chi Sq Statistic	Level of Significance
Thinking	Left	168.58	***
	Rear	162.56	***
Feeling	---	---	---

Significant Responses Betv en Differentiated Thinkers and Feelers			
Category	Seating	Chi Sq Statistic	Level of Significance
Thinking	Left	111.77	***
	Rear	111.51	***
Feeling	----	-----	----

Significant Responses Between Total Undifferentiated and Differentiated Thinkers and Feelers Significant Differentiated Responses			
Category	Arrangement	Chi Sq Statistic	Level of Significance
Diff to Thinking	Left	118.81	***
	Rear	227.40	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

Preferred Seating In Classroom (Judging, Perceiving), Within Each

Significant Responses **Judging**, (Only those responding "Row" or "Semi-Circle" Configuration)				
Category	Seating	Frequency	Chi Sq Statistic	Level of Significance
All (N=345)	Left	121	14.00	**
	Rear	120	13.20	*
Differentiated (N=248)	Left	92	14.52	**

Significant Responses **Perceiving**, (Only those responding "Row" or "Semi-Circle" Configuration)				
Category	Seating	Frequency	Chi Sq Statistic	Level of Significance
All (N=182)	Rear	84	32.58	**
Differentiated (N=119)	Rear	55	21.43	***

Significant Responses **Total Undifferentiated (Js and Ps)** (Only those responding "Row" or "Semi-Circle" Configuration)				
Category	Seating	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps (N=160)	Rear	65	15.63	**

Preferred Seating In Classroom (Judging, Perceiving), Between Each

Significant Responses Between **All Judging and Perceiving**			
Category	Seating	Chi Sq Statistic	Level of Significance
Judging	Left	62.91	***
Perceiving	Rear	61.98	***

Significant Responses Between **Differentiated Judging and Perceiving**			
Category	Seating	Chi Sq Statistic	Level of Significance
Judging	Left	48.62	***
Perceiving	Rear	43.83	***

Significant Responses Between **Total Undifferentiated and Differentiated Judging and Perceiving**			
Significant Undifferentiated Responses			
Category	Seating	Chi Sq Statistic	Level of Significance
Undiff to Judging	Rear	69.70	***
Significant Differentiated Responses			
Diff to Judging	Left	103.26	***
Diff to Perceiving	Rear	56.12	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

B.1.c.

Arrangement Used Most (Extraverts, Introverts), Within Each

Significant Responses **Extraverts**, Arrangement Used Most				
Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All (N=283)	Rows	278	129.70	***
Differentiated (N=240)	Rows	237	970.23	***

Significant Responses **Introverts**, Arrangement Used Most				
Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All (N=412)	Rows	401	1608.40	***
Differentiated (N=261)	Rows	255	1028.30	***

Significant Responses **Total Undifferentiated (Es and Is)**, Arrangement Used Most				
Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Es and Is (N=194)	Rows	187	739.85	***

Arrangement Used Most (Sensors, Intuitors), Within Each

Significant Responses **Sensors**, Arrangement Used Most				
Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All (N=429)	Rows	419	1688.90	***
Differentiated (N=355)	Rows	348	1410.00	***

Significant Responses **Intuitors**, Arrangement Used Most				
Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All (N=266)	Rows	260	1049.15	***
Differentiated (N=197)	Rows	197	771.59	***

Significant Responses **Total Undifferentiated** (Ss and Ns), Preferred Classroom Arrangement				
Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns (N=143)	Rows	139	556.50	***

5 Degrees of Freedom

Test Stat	Level of Significance	Symbol
11.07	$p < .05$	*
15.09	$p < .01$	**
20.51	$p < .001$	***

Arrangement Used Most (Thinking, Feeling), Within Each

Significant Responses **Thinking**, Arrangement Used Most				
Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All (N=578)	Rows	568	2309.37	***
Differentiated (N=485)	Rows	485	1969.32	***

Significant Responses **Feeling**, Arrangement Used Most				
Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All (N=117)	Rows	111	429.35	***
Differentiated (N=70)	Rows	67	262.44	***

Significant Responses **Total Undifferentiated (Ts and Fs)**, Arrangement Used Most				
Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Fs and Ts (N=131)	Rows	127	506.57	***

Arrangement Used Most (Judgers, Perceivers), Within Each

Significant Responses **Judgers**, Arrangement Used Most				
Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All (N=445)	Rows	437	1755.03	***
Differentiated	Rows	317	1261.52	
*** (N=317)				

Significant Responses **Perceivers**, Arrangement Used Most				
Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
All (N=250)	Rows	242	963.20	***
Differentiated (N=170)	Rows	164	649.60	***

Significant Responses **Total Undifferentiated (Js and Ps)**, Preferred Classroom Arrangement				
Category	Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps (N=208)	Rows	204	827.13	***

5 Degrees of Freedom

Test Stat	Level of Significance	Symbol
11.07	$p < .05$	*
15.09	$p < .01$	**
20.51	$p < .001$	***

B.2.a

Preferred Classroom Arrangement (Intuition-Feeling & Sensing-Thinking)

Significant Responses all **Intuition-Feeling**

N =65

Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Semi-Circle	26	21.23	***
Circle	22	11.51	*

Significant Responses Differentiated **Intuition-Feeling**

N=31

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Significant Responses all **Sensing-Thinking**

N=377

Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Semi-Circle	163	159.68	***
Rows	144	104.85	***

Significant Responses Differentiated **Sensing-Thinking**

N=295

Semi-Circle	127	123.21	***
Rows	118	96.37	***

Preferred Classroom Arrangement (Intuition-Thinking & Sensing-Feeling)

Significant Responses all **Intuition-Thinking**

N=201

Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Semi-Circle	92	102.16	***

Significant Responses Differentiated **Intuition-Thinking**

N=107

Semi-Circle	50	58.02	***

Significant Responses all **Sensing-Feeling**

N=52

Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Semi-Circle	20	14.82	*

Significant Responses Differentiated **Sensing-Feeling**

N=26

----	----	----	----

5 Degrees of Freedom

Test Stat	Level of Significance	Symbol
11.07	$p < .05$	*
15.09	$p < .01$	**
20.51	$p < .001$	***

Preferred Classroom Arrangement Between all Intuition-Feeling & Sensing-Thinking

Intuition-Feeling Responses (as compared to Sensing-Thinking)		
Arrangement	Chi Sq Statistic	Level of Significance
Circle	127.15	***
Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Semi-Circle	149.72	***
Rows	73.49	***

Preferred Classroom Arrangement Between Differentiated Intuition-Feeling and Sensing-Thinking

Intuition-Feeling Responses (as compared to Sensing-Thinking)		
Arrangement	Chi Sq Statistic	Level of Significance
----	-----	----
Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Semi-Circle	113.08	***
Rows	55.03	***

Preferred Classroom Arrangement Between All Intuition-Thinking and Sensing-Feeling

Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Arrangement	Chi Sq Statistic	Level of Significance
Semi-Circle	23.04	***
Sensing-Feeling Responses (as compared to Intuition-Thinking)		
----	----	----

Significant Responses between Differentiated Intuition-Thinking & Sensing-Feeling

Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Arrangement	Chi Sq Statistic	Level of Significance
Semi-Circle	11.41	*
Sensing-Feeling Responses (as compared to Intuition-Thinking)		
----	-----	----

5 Degrees of Freedom

Test Stat	Level of Significance	Symbol
11.07	$p < .05$	*
15.09	$p < .01$	**
20.51	$p < .001$	***

B.2.b

Preferred Seating In Classroom (Intuition-Feeling & Sensing-Thinking)

Significant Responses all Intuition-Feeling
(Only those who answered "Row" or "Semi-Circle" for Configuration)

N=39

Seating	Frequency	Chi Sq Statistic	Level of Significance
----	----	----	----

Significant Responses Differentiated Intuition-Feeling

N=18

---	----	---	---

Significant Responses all Sensing-Thinking,
(Only those who answered "Row" or "Semi-Circle" for Configuration)

N=307

Seating	Frequency	Chi Sq Statistic	Level of Significance
Rear	123	27.87	***

Significant Responses Differentiated Sensing-Thinking

N=245

Rear	104	29.84	***

Preferred Seating In Classroom (Intuition-Thinking & Sensing-Feeling)

Significant Responses all Intuition-Thinking,
(Only those who answered "Row" or "Semi-Circle" for Configuration)

N=143

Seating	Frequency	Chi Sq Statistic	Level of Significance
Left	56	11.47	*

Significant Responses Differentiated Intuition-Thinking

N=77

----	----	----	----

Significant Responses all Sensing-Feeling
(Only those who answered "Row" or "Semi-Circle" for Configuration)

N=38

Seating	Frequency	Chi Sq Statistic	Level of Significance
----	----	----	----

Significant Responses Differentiated Sensing-Feeling

N=18

----	----	----	----

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

Preferred Seating In Classroom Between all Intuition-Feeling and Sensing-Thinking

Intuition-Feeling Responses (as compared to Sensing-Thinking) Preferred Seating In Classroom
(Only those who answered "Row" or "Semi-Circle" for Configuration)

Seating	Chi Sq Statistic	Level of Significance
----	----	----
Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Rear	132.90	***

Preferred Seating In Classroom
Between Differentiated Intuition-Feeling and Sensing-Thinking

Intuition-Feeling Responses (as compared to Sensing-Thinking)
(Only those who answered "Row" or "Semi-Circle" for Configuration)

Seating	Chi Sq Statistic	Level of Significance
---	---	---
Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Rear	65.05	***

Preferred Seating In Classroom Between all Intuition-Thinking and Sensing-Feeling

Intuition-Thinking Responses (as compared to Sensing-Feeling)
(Only those who answered "Row" or "Semi-Circle" for Configuration)

Seating	Chi Sq Statistic	Level of Significance
Left	13.81	**
Sensing-Feeling Responses (as compared to Intuition-Thinking)		
---	---	---

Preferred Seating In Classroom
Between Differentiated Intuition-Thinking and Sensing-Feeling

Intuition-Thinking Responses (as compared to Sensing-Feeling)
(Only those who answered "Row" or "Semi-Circle" for Configuration)

Seating	Chi Sq Statistic	Level of Significance
---	---	---
Sensing-Feeling Responses (as compared to Intuition-Thinking)		
---	---	---

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

B.2.c

Arrangement Used Most (Intuition-Feeling & Sensing-Thinking)

Significant Responses all Intuition-Feeling

N=65

Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Rows	60	223.14	***

Significant Responses Differentiated Intuition-Feeling

N=31

Rows	28	100.90	***

Significant Responses all Sensing-Thinking,

N=377

Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Rows	368	1482.12	***

Significant Responses Differentiated Sensing-Thinking

N=295

Rows	290	1179.68	***

Arrangement Used Most (Intuition-Thinking & Sensing-Feeling)

Significant Responses all Intuition-Thinking

N=201

Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Rows	200	827.53	***

Significant Responses Differentiated Intuition-Thinking

N=107

Rows	103	406.73	***

Significant Responses all Sensing-Feeling

N=52

Arrangement	Frequency	Chi Sq Statistic	Level of Significance
Rows	51	206.78	***

Significant Responses Differentiated Sensing-Feeling

N=26

Rows	26	108.33	***

5 Degrees of Freedom

Test Stat	Level of Significance	Symbol
11.07	$p < .05$	*
15.09	$p < .01$	**
20.51	$p < .001$	***

Appendix C - Class Preferences

C.1.a

Most Difficult Courses (Extraverts, Introverts), Within Each

Significant Responses Extraverts, Top Five Most Difficult Courses				
Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Economics	192	142.12	***
(N=1415)	Statistics	189	134.39	***
	Quant Dec Mkg	149	51.96	***
	Acct/Finance	138	36.03	**
	Computer Prog	123	18.99	---
Differentiated	Economics	160	113.25	***
(N=1200)	Statistics	260	113.25	***
	Quant Dec Mkg	134	56.96	***
	Acct/Finance	118	31.85	*
	Computer Prog	103	14.88	---
Undifferentiated (N=215)	-----	---	----	---

Significant Responses Introverts, Top Five Most Difficult Courses				
Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Statistics	287	226.92	***
(N=2060)	Economics	246	128.58	***
	Quant Dec Mkg	226	90.68	***
	Compter Prog	203	55.25	***
	Accti/Fin	200	51.27	***
Differentiated	Statistics	180	138.83	***
(N=1305)	Economics	160	90.25	***
	Quant Dec Mkg	142	55.44	***
	Computer Prog	135	44.18	***
	Acct/Finance	116	20.05	---
Undifferentiated (N=755)	Acct/Finance	84	35.29	**

Significant Responses Total Undifferentiated (Es and Is), Top Five Most Difficult Courses				
Category	Course	Frequency	Chi Sq Statistic	Level of Significance
Es and Is	Statistics	136	109.22	***
(N=970)	Economics	118	65.09	***
	Acct/Finance	104	38.62	**
	Quant Dec Mkg	99	30.83	*
	Computer Prog	88	----	----

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Most Difficult Courses (Extraverts, Introverts), Between Each

Significant Responses Between All Extraverts and Introverts

Category	Course	Chi Sq Statistic	Level of Significance
Extravert	Economics	278.64	***
Introvert	Statistics	274.11	***
	Quantitative Decision Mkg	215.88	***
	Accounting/Finance	199.90	***
	Computer Programming	177.93	***

Significant Responses Between Differentiated Extraverts and Introverts

Category	Course	Chi Sq Statistic	Level of Significance
Extravert	Economics	173.08	***
	Quantitative Decision Mkg	144.75	***
	Accounting/Finance	127.42	***
Introvert	Statistics	172.97	***
	Computer Programming	110.80	***

Significant Responses Between Total Undifferentiated and Differentiated Extraverts & Introverts

Category	Course	Chi Sq Statistic	Level of Significance
Significant Undifferentiated Responses			
Undiff to Diff Extravert	Accounting/Finance	106.99	***
Undiff to Diff Introvert	Accounting/Finance	94.83	***
Significant Differentiated Responses			
Diff to Undiff Extravert	Economics	174.13	***
	Statistics	150.92	***
	Quantitative Decision	145.37	***
Diff to Undiff Introvert	Economics	156.91	***
	Statistics	175.73	***
	Quantitative Decision	150.05	***
	Computer Programming	152.59	***

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Most Difficult Courses (Sensors, Intuitors), Within Each

Significant Responses **Sensors**, Top Five Most Difficult Courses

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Statistics	294	223.22	***
(N=2145)	Economics	277	180.29	***
	Quant Dec Mkg	237	97.34	***
	Acct/Finance	206	50.50	***
	Computer Prog	193	35.39	**
Differentiated	Statistics	250	203.00	***
(N=1775)	Economics	221	130.18	***
	Quant Dec Mkg	203	93.09	***
	Acct/Finance	169	39.95	***
	Computer Prog	164	34.01	**

Significant Responses **Intuitors**, Top Five Most Difficult Courses

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Statistics	182	137.62	***
(N=1330)	Economics	161	87.56	***
	Quant Dec Mkg	138	45.65	***
	Computer Prog	133	38.34	**
	Accot/Finance	132	36.95	*
Differentiated	Statistics	132	94.66	***
(N=985)	Economics	127	82.31	***
	Quant Dec Mkg	100	30.53	*
	Computer Prog	100	30.53	*
	Acct/Finance	100	30.53	*

Significant Responses **Total Undifferentiated** (Ss and Ns), Top Five Most Difficult Courses

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns	Statistics	94	64.15	***
(N=715)	Economics	90	54.65	***
	Computer Prog	62	----	----
	Acct/Finance	69	----	----
	Quant Dec Mkg	72	----	----

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Most Difficult Courses (Sensors, Intuitors), Between Each

Significant Responses Between All Sensors and Intuitors			
Category	Course	Chi Sq Statistic	Level of Significance
Sensors	Statistics	292.52	***
	Economics	258.59	***
	Quantitative Decision Mkg	221.50	***
	Accounting/Finance	211.92	***
Intuitors	Computer Programming	213.60	***

Significant Responses Between Differentiated Sensors and Intuitors			
Category	Course	Chi Sq Statistic	Level of Significance
Sensors	Statistics	236.82	***
	Economics	227.89	***
	Computer Programming	179.29	***
	Accounting/Finance	179.26	***
	Quantitative Decision Mkg	179.08	***
Intuitors	---	---	---

Significant Responses Between Total Undifferentiated and Differentiated Sensors and Intuitors Significant Differentiated Responses			
Category	Course	Chi Sq Statistic	Level of Significance
Diff to Undiff Sensors	Economics	216.12	***
	Statistics	265.35	***
	Computer Programming	172.26	***
	Accounting/Finance	164.25	***
	Quantitative Decision Mkg	228.07	***
Diff to Undiff Intuitors	Economics	128.71	***
	Statistics	133.17	***
	Computer Programming	115.70	***
	Accounting/Finance	103.82	***
	Quantitative Decision Mkg	99.44	***

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Most Difficult Courses (Thinkers, Feelers), Within Each

Significant Responses **Thinkers**, Top Five Most Difficult Courses

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Statistics	390	284.71	***
(N=2890)	Economics	351	192.72	***
	Quant Dec Mkg	295	91.91	***
	Acct/Finance	278	68.61	***
	Computer Prog	256	43.51	***
Differentiated	Statistics	341	263.61	***
(N=2470)	Economics	312	191.27	***
	Quant Dec Mkg	259	88.99	***
	Acct/Finance	239	60.43	***
	Computer Prog	202	38.41	**

Significant Responses **Feelers**, Top Five Most Difficult Courses

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Economics	87	80.37	***
(N=585)	Statistics	86	77.34	***
	Quant Dec Mkg	80	60.39	***
	Computer Prog	70	36.80	**
	Acct/Finance	60	19.03	---
Differentiated	Statistics	54	54.22	***
(N=350)	Economics	52	47.93	***
	Quant Dec Mkg	49	39.21	**
	Computer Prog	38	14.73	---
	Acct/Finance	38	14.73	---

Significant Responses **Total Undifferentiated (Ts and Fs)**, Top Five Most Difficult Courses

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs	Statistics	81	46.81	***
(N=655)	Economics	74	32.65	**

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Most Difficult Courses (Thinkers, Feelers), Between Each

Significant Responses Between All Thinkers and Feelers

Category	Course	Chi Sq Statistic	Level of Significance
Thinkers	Economics	428.98	***
	Statistics	423.94	***
	Quantitative Decision Mkg	394.47	***
	Accounting/Finance	345.07	***
	Computer Programming	295.47	***
Feelers	-----	-----	-----

Significant Responses Between Differentiated Thinkers and Feelers

Category	Course	Chi Sq Statistic	Level of Significance
Thinkers	Statistics	380.19	***
	Economics	366.12	***
	Quantitative Decision Mkg	345.05	***
	Computer Programming	267.35	***
	Accounting/Finance	267.28	***
Feelers	-----	-----	-----

Significant Responses Between Total Undifferentiated and Differentiated Thinkers and Feelers

Significant Differentiated Responses

Category	Course	Chi Sq Statistic	Level of Significance
Diff to Undiff Think	Economics	345.07	***
	Statistics	376.92	***
	Computer Programming	184.98	***
	Accounting/Finance	244.55	***
	Quantitative Decision Mkg	261.73	***
Diff to Undiff Feel	Economics	67.85	***
	Statistics	66.84	***
	Accounting/Finance	43.77	***
	Quantitative Decision Mkg	66.53	***

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Most Difficult Courses (Judgers, Perceivers), Within Each

Significant Responses **Judgers**, Top Five Most Difficult Courses				
Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Statistics	318	267.52	***
(N=2225)	Economics	278	165.37	***
	Quant Dec Mkg	242	94.34	***
	Acct/Finance	214	52.78	***
	Computer Prog	212	50.27	***
Differentiated	Statistics	221	175.08	***
(N=1585)	Economics	199	119.98	***
	Quant Dec Mkg	160	47.81	***
	Computer Prog	159	46.39	***
	Acct/Finance	155	40.92	***

Significant Responses **Perceivers**, Top Five Most Difficult Courses				
Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Economics	160	101.69	***
(N=1250)	Statistics	158	97.04	***
	Quant Dec Mkg	133	48.10	***
	Accot/Finance	124	34.64	**
	Computer Prog	114	22.28	---
Differentiated	Economics	111	74.42	***
(N=850)	Statistics	103	56.18	***
	Quant Dec Mkg	86	25.92	----
	Accot/Finance	86	25.92	----
	Computer Prog	78	15.68	----

Significant Responses **Total Undifferentiated (Js and Ps)**, Top Five Most Difficult Courses				
Category	Course	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps	Statistics	152	134.84	***
(N=1040)	Quant Dec Mkg	129	75.19	***
	Economics	128	72.99	***

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Most Difficult Courses (Judgers, Perceivers), Between Each

Significant Responses Between All Judgers and Perceivers

Category	Course	Chi Sq Statistic	Level of Significance
Judgers	Statistics	177.77	***
	Economics	155.16	***
	Quantitative Decision Mkg	134.98	***
	Accounting/Finance	119.19	***
	Computer Programming	118.14	***
Perceivers	-----	-----	-----

Significant Responses Between Differentiated Judgers and Perceivers

Category	Course	Chi Sq Statistic	Level of Significance
Judgers	Statistics	117.65	***
	Economics	105.68	***
	Computer Programming	84.35	***
	Quantitative Decision Mkg	84.80	***
	Accounting/Finance	82.09	***
Perceivers	-----	-----	-----

Significant Responses Between Total Undifferentiated and Differentiated Judgers and Perceivers

Significant Undifferentiated Responses

Category	Course	Chi Sq Statistic	Level of Significance
Undiff to Diff Judge	Quantitative Decision Mkg	128.59	***
Undiff to Diff Perceive	Quantitative Decision Mkg	69.33	***
	Statistics	84.58	***
	Significant Differentiated Responses		
Diff to Undiff Judge	Economics	201.48	***
	Statistics	209.31	***
	Accounting/Finance	160.99	***
	Computer Programming	184.86	***
Diff to Undiff Perceive	Economics	116.96	***

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

C.1.b
Least Difficult Courses (Extraverts, Introverts), Within Each

Significant Responses **Extraverts**, Top Five Least Difficult Courses

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Behavioral	147	48.85	***
(N=1415)	Research Meths	139	37.36	**
	Profess Writing	135	32.19	**
	Acquisition	135	32.19	**
	Contracting	110	8.61	---
Differentiated	Behavioral	132	53.42	***
(N=1200)	Research Meth	118	31.84	*
	Acquisition	116	29.12	*
	Profess Writing	114	26.70	*
	Contracting	94	7.76	---
Undifferentiated	-----	---	---	---

Significant Responses **Introverts**, Top Five Least Difficult Courses

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Behavioral	217	75.78	***
(N=2060)	Research Meth	214	71.10	***
	Profess Writing	195	44.98	***
	Acquisition	177	25.72	---
	Contracting	156	10.01	---
Differentiated	Behavioral	137	47.27	***
(N=1305)	Research Meth	129	35.54	**
	Profess Writing	123	27.85	*
	Acquisition	113	17.10	---
	Contracting	95	4.33	---
Undifferentiated	Research Meth	85	37.09	**
(N=755)				

Significant Responses **Total Undifferentiated (Es and Is)**, Top Five Least Difficult Courses

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
Es and Is	Research Meth	106	41.98	***
(N=970)				

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Least Difficult Courses (Extraverts, Introverts), Between Each

Significant Responses Between All Extraverts and Introverts

Category	Course	Chi Sq Statistic	Level of Significance
Extravert	Acquisition	195.64	***
Introvert	Behavioral	212.99	***
	Research Methods	201.30	***
	Professional Writing	195.54	***

Significant Responses Between Differentiated Extraverts and Introverts

Category	Course	Chi Sq Statistic	Level of Significance
Extravert	Behavioral	142.60	***
	Acquisition	125.25	***
Introvert	Research Methods	127.32	***
	Professinal Writing	122.98	***

Significant Responses Between Total Undifferentiated and Differentiated Extraverts and Introverts

Category	Course	Chi Sq Statistic	Level of Significance
	Significant Undifferentiated Responses		
Undiff to Diff Extravert	Research Methods	104.94	***
Undiff to Diff Introvert	Research Methods	115.34	***
	Significant Differentiated Responses		
Diff to Undiff Extravert	Acquisition	129.81	***
	Behavioral	147.02	***
	Professional Writing	111.72	***
Diff to Undiff Introvert	Professional Writing	119.57	***

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Least Difficult Courses (Sensors, Intuitors), Within Each

Significant Responses **Sensors**, Top Five Least Difficult Courses

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Research Meth	222	72.77	***
(N=2145)	Behavioral	207	51.77	***
	Acquisition	191	33.30	**
	Profess Writing	189	31.29	*
	Contracting	170	15.22	---
Differentiated	Research Meth	183	59.15	***
(N=1775)	Behavioral	169	39.95	***
	Profess Writing	167	37.52	**
	Acquisition	158	27.50	*
	Contracting	145	15.77	---

Significant Responses **Intuitors**, Top Five Least Difficult Courses

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Behavioral	157	79.30	***
(N=1330)	Profess Writing	141	50.35	***
	Research Meths	131	35.59	**
	Acquisition	121	23.38	---
	Contracting	96	4.03	---
Differentiated	Behavioral	119	64.34	***
(N=985)	Profess Writing	103	35.04	**
	Research Meth	103	35.04	**
	Acquisition	86	13.59	---
	Contracting	70	2.51	---

Significant Responses **Total Undifferentiated (Ss and Ns)**, Top Five Least Difficult Courses

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns	Behavioral	76	27.39	*
(N=715)				

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Least Difficult Courses (Sensors, Intuitors), Between Each

Significant Responses Between All Sensors and Intuitors

Category	Course	Chi Sq Statistic	Level of Significance
Sensors	Research Methods	210.22	***
	Acquisition	194.17	***
	Contracting	---	---
Intuitors	Behavioral	252.39	***
	Professional Writing	226.57	***

Significant Responses Between Differentiated Sensors and Intuitors

Category	Course	Chi Sq Statistic	Level of Significance
Sensors	Professinal Writing	184.71	***
	Research Methods	184.62	***
	Acquisition	153.96	***
	Contracting	---	---
Intuitors	Behavioral	213.65	***

Significant Responses Between Total Undifferentiated and Differentiated Sensors and Intuitors

Significant Differentiated Responses

Diff to Undiff Sensors	Acquisition	145.40	***
	Behavioral	148.90	***
	Research Methods	198.86	***
	Professional Writing	184.75	***
Diff to Undiff Intutiors	Behavioral	133.88	***
	Research Methods	113.56	***
	Professional Writing	126.97	***

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Least Difficult Courses (Thinkers, Feelers), Within Each

Significant Responses **Thinkers**, Top Five Least Difficult Courses

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Research Meth	294	90.45	***
(N=2890)	Behavioral	290	84.71	***
	Profess Writing	271	60.00	***
	Acquisition	249	36.71	**
	Computer Prog	206	7.60	---
Differentiated	Research Meth	256	84.35	***
(2470)	Behavioral	245	68.42	***
	Profess Writing	232	51.74	***
	Acquisition	220	38.41	**
	Contracting	182	9.27	---

Significant Responses **Feelers**, Top Five Least Difficult Courses

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Behavioral	73	43.27	***
(N=585)	Contracting	63	23.75	---
	Acquisition	62	22.12	---
	Profess Writing	61	20.54	---
	Research Meth	59	17.57	---
Differentiated	Behavioral	45	28.95	*
(350)	Acquisition	39	16.47	---
	Profess Writing	38	14.73	---
	Research Meth	37	13.08	---
	Contracting	36	11.54	---

Significant Responses **Total Undifferentiated (Ts and Fs)**, Top Five Least Difficult Courses

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs (N=655)	Behavioral	73	30.84	*

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Least Difficult Courses (Thinkers, Feelers), Between Each

Significant Responses Between All Thinkers and Feelers

Category	Course	Chi Sq Statistic	Level of Significance
Thinkers	Behavioral	359.83	***
	Acquisition	305.48	***
	Professional Writing	300.45	***
	Research Methods	290.46	***
	Computer Programming	---	---
Feelers	-----	-----	-----

Significant Responses Between Differentiated Thinkers and Feelers

Category	Course	Chi Sq Statistic	Level of Significance
Thinkers	Behavioral	316.80	***
	Acquisition	274.43	***
	Professional Writing	267.30	***
	Research Methods	260.13	***
	Contracting	----	---
Feelers	-----	-----	-----

Significant Responses Between Total Undifferentiated and Differentiated Thinkers and Feelers

Significant Undifferentiated Responses

Category	Course	Chi Sq Statistic	Level of Significance
Undiff to Diff Feeling	Behavioral	51.38	***
	Significant Differentiated Responses		
Diff to Undiff Think	Acquisition	243.05	***
	Behavioral	214.28	***
	Research Methods	285.88	***
	Professional Writing	226.44	***

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Least Difficult Courses (Judgers, Perceivers), Within Each

Significant Responses **Judgers**, Top Five Least Difficult Courses				
Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Research Meths	246	57.99	***
(N=2225)	Behavioral	234	51.52	***
	Profess Writing	214	31.41	*
	Acquisition	195	27.61	*
	Contracting	171	10.53	---
Differentiated	Behavioral	174	104.62	***
(N=1585)	Research Meth	169	100.42	***
	Profess Writing	160	66.54	***
	Acquisition	140	37.04	**
	Contracting	113	7.11	---

Significant Responses **Perceivers**, Top Five Least Difficult Courses				
Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Behavioral	130	43.37	***
(N=1250)	Profess Writing	118	26.90	*
	Acquisition	116	24.53	---
	Research Meth	107	15.24	---
	Contracting	95	6.27	---
Differentiated	Behavioral	90	32.00	*
(N=850)	Profess Writing	83	21.78	---
	Acquisition	79	16.82	---
	Research Meth	64	3.92	---
	Logistics Mgmt	62	2.88	---

Significant Responses **Total Undifferentiated (Js and Ps)**, Top Five Least Difficult Courses				
Category	Course	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps (N=1040)	Research Meth	120	56.56	***

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Least Difficult Courses (Judgers, Perceivers), Between Each

Significant Responses Between All Judgers and Perceivers

Category	Course	Chi Sq Statistic	Level of Significance
Judgers	Research Methods	121.60	***
	Behavioral	118.58	***
	Professional Writing	108.47	***
	Acquisition	106.22	***
	Contracting	10.53	---
Perceivers	-----	-----	-----

Significant Responses Between Differentiated Judgers and Perceivers

Category	Course	Chi Sq Statistic	Level of Significance
Judgers	Behavioral	102.09	***
	Research Methods	101.26	***
	Professional Writing	91.34	***
	Acquisition	80.55	***
	Contracting	---	---
Perceivers	-----	---	---

Significant Responses Between Total Undifferentiated and Differentiated Judgers and Perceivers

Category	Course	Chi Sq Statistic	Level of Significance
Significant Undifferentiated Responses			
Undiff to Diff Perceivers	Resear . Methods	40.95	***
Significant Differentiated Responses			
Diff to Undiff Judgers	Acquisition	138.26	***
	Behavioral	197.13	***
	Research Methods	154.65	***
	Professional Writing	187.21	***
Diff to Undiff Perceivers	Behavioral	98.29	***

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

C.2.a
Top Five Most Difficult Courses (Intuition-Feeling & Sensing-Thinking)

Course	Frequency	Chi Sq Statistic	Level of Significance
Significant Responses all Intuition-Feeling			
N=325			
Statistics	51	53.17	***
Economics	50	49.89	***
Quantitative Decision Mkg	47	40.67	***
Computer Programming	40	22.81	----
Accounting/Finance	27	.78	----
Significant Responses Differentiated Intuition-Feeling			
N=155			
Quantitative Decision Mkg	24	24.29	----
Economics	20	12.99	----
Statistics	17	6.81	----
Accounting/Finance	17	6.81	----
Logistics Management	14	.49	----

Course	Frequency	Chi Sq Statistic	Level of Significance
Significant Responses all Sensing-Thinking			
N=1885			
Statistics	259	197.86	***
Economics	240	150.35	***
Quantitative Decision Mkg	204	78.20	***
Accounting/Finance	173	34.80	**
Computer Programming	163	24.50	----
Significant Responses Differentiated Sensing-Thinking			
N=1475			
Quantitative Decision Mkg	151	47.56	***
Economics	148	43.22	***
Statistics	142	35.16	**
Accounting/Finance	126	17.74	----
Computer Programming	112	7.34	----

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Top Five Most Difficult Courses (Intuition-Thinking & Sensing-Feeling)

Significant Responses all Intuition-Thinking

N=1005

Course	Frequency	Chi Sq Statistic	Level of Significance
Statistics	131	87.40	***
Economics	111	45.53	***
Accounting/Finance	105	35.61	**
Computer Programming	93	19.42	---
Quantitative Decision Mkg	91	17.19	---

Significant Responses Differentiated Intuition-Thinking

N=535

Course	Frequency	Chi Sq Statistic	Level of Significance
Statistics	72	52.20	***
Economics	65	35.72	**
Accounting/Finance	54	16.13	----
Computer Programming	54	16.13	----
Quantitative Decision Mkg	48	8.68	----

Significant Responses all Sensing-Feeling

N=260

Course	Frequency	Chi Sq Statistic	Level of Significance
Economics	37	30.81	*
Statistics	35	25.39	----
Quantitative Decision Mkg	33	20.49	----
Accounting/Finance	33	20.49	----
Computer Programming	30	14.14	----

Significant Responses Differentiated Sensing-Feeling

N=130

Course	Frequency	Chi Sq Statistic	Level of Significance
Statistics	20	19.95	----
Economics	18	14.02	----
Quantitative Decision Mkg	17	11.44	----
Accounting/Finance	17	11.44	----
Computer Programming	15	7.07	----

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Top Five Difficult Courses Between all Intuition-Feeling and Sensing-Thinking

Course	Chi Sq Statistic	Level of Significance
Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)		
----	----	----
Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Statistics	294.57	***
Economics	189.55	***
Quantitative Decision Mkg	271.85	***
Accounting/Finance	155.50	**
Computer Programming	----	----

Top Five Difficult Courses Between Differentiated Intuition-Feel and Sensing-Think

Course	Chi Sq Statistic	Level of Significance
Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)		
---	---	---
Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Quantitative Decision Mkg	227.73	***
Economics	189.54	***
Statistics	160.90	**
Accounting/Finance	----	----
Computer Programming	----	----

Top Five Difficult Courses Between all Intuition-Thinking and Sensing-Feeling

Course	Chi Sq Statistic	Level of Significance
Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Statistics	32.86	**
Economics	27.42	*
Accounting/Finance	----	----
Computer Programming	----	----
Quantitative Decision Making	----	----
Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)		
----	----	----

Top Five Difficult Courses Between Differentiated Intuition-Think and Sensing-Feel

Course	Chi Sq Statistic	Level of Significance
Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Statistics	----	----
Economics	----	----
Computer Programming	----	----
Accounting/Finance	----	----
Quantitative Decision Mkg	----	----
Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)		
---	---	---

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

C.2.b.
Top Five Least Difficult Courses (Intuition-Feeling & Sensing-Thinking)

Significant Responses all Intuition-Feeling
N=325

Course	Frequency	Chi Sq Statistic	Level of Significance
Behavioral	45	35.04	**
Professional Writing	37	16.73	---
Acquisition	37	16.73	---
Contracting	34	11.58	---
Research Methods	31	7.39	---

Significant Responses Differentiated **Intuition-Feeling**
N=155

Course	Frequency	Chi Sq Statistic	Level of Significance
Acquisition	24	24.29	---
Cost Analysis	19	10.71	---
Research Methods	15	3.80	---
Behavioral	14	2.61	---
Professional Writing	14	2.61	---

Significant Responses all **Sensing-Thinking**
N=1885

Course	Frequency	Chi Sq Statistic	Level of Significance
Research Methods	194	62.31	***
Behavioral	179	41.85	***
Acquisition	166	27.40	*
Professional Writing	165	26.41	*
Computer Programming	143	9.30	---

Significant Responses Differentiated **Sensing-Thinking**

Course	Frequency	Chi Sq Statistic	Level of Significance
Research Methods	154	52.10	***
Acquisition	141	33.90	**
Cost Analysis	137	29.09	*
Professional Writing	125	15.13	---
Computer Programming	115	9.85	---

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Top Five Least Difficult Courses (Intuition-Thinking & Sensing-Feeling)

Significant Responses all **Intuition-Thinking**

N=1005

Course	Frequency	Chi Sq Statistic	Level of Significance
Behavioral	112	47.30	***
Professional Writing	104	34.07	**
Research Methods	100	28.27	*
Acquisition	84	10.47	---
Statistics	69	1.65	---

Significant Responses Differentiated **Intuition-Thinking**

N=535

Course	Frequency	Chi Sq Statistic	Level of Significance
Behavioral	60	25.86	---
Research Methods	57	20.71	---
Professional Writing	56	19.12	---
Acquisition	45	5.82	---
Statistics	39	.97	---

Significant Responses all **Sensing-Feeling**

N=260

Course	Frequency	Chi Sq Statistic	Level of Significance
Contracting	29	12.28	---
Behavioral	28	10.56	---
Research Methods	28	10.56	---
Acquisition	25	6.16	---
Professional Writing	24	4.96	---

Significant Responses Differentiated **Sensing-Feeling**

N=130

Course	Frequency	Chi Sq Statistic	Level of Significance
Contracting	17	11.44	---
Research Methods	16	9.12	---
Acquisition	15	7.07	---
Professional Writing	14	5.28	---
Behavioral	11	1.47	---

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.2[illegible]5	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Top Five Least Difficult Courses Between all Intuition-Feeling & Sensing-Thinking

Course	Chi Sq Statistic	Level of Significance
	Intuition-Feeling Responses (as compared to Sensing-Thinking)	
----	----	----
	Sensing-Thinking Responses (as compared to Intuition-Feeling)	
Research Methods	51.32	***
Behavioral	45.62	***
Acquisition	45.97	***
Professional Writing	33.68	**
Computer Programming	----	---

Top Five Least Difficult Courses Between Differentiated Intuition-Feeling and Sensing-Thinking

Course	Chi Sq Statistic	Level of Significance
	Intuition-Feeling Responses (as compared to Sensing-Thinking)	
----	----	----
	Sensing-Thinking Responses (as compared to Intuition-Feeling)	
Acquisition	37.28	**
Research Methods	27.32	*
Cost Analysis	----	---
Professional Writing	----	---
Computer Programming	----	---

Top Five Least Difficult Courses Between all Intuition-Thinking & Sensing-Feeling

Course	Chi Sq Statistic	Level of Significance
	Intuition-Thinking Responses (as compared to Sensing-Feeling)	
Behavioral	28.00	*
Professional Writing	----	----
Research Methods	----	----
Acquisition	----	----
Statistics	----	----
	Sensing-Feeling Responses (as compared to Intuition-Thinking)	
Contracting	---	---

Top Five Least Difficult Courses Between Differentiated Intuition-Thinking and Sensing-Feeling

Course	Chi Sq Statistic	Level of Significance
	Intuition-Thinking Responses (as compared to Sensing-Feeling)	
Behavioral	----	----
Professional Writing	----	----
Research Methods	----	----
Statistics	----	----
	Sensing-Feeling Responses (as compared to Intuition-Thinking)	
Acquisition	----	----
Contracting	----	----

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Appendix D - Study Strategies

D.1.a.

Courses with Study Groups (Extraverts, Introverts), Within Each

Significant Responses **Extraverts**, Top Five Courses Most Used Study Group

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Did Not Use	332	743.48	***
(N=1083)	Statistics	209	331.37	***
	Quant Dec Mkg	137	84.33	***
	Computer Prog	117	44.58	***
	Economics	106	28.08	**
Differentiated	Did Not Use	271	569.00	***
(N=929)	Statistics	181	172.70	***
	Quant Dec Mkg	123	38.91	**
	Computer Prog	99	11.43	---
	Economics	96	9.15	---

Significant Responses **Introverts**, Top Five Courses Most Used Study Group

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Did Not Use	638	2204.30	***
(N=1422)	Statistics	284	479.00	***
	Quant Dec Mkg	189	132.69	***
	Computer Prog	165	79.12	***
	Economics	127	22.47	---
Differentiated	Did Not Use	366	1089.80	***
(N=939)	Statistics	191	333.70	***
	Quant Dec Mkg	132	106.69	***
	Computer Prog	107	48.51	***
	Economics	85	16.04	---

Significant Responses **Total Undifferentiated (Es and Is)**, Top Five Courses Most Used Study Group

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
Es and Is	Did Not Use	333	1334.47	***
(N=637)	Statistics	121	71.65	***
	Quant Dec Mkg	76	39.62	***
	Comp Program	71	30.00	*

15 Degrees of Freedom

Test Stat	Level of Significance	Symbol
24.996	$p < .05$	*
30.578	$p < .01$	**
37.700	$p < .001$	***

Courses with Study Groups (Extraverts, Introverts), Between Each

Significant Responses Between All Extraverts and Introverts

Category	Course	Chi Sq Statistic	Level of Significance
Extravert	-----	---	---
Introvert	Did Not Use Groups	482.02	***
	Statistics	303.34	***
	Quantitative Decision Mkg	198.50	***

Significant Responses Between Differentiated Extraverts and Introverts

Category	Course	Chi Sq Statistic	Level of Significance
Extravert	Statistics	195.87	***
Introvert	Did Not Use Groups	293.47	***
	Quantitative Decision Mkg	132.78	***

Significant Responses Between Total Undifferentiated and Differentiated Extraverts and Introverts

Significant Undifferentiated Responses

Category	Course	Chi Sq Statistic	Level of Significance
Undiff to Diff Extravert	Did Not Use Groups	177.04	***
Undiff to Diff Introvert	Did Not Use Groups	297.66	***

Significant Differentiated Responses

Category	Course	Chi Sq Statistic	Level of Significance
Diff to Undiff Extravert	Statistics	217.62	***
	Quantitative Decision Mkg	171.05	***
Diff to Undiff Introvert	Statistics	222.76	***
	Quantitative Decision Mkg	181.07	***

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Courses with Study Groups (Sensing, Intuition), Within Each

Significant Responses **Sensing**, Top Five Courses Most Used Study Group

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Did Not Use	610	1855.20	***
(N=1535)	Statistics	302	496.37	***
	Quant Dec Mkg	204	143.19	***
	Computer Prog	175	79.46	***
	Economics	135	22.13	---
Differentiated	Did Not Use	530	1734.72	***
(N=1245)	Statistics	247	412.29	***
	Quant Dec Mkg	159	100.43	***
	Computer Prog	145	70.32	***
	Economics	109	17.47	---

Significant Responses **Intuition**, Top Five Courses Most Used Study Group

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Did Not Use	360	1014.78	***
(N=625)	Statistics	191	314.42	***
	Quant Dec Mkg	122	195.72	***
	Computer Prog	107	171.55	***
	Economics	98	29.38	*
Differentiated	Did Not Use	272	790.82	***
(N=713)	Statistics	141	233.96	***
	Quant Dec Mkg	90	55.07	***
	Computer Prog	80	34.54	**
	Economics	73	23.00	---

Significant Responses **Total Undifferentiated (Ss and Ns)**, Top Five Courses Most Used Study Group

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns	Did Not Use	168	377.12	***
(N=547)	Statistics	105	164.82	***
	Quant Dec Mkg	77	62.44	***

15 Degrees of Freedom

Test Stat	Level of Significance	Symbol
24.996	$p < .05$	*
30.578	$p < .01$	**
37.700	$p < .001$	***

Courses with Study Groups (Sensing, Intuition), Between Each

Significant Responses Between All Sensing and Intuition

Category	Course	Chi Sq Statistic	Level of Significance
Sensing	Did Not Use Groups	579.55	***
	Statistics	307.06	***
	Quantitative Decision Mkg	195.72	***
	Computer Programming	----	----
Intuition	Economics	----	----

Significant Responses Between Differentiated Sensing and Sensing

Category	Course	Chi Sq Statistic	Level of Significance
Sensing	Did Not Use Groups	489.07	***
	Statistics	253.11	***
	Quantitative Decision Mkg	161.20	***
	Computer Programming	----	----
Intuition	Economics	----	----

Significant Responses Between Total Undifferentiated and Differentiated Sensing and Intuition

Significant Undifferentiated Responses

Category	Course	Chi Sq Statistic	Level of Significance
Undiff to Diff Sensing	Did Not Use Groups	129.77	***
Undiff to Diff Intuition	Quantitative Decision Mkg	74.98	***
	Significant Differentiated Responses		
Diff to Undiff Sensing	Did Not Use Groups	671.04	***
	Statistics	231.57	***
Diff to Undiff Intuition	Did Not Use Groups	318.28	***
	Statistics	136.06	***

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Courses with Study Groups (Thinking, Feeling), Within Each

Significant Responses **Thinking**, Top Five Courses Most Used Study Group

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Did Not Use	825	2523.68	***
(N=2065)	Statistics	407	671.17	***
	Quant Dec Mkg	260	157.98	***
	Computer Prog	238	111.79	***
	Economics	190	38.66	***
Differentiated	Did Not Use	708	2179.29	***
(N=2470)	Statistics	346	566.68	***
	Quant Dec Mkg	218	126.16	***
	Computer Prog	205	99.11	***
	Economics	166	37.51	**
Undifferentiated	Quant Dec Mkg	42	79.41	***
(N=420)	Computer Prog	33	27.98	*

Significant Responses **Feeling**, Top Five Courses Most Used Study Group

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Did Not Use	141	330.15	***
(N=444)	Statistics	86	137.00	***
	Quant Dec Mkg	66	60.90	***
	Computer Prog	44	12.24	---
	Economics	43	10.91	---
Differentiated	Did Not Use	86	207.82	***
(N=274)	Statistics	50	76.51	***
	QuantDec Mkg	39	35.47	**
	Economics	28	10.01	---
	Computer Prog	26	7.06	---

Significant Responses **Total Undifferentiated (Ts and Fs)**, Top Five Courses Most Used Study Group

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs	Did Not Use	172	462.36	***
	Statistics	97	165.58	***
	Quant Dec Mkg	77	57.98	***

15 Degrees of Freedom

Test Stat	Level of Significance	Symbol
24.996	$p < .05$	*
30.578	$p < .01$	**
37.700	$p < .001$	***

Courses with Study Groups (Thinking, Feeling), Between Each

Significant Responses Between All Thinking and Feeling			
Category	Course	Chi Sq Statistic	Level of Significance
Thinking	Did Not Use Groups	695.38	***
	Statistics	423.90	***
	Quantitative Decision Mkg	325.25	***
	Computer Programming	216.27	***
	Economics	----	----
Feeling	---	----	----

Significant Responses Between Differentiated Feeling and Thinking			
Category	Course	Chi Sq Statistic	Level of Significance
Thinking	Did Not Use Groups	605.75	***
	Statistics	351.88	***
	Quantitative Decision Mkg	274.44	***
	Computer Programming	----	----
	Economics	----	----
Feeling	----	----	----

Significant Responses Between Total Undifferentiated and Differentiated Thinking and Feeling			
	Significant Undifferentiated Responses		
Category	Course	Chi Sq Statistic	Level of Significance
Undiff to Diff Thinking	Did Not Use Groups	769.06	***
Undiff to Diff Feeling	Did Not Use Groups	79.94	***
	Statistics	47.70	***
	Significant Differentiated Responses		
Diff to Undiff Thinking	Statistics	323.51	***
	Quantitative Decision Mkg	178.87	***

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

Courses with Study Groups (Judging, Perceiving), Within Each

Significant Responses **Judging**, Top Five Courses Most Used Study Group

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Did Not Use	655	1014.78	***
(N=1570)	Statistics	308	503.54	***
	Quant Dec Mkg	202	130.18	***
	Computer Prog	181	85.09	***
	Economics	134	18.78	---
Differentiated	Did Not Use	444	790.82	***
(N=1141)	Statistics	217	335.26	***
	Quant Dec Mkg	143	86.00	***
	Computer Prog	138	75.04	***
	Economics	96	12.49	---

Significant Responses **Perceiving**, Top Five Courses Most Used Study Group

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
All	Did Not Use	314	786.44	***
(N=936)	Statistics	185	168.99	***
	Quant DecMkg	124	34.64	**
	Computer Prog	101	10.26	---
	Economics	99	8.82	---
Differentiated	Did Not Use	242	737.28	***
(N=608)	Statistics	123	212.78	***
	Quant Dec Mkg	84	65.05	***
	Computer Prog	70	32.77	**
	Economics	57	12.61	---

Significant Responses **Total Undifferentiated (Js and Ps)**, Top Five Courses Most Used Study Group

Category	Course	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps	Did Not Use	282	797.09	***
(N=758)	Statistics	153	263.59	***
	Quant Dec Mkg	99	66.40	***
	Economics	80	28.12	*

15 Degrees of Freedom

Test Stat	Level of Significance	Symbol
24.996	$p < .05$	*
30.578	$p < .01$	**
37.700	$p < .001$	***

Courses with Study Groups (Judging, Perceiving), Between Each

Significant Responses Between All Judging and Perceiving

Category	Course	Chi Sq Statistic	Level of Significance
Judging	Economics	----	----
	Did Not Use Groups	367.12	***
Perceiving	Statistics	171.96	***
	Quantitative Decision Mkg	112.39	***
	Computer Programming	----	----

Significant Responses Between Differentiated Judging and Perceiving

Category	Course	Chi Sq Statistic	Level of Significance
Judging	Economics	----	----
	Did Not Use Groups	237.63	***
Perceiving	Statistics	115.32	***
	Quantitative Decision Mkg	75.59	***
	Computer Programming	----	----

Significant Responses Between Total Undifferentiated and Differentiated Judging and Perceiving

Significant Undifferentiated Responses

Category	Course	Chi Sq Statistic	Level of Significance
Undiff to Diff Perceive	Statistics	120.17	***
Significant Differentiated Responses			
Diff to Undiff Judge	Did Not Use Groups	459.24	***
	Statistics	200.42	***
Diff to Undiff Perceive	Did Not Use Groups	253.28	***

16 Degrees of Freedom

Test Stat	Level of Significance	Symbol
26.296	$p < .05$	*
32.000	$p < .01$	**
39.252	$p < .001$	***

D.1.b.

Number In Study Groups (Extraverts, Introverts), Within Each

Significant Responses **Extraverts**, Top Five Number in Study Group

Category	Number	Frequency	Chi Sq Statistic	Level of Significance
All	0	383	1569.10	***
(N=1032)	3	243	818.53	***
	4	224	667.56	***
	2	187	417.70	***
	5	119	110.54	**
Differentiated	0	322	1311.42	***
(N=878)	3	210	724.92	***
	4	189	556.97	***
	2	161	367.41	***
	5	110	123.10	***

Significant Responses **Introverts**, Top Five Number in Study Group

Category	Number	Frequency	Chi Sq Statistic	Level of Significance
All	0	694	3849.30	***
(N=1366)	3	315	523.32	***
	2	243	238.26	***
	4	234	210.41	***
	1	143	26.02	----
Differentiated	0	398	1933.70	***
(N=907)	3	295	573.55	***
	2	169	396.00	***
	4	162	353.80	***
	1	95	70.14	***

Significant Responses **Total Undifferentiated (Es and Is)**, Top Five Number in Study Group

Category	Number	Frequency	Chi Sq Statistic	Level of Significance
Es and Is	0	356	2206.52	***
(N=614)	3	253	560.67	***
	4	107	224.13	***
	2	100	186.22	***

20 Degrees of Freedom

Test Stat	Level of Significance	Symbol
31.41	$p < .05$	*
37.57	$p < .01$	**
45.32	$p < .001$	***

Number In Study Groups (Extraverts, Introverts), Between Each

Significant Responses Between All Extraverts and Introverts			
Category	Number	Chi Sq Statistic	Level of Significance
Extravert	4	325.39	***
	5	83.79	***
Introvert	0	554.88	***
	3	352.88	***
	2	271.35	***

Significant Responses Between **Differentiated Extraverts and Introverts**			
Category	Number	Chi Sq Statistic	Level of Significance
Extravert	2	174.12	***
	3	227.52	***
	4	204.75	***
	5	118.86	***
Introvert	0	349.04	***

Significant Responses Between **Total Undifferentiated and Differentiated Extraverts and Introverts**			
	Significant Undifferentiated Responses		
Category	Number	Chi Sq Statistic	Level of Significance
Undiff to Extravert	0	234.19	***
Undiff to Introvert	0	329.39	***
	Significant Differentiated Responses		
Diff to Extravert	2	208.29	***
	3	231.75	***
	4	268.62	***
	5	186.86	***
Diff to Introvert	2	210.95	***
	3	183.39	***
	4	180.96	***

21 Degrees of Freedom

Test Stat	Level of Significance	Symbol
32.67	$p < .05$	*
38.93	$p < .01$	**
46.80	$p < .001$	***

Number In Study Groups (Intuition, Sensing), Within Each

Significant Responses **Sensing**, Top Five Number in Study Group

Category	Number	Frequency	Chi Sq Statistic	Level of Significance
All	0	677	3444.30	***
(N=1468)	3	356	3587.50	***
	4	287	2230.75	***
	2	258	1756.27	***
	1	158	388.02	***
Differentiated	0	578	3065.44	***
(N=1197)	3	297	2020.76	***
	4	226	1076.43	***
	2	208	883.88	***
	1	12	146.72	***

Significant Responses **Intuition**, Top Five Number in Study Group

Category	Number	Frequency	Chi Sq Statistic	Level of Significance
All	0	399	1895.86	***
(N=931)	3	202	602.54	***
	2	172	397.40	***
	4	171	391.20	***
	1	112	114.74	***
Differentiated	0	292	1365.15	***
(N=693)	3	143	194.59	***
	2	129	141.88	***
	4	124	125.07	***
	1	83	27.19	---

Significant Responses **Total Undifferentiated (Ss and Ns)**, Top Five Number in Study Group

Category	Number	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns	0	206	926.22	***
(N=509)	3	118	112..62	***
	4	108	224.93	***
	2	93	175.39	***

20 Degrees of Freedom

Test Stat	Level of Significance	Symbol
31.41	$p < .05$	*
37.57	$p < .01$	**
45.32	$p < .001$	***

Number In Study Groups (Intuition, Sensing), Between Each

Significant Responses Between All Intuition and Sensing			
Category	Number	Chi Sq Statistic	Level of Significance
Intuition	1	179.87	***
Sensing	0	642.45	***
	3	324.69	***
	2	276.47	***
	4	274.75	***

Significant Responses Between Differentiated Intuition and Sensing			
Category	Number	Chi Sq Statistic	Level of Significance
Intuition	1	----	----
Sensing	0	525.09	***
	3	256.54	***
	2	231.57	***
	4	222.44	***

Significant Responses Between Total Undifferentiated and Differentiated Intuition and Sensing			
	Significant Undifferentiated Responses		
Category	Number	Chi Sq Statistic	Level of Significance
Undiff to Intuition	3	124.41	***
	4	101.97	***
	Significant Differentiated Responses		
Diff to Intuition	0	299.07	***
	2	128.51	***
	1	80.60	***
Diff to Sensing	0	650.79	***
	2	184.91	***
	3	298.64	***
	4	188.02	***

21 Degrees of Freedom

Test Stat	Level of Significance	Symbol
32.67	$p < .05$	*
38.93	$p < .01$	**
46.80	$p < .001$	***

Number In Study Groups (Thinking, Feeling), Within Each

Significant Responses **Thinking**, Top Five Number in Study Group

Category	Number	Frequency	Chi Sq Statistic	Level of Significance
All	0	909	4603.39	***
(N=1981)	3	461	1528.20	***
	4	382	946.60	***
	2	364	833.48	***
	5	216	176.18	***
Differentiated	0	754	3667.98	***
(N=1716)	3	404	1362.51	***
	4	333	833.65	***
	2	301	637.55	***
	1	196	178.51	***

Significant Responses **Feeling**, Top Five Number in Study Group

Category	Number	Frequency	Chi Sq Statistic	Level of Significance
All	0	168	752.01	***
(N=417)	3	97	321.35	***
	4	76	171.68	***
	2	66	116.77	***
	1	38	19.14	---
Differentiated	0	108	533.07	***
(N=242)	3	51	145.45	***
	4	43	93.09	***
	2	35	52.36	***
	5	26	20.45	---
Undifferentiated	4	33	46.63	***
(N=235)	2	31	38.65	**

Significant Responses **Total Undifferentiated (Ts and Fs)**, Top Five Number in Study Group

Category	Number	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs	0	215	1152.37	***
(N=440)	2	103	344.45	***
	3	94	273.80	***
	4	82	192.20	***

20 Degrees of Freedom

Test Stat	Level of Significance	Symbol
31.41	$p < .05$	*
37.57	$p < .01$	**
45.32	$p < .001$	***

Number In Study Groups (Thinking, Feeling), Between Each

Significant Responses Between All Thinking and Feeling

Category	Number	Chi Sq Statistic	Level of Significance
Thinking	3	478.23	***
	4	374.44	***
	2	324.93	***
	5	181.60	***
Feeling	0	828.85	***

Significant Responses Between Differentiated Thinking and Feeling

Category	Number	Chi Sq Statistic	Level of Significance
Thinking	3	358.79	***
	4	302.36	***
	2	245.78	***
	1	168.21	***
Feeling	0	761.18	***

Significant Responses Between Total Undifferentiated and Differentiated Thinking and Feeling

Significant Undifferentiated Responses

Category	Number	Chi Sq Statistic	Level of Significance
Undiff to Feeling	0	100.99	***
	3	46.72	**
	4	41.66	**
	Significant Differentiated Responses		
Diff to Thinking	0	697.44	***
	1	347.51	***
	2	251.82	***
	3	416.44	***
	4	354.84	***

21 Degrees of Freedom

Test Stat	Level of Significance	Symbol
32.67	$p < .05$	*
38.93	$p < .01$	**
46.80	$p < .001$	***

Number In Study Groups (Judging, Perceiving), Within Each

Significant Responses **Judging**, Top Five Number in Study Group				
Category	Number	Frequency	Chi Sq Statistic	Level of Significance
All	0	723	3823.69	***
(N=1502)	3	358	1229.51	***
	4	278	644.26	***
	2	277	638.13	***
	5	163	131.43	***
Differentiated	0	492	2447.92	***
(N=1093)	3	255	848.51	***
	4	212	530.32	***
	2	209	510.90	***
	1	125	114.18	*

Significant Responses **Perceiving**, Top Five Number in Study Group				
Category	Number	Frequency	Chi Sq Statistic	Level of Significance
All	0	352	1533.53	***
(N=898)	3	200	360.82	***
	4	180	267.06	***
	2	153	162.82	***
	1	95	25.65	----
Differentiated	0	280	1507.81	***
(N=570)	3	124	188.60	***
	4	115	150.93	***
	2	101	100.66	***
	5	72	28.81	----

Significant Responses **Total Undifferentiated (Js and Ps)**, Top Five Number in Study Group				
Category	Number	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps	0	303	1383.39	***
(N=737)	2	179	111.89	***
	3	131	367.06	***
	4	120	148.29	***

20 Degrees of Freedom

Test Stat	Level of Significance	Symbol
31.41	$p < .05$	*
37.57	$p < .01$	**
45.32	$p < .001$	***

Number In Study Groups (Judging, Perceiving), Between Each

Significant Responses Between All Judging and Perceiving

Category	Number	Chi Sq Statistic	Level of Significance
Perceiving	----	----	----
Judging	0	405.31	***
	3	200.13	***
	4	155.02	***
	2	154.63	***
	5	90.59	***

Significant Responses Between Differentiated Judging and Perceiving

Category	Number	Chi Sq Statistic	Level of Significance
Perceiving	----	----	----
Judging	0	262.79	
	3	135.84	
	4	112.67	***
	2	111.18	***
	1	66.02	***

Significant Responses Between Total Undifferentiated and Differentiated Judging and Perceiving

Significant Undifferentiated Responses

Category	Number	Chi Sq Statistic	Level of Significance
Undiff to Perceive	2	103.19	***
		Significant Differentiated Responses	
Diff to Judging	0	522.67	***
	1	181.55	***
	2	237.32	***
	3	236.83	***
	4	223.59	***
Diff to Perceiving	0	315.77	***
	3	104.28	***
	4	122.70	***

21 Degrees of Freedom

Test Stat	Level of Significance	Symbol
32.67	p < .05	*
38.93	p < .01	**
46.80	p <.001	***

D.1.c

Objectives for Course Disliked Extraverts, Introverts), Within Each

Significant Responses **Extraverts**, Objectives for Course Disliked				
Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All (N=283)	Gain Under	177	159.56	***
Differentiated (N=240)	Gain Under	146	123.27	***

Significant Responses **Introverts**, Objectives for Course Disliked				
Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All	Gain Under	228	151.70	***
(N=412)	Enough Pass	141	14.01	**
Differentiated (N=261)	Gain Under	143	92.64	***
Undifferentiated (N=151)	Enough Pass	85	59.14	***

Significant Responses **Total Undifferentiated (Es and Is)**, Objectives for Course Disliked				
Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
Es and Is (N=194)	Gain Under	116	93.94	***

Objectives for Course Disliked (Extraverts, Introverts), Between Each

Significant Responses Between **All Extraverts and Introverts**			
Category	Objective	Chi Sq Statistic	Level of Significance
Extravert	Gain Understanding	256.8	***
Introvert	Enough to Pass	115.25	***

Significant Responses Between **Differentiated Extraverts and Introverts**			
Category	Objective	Chi Sq Statistic	Level of Significance
Extravert	Gain Understanding	157.87	***
Introvert	Enough to Pass	77.21	***

Significant Responses Between **Total Undifferentiated and Differentiated Extraverts and Introverts** Significant Differentiated Responses			
Category	Objective	Chi Sq Statistic	Level of Significance
Diff to Extravert	Gain Understanding	147.50	***
Diff to Introvert	Gain Understanding	129.69	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

Objectives for Course Disliked (Sensing, Intuition), Within Each

Significant Responses **Sensing**, Objectives for Course Disliked

Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All	Gain Under	251	192.67	***
(N=429)	Enough Pass	149	16.25	**
Differentiated	Gain Under	203	147.08	***
(N=355)	Enough Pass	128	17.36	***

Significant Responses **Intuition**, Objectives for Course Disliked

Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All (N=266)	Gain Under	154	115.13	***
Differentiated (N=197)	Gain Under	115	87.78	***

Significant Responses **Total Undifferentiated** (**Ss and Ns**), Objectives for Course Disliked

Category	Objective	Chi Sq Statistic	Level of Significance
Ss and Ns	Gain Understanding	73.47	***

Objectives for Course Disliked (Sensing, Intuition), Between Each

Significant Responses Between **All Sensing and Intuition**

Category	Objective	Chi Sq Statistic	Level of Significance
Sensing	Gain Understanding	247.36	***
	Enough to Pass	114.84	***
Intuition	----	---	-----

Significant Responses Between **Differentiated Sensing and Intuition**

Category	Objective	Chi Sq Statistic	Level of Significance
Sensing	Gain Understanding	206.25	***
	Enough to Pass	86.85	***
Intuition	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Sensing and Intuition**

Significant Differentiated Responses

Category	Objective	Chi Sq Statistic	Level of Significance
Diff to Sensing	Gain Understanding	188.32	***
Diff to Intuition	Gain Understanding	108.97	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

Objectives for Course Disliked (Thinking,Feeling), Within Each

Significant Responses **Thinking**, Objectives for Course Disliked

Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All (N=578)	Gain Under	346	280.98	***
Differentiated (N=494)	Gain Under	176	243.74	***

Significant Responses **Feeling**, Objectives for Course Disliked

Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All	Gain Under	59	30.26	***
(N=117)	Enough Pass	45	8.48	*
Differentiated (N=70)	Gain Under	36	19.56	***

Significant Responses **Total Undifferentiated (Ts and Fs)**, Objectives for Course Disliked

Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs (N=131)	Gain Under	247	47.04	***

Objectives for Course Disliked (Thinking, Feeling), Between Each

Significant Responses Between **All Thinking and Feeling**

Category	Objective	Chi Sq Statistic	Level of Significance
Thinking	Gain Understanding	290.28	***
Feeling	Enough to Pass	221.52	***

Significant Responses Between **Differentiated Thinking and Feeling**

Category	Objective	Chi Sq Statistic	Level of Significance
Thinking	Gain Understanding	252.89	***
Feeling	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Thinking and Feeling**

Significant Differentiated Responses

Category	Objective	Chi Sq Statistic	Level of Significance
Diff to Thinking	Gain Understanding	321.11	***
Diff to Feeling	Gain Understanding	33.55	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

Objectives for Course Disliked (Judging, Perceiving), Within Each

Significant Responses **Judging**, Objectives for Course Disliked

Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All (N=445)	Gain Under	266	215.26	***
Differentiated (N=317)	Gain Under	187	146.50	***
Undifferentiated (N=128)	-----	---	---	---

Significant Responses **Perceiving**, Objectives for Course Disliked

Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All	Gain Under	139	93.64	***
(N=250)	Enough Pass	92	13.92	**
Differentiated (N=170)	Gain Under	97	69.89	***
Undifferentiated (N=80)	Enough Pass	34	9.80	*

Significant Responses **Total Undifferentiated (Js and Ps)**, Objectives for Course Disliked

Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps (N=208)	Gain Under	130	91.56	***

Objectives for Course Disliked (Judging, Perceiving), Between Each

Significant Responses Between **All Judging and Perceiving**

Category	Objective	Chi Sq Statistic	Level of Significance
Judging	Gain Understanding	148.51	***
Perceiving	Enough to Pass	71.20	***

Significant Responses Between **Differentiated Judging and Perceiving**

Category	Objective	Chi Sq Statistic	Level of Significance
Judging	Gain Understanding	99.32	***
Perceiving	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Judging and Perceiving**

Category	Objective	Chi Sq Statistic	Level of Significance
Significant Undifferentiated Responses			
Undiff to Perceive	Gain Understanding	94.32	***
Significant Differentiated Responses			
Diff to Judging	Gain Understanding	188.10	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

D.1.d.

Objectives for Course Liked (Extraverts, Introverts), Within Each

Significant Responses **Extraverts**, Objectives for Course Liked

Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All (N=283)	Master Subj	203	247.21	***
Differentiated (N=240)	Master Subj	172	209.07	***
Undifferentiated (N=43)	-----	---	---	---

Significant Responses **Introverts**, Objectives for Course Liked

Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All	Master Subj	267	261.13	***
(N=412)	Gain Under	136	10.57	*
Differentiated (N=261)	Master Subj	173	177.93	***
Undifferentiated (N=151)	Gain Under	54	83.82	***

Significant Responses **Total Undifferentiated (Es and Is)**, Objectives for Course Liked

Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
Es and Is (N=194)	Master Subj	125	120.66	***

Objectives for Course Liked (Extraverts, Introverts), Between Each

Significant Responses Between **All Extraverts and Introverts**

Category	Objective	Chi Sq Statistic	Level of Significance
Extravert	----	----	----
Introvert	Master Subject	294.63	***
	Gain Understanding	112.36	***

Significant Responses Between **Differentiated Extraverts and Introverts**

Category	Objective	Chi Sq Statistic	Level of Significance
Extravert	Master Subject	261.13	***
Introvert	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Extraverts & Introverts**

Significant Differentiated Responses

Category	Objective	Chi Sq Statistic	Level of Significance
Diff to Extravert	Master Subject	190.07	***
Diff to Introvert	Master Subject	176.62	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

Objectives for Course Liked (Sensing, Intuition), Within Each

Significant Responses Sensing, Objectives for Course Liked				
Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All	Master Subj	281	281.48	***
(N=429)	Gain Under	141	10.62	*
Differentiated	Master Subj	231	228.00	***
(N=355)	Gain Under	119	10.31	*

Significant Responses Intuition, Objectives for Course Liked				
Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All	Master Subj	189	225.66	***
(N=266)				
Differentiated	Master Subj	137	156.35	***
(N=197)				

Significant Responses Total Undifferentiated (Ss and Ns), Objectives for Course Liked				
Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns	Master Subj	143	122.77	***
(N=143)				

Objectives for Course Liked (Sensing, Intuition), Between Each

Significant Responses Between All Sensing and Intuition			
Category	Objective	Chi Sq Statistic	Level of Significance
Sensing	Master Subject	303.89	***
	Gain Understanding	116.54	***
Intuition	----	----	-----

Significant Responses Between Differentiated Sensing and Intuition			
Category	Objective	Chi Sq Statistic	Level of Significance
Sensing	Gain Understanding	99.73	***
Intuition	Master Subject	245.94	***

Significant Responses Between Total Undifferentiated and Differentiated Sensing and Intuition Significant Undifferentiated Responses			
Category	Objective	Chi Sq Statistic	Level of Significance
Diff to Sensing	Master Subject	208.25	***
Diff to Intuition	Master Subject	132.19	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

Objectives for Course Liked (Feeling, Thinking), Within Each

Significant Responses **Thinking**, Objectives for Course Liked				
Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All (N=518)	Master Subj	402	458.87	***
Differentiated (N=494)	Master Subj	340	379.53	***

Significant Responses **Feeling**, Objectives for Course Liked				
Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All	Master Subj	68	51.34	***
(N=117)	Gain Under	46	9.59	*
Differentiated	Master Subj	39	26.41	***
(N=70)	Gain Under	30	8.93	*

Significant Responses **Total Undifferentiated (Ts and Fs)**, Objectives for Course Liked				
Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs (N=131)	Master Subj	91	103.61	***

Objectives for Course Liked (Thinking, Feeling), Between Each

Significant Responses Between **All Thinking and Feeling**			
Category	Objective	Chi Sq Statistic	Level of Significance
Thinking	Master Subject	334.74	***
Feeling	Gain Understanding	226.51	***

Significant Responses Between **Differentiated Thinking and Feeling**			
Category	Objective	Chi Sq Statistic	Level of Significance
Thinking	Master Subject	211.02	***
Feeling	Gain Understanding	273.99	***

Significant Responses Between **Total Undifferentiated and Differentiated Thinking and Feeling**			
Significant Differentiated Responses			
Category	Objective	Chi Sq Statistic	Level of Significance
Diff to Thinking	Master Subject	333.10	***
Diff to Feeling	Master Subject	30.75	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

Objectives for Course Liked (Judging, Perceiving), Within Each

Significant Responses **Judging**, Objectives for Course Liked

Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All (N=445)	Master Subj	312	362.25	***
Differentiated (N=317)	Master Subj	235	306.10	***

Significant Responses **Perceiving**, Objectives for Course Liked

Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
All	Master Subj	158	145.92	***
(N=250)	Gain Under	85	8.10	*
Differentiated	Master Subj	103	86.12	***
(N=170)	Gain Under	61	8.05	*

Significant Responses **Total Undifferentiated (Js and Ps)**, Objectives for Course Liked

Category	Objective	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps (N=208)	Master Subj	132	123.08	***

Objectives for Course Liked (Judging, Perceiving), Between Each

Significant Responses Between **All Judging and Perceiving**

Category	Objective	Chi Sq Statistic	Level of Significance
Judging	Master Subject	174.38	***
Perceiving	Gain Understanding	71.30	***

Significant Responses Between **Differentiated Judging and Perceiving**

Category	Objective	Chi Sq Statistic	Level of Significance
Judging	Master Subject	125.21	***
Perceiving	Gain Understanding	41.48	***

Significant Responses Between **Total Undifferentiated and Differentiated Judging and Perceiving**

Category	Objective	Chi Sq Statistic	Level of Significance
	Significant Undifferentiated Responses		
Undiff to Perceive	Master Subject	97.52	***
	Significant Differentiated Responses		
Diff to Judging	Master Subject	272.99	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

D.2.a.

Top Five Courses with Study Groups (Intuition-Thinking & Sensing-Feeling)

Significant Responses all **Intuition-Thinking**			
Course	Frequency	Chi Sq Statistic	Level of Significance
Did Not Use Groups	285	463.07	***
N=720			
Statistics	143	239.18	***
Quantitative Decision Mkg	88	49.20	***
Computer Programming	79	31.71	**
Economics	72	20.75	---
Significant Responses Differentiated **Intuition-Thinking**			
Did Not Use Groups	151	453.99	***
N=384			
Statistics	72	108.09	***
Quantitative Decision Mkg	42	16.68	---
Economics	39	11.92	---
Computer Programming	38	10.52	---

Significant Responses all **Sensing-Feeling**			
Course	Frequency	Chi Sq Statistic	Level of Significance
Did Not Use Groups	66	168.11	***
N=194			
Statistics	38	61.95	***
Quantitative Decision Mkg	32	37.14	**
Economics	17	2.73	---
Computer Programming	16	1.84	---
Significant Responses Differentiated **Sensing-Feeling**			
Did Not Use Groups	41	145.47	***
N=89			
Statistics	18	31.12	---
Quantitative Decision Mkg	14	14.67	---
Economics	10	4.34	---
Acquisition	9	2.71	---

15 Degrees of Freedom

Test Stat	Level of Significance	Symbol
24.996	$p < .05$	*
30.578	$p < .01$	**
37.700	$p < .001$	***

Top Five Courses with Study Groups
Between all Intuition-Feeling and Sensing-Thinking

Course	Chi Sq Statistic	Level of Significance
Intuition-Feeling Responses (as compared to Sensing-Thinking)		
Economics	----	----
Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Did Not Use Groups	433.75	***
Statistics	277.45	***
Quantitative Decision Mkg	196.33	***
Computer Programming	----	----

Top Five Courses with Study Groups
Between Differentiated Intuition-Feeling and Sensing-Thinking

Course	Chi Sq Statistic	Level of Significance
Intuition-Feeling Responses (as compared to Sensing-Thinking)		
Economics	----	----
Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Did Not Use Groups	404.45	***
Statistics	227.49	***
Quantitative Decision Mkg	160.98	***
Computer Programming	----	----

Top Five Courses with Study Groups
Between all Intuition-Thinking and Sensing-Feeling

Course	Chi Sq Statistic	Level of Significance
Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Did Not Use Groups	72.84	***
Statistics	35.97	**
Quantitative Decision Mkg	----	----
Computer Programming	----	----
Economics	----	----
Sensing-Feeling Responses (as compared to Intuition-Thinking)		
----	----	----

Top Five Courses with Study Groups
Between Differentiated Intuition-Thinking and Sensing-Feeling

Course	Chi Sq Statistic	Level of Significance
Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Did Not Use Groups	35.57	**
Statistics	----	----
Quantitative Decision Mkg	----	----
Computer Programming	----	----
Economics	----	----
Sensing-Feeling Responses (as compared to Intuition-Thinking)		
Acquisition	----	----

21 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	29.296	$p < .05$	*
	32.000	$p < .01$	**
	39.252	$p < .001$	***

Top Five Courses with Study Groups (Intuition-Feeling & Sensing-Thinking)

Course	Frequency	Chi Sq Statistic	Level of Significance
Significant Responses all Intuition-Feeling.			
Did Not Use Groups	75	163.35	***
N=250			
Statistics	48	75.38	***
Quantitative Decision Mkg	34	25.32	*
Computer Programming	28	12.02	---
Economics	26	8.67	---
Significant Responses Differentiated Intuition-Feeling			
Did Not Use Groups	27	27.12	*
N=128			
Statistics	24	28.06	*
Quantitative Decision Mkg	17	8.41	---
Economics	15	4.91	---
Computer Programming	15	4.91	---

Course	Frequency	Chi Sq Statistic	Level of Significance
Significant Responses all Sensing-Thinking			
Did Not Use Groups	544	1691.80	***
N=1341			
Statistics	264	434.43	***
Quantitative Decision Mkg	172	109.92	***
Computer Programming	159	81.37	***
Economics	118	19.40	---
Significant Responses Differentiated Sensing-Thinking			
Did Not Use Groups	440	1678.72	***
N=1035			
Statistics	205	180.53	***
Quantitative Decision Mkg	129	25.83	*
Computer Programming	129	25.83	*
Economics	91	.82	---

15 Degrees of Freedom

Test Stat	Level of Significance	Symbol
24.996	$p < .05$	*
30.578	$p < .01$	**
37.700	$p < .001$	***

D.2.b.
Top 5 Number in Study Groups (Intuition-Feeling & Sensing-Thinking)

Number In Group	Frequency	Chi Sq Statistic	Level of Significance
Significant Responses all Intuition-Feeling			
0	88	362.98	***
N=237			
3	46	115.20	***
4	45	108.75	***
2	42	90.52	***
1	26	21.52	----
Significant Responses Differentiated Intuition-Feeling			
0	37	75.15	***
N=118			
4	24	48.28	***
2	17	17.50	---
3	17	17.50	---
1	14	8.99	---

Number In Group	Frequency	Chi Sq Statistic	Level of Significance
Significant Responses all Sensing-Thinking			
0	598	3063.31	***
N=1287			
3	305	1038.67	***
4	256	666.77	***
2	234	526.50	***
5	141	116.35	***
Significant Responses Differentiated Sensing-Thinking			
0	476	3061.41	***
N=999			
2	241	505.41	***
3	192	265.66	***
1	179	214.88	***
4	111	36.96	*

20 Degrees of Freedom

Test Stat	Level of Significance	Symbol
31.41	$p < .05$	*
37.57	$p < .01$	**
45.32	$p < .001$	***

Top 5 Number in Study Groups (Intuition-Thinking & Sensing-Feeling)

Significant Responses all Intuition-Thinking			
Number In Group	Frequency	Chi Sq Statistic	Level of Significance
0	311	1540.96	***
N=694			
3	156	491.00	***
2	130	307.28	***
4	126	282.82	***
1	86	94.00	***
Significant Responses Differentiated Intuition-Thinking			
0	144	589.01	***
N=391			
3	85	254.29	***
4	65	125.50	***
2	63	115.10	***
1	57	86.58	***

Significant Responses all Sensing-Feeling			
Number In Group	Frequency	Chi Sq Statistic	Level of Significance
0	79	381.90	***
N=181			
3	51	222.37	***
4	31	63.03	***
2	24	30.24	---
5	17	9.35	---
Significant Responses Differentiated Sensing-Feeling			
0	48	299.82	***
N=82			
3	25	121.41	***
2	10	10.56	----
4	10	10.56	----
5	10	10.56	----

20 Degrees of Freedom

Test Stat	Level of Significance	Symbol
31.41	$p < .05$	*
37.57	$p < .01$	**
45.32	$p < .001$	***

Top 5 Number in Study Groups Between all Intuition-Feeling and Sensing-Thinking

Number in Group	Chi Sq Statistic	Level of Significance
Intuition-Feeling Responses (as compared to Sensing-Thinking)		
----	----	----
Sensing-Thinking Responses (as compared to Intuition-Feeling)		
0	509.23	***
3	265.66	***
2	242.64	***
4	260.02	***
1	149.97	***

Top 5 Number in Study Groups Between Differentiated Intuition-Feeling and Sensing-Thinking

Number in Group	Chi Sq Statistic	Level of Significance
Intuition-Feeling Responses (as compared to Sensing-Thinking)		
----	----	----
Sensing-Thinking Responses (as compared to Intuition-Feeling)		
0	325.09	***
4	227.55	***
2	160.67	***
3	160.28	***
1	----	----

Top 5 Number in Study Groups Between all Intuition-Thinking and Sensing-Feeling

Number in Group	Chi Sq Statistic	Level of Significance
Intuition-Thinking Responses (as compared to Sensing-Feeling)		
0	79.48	***
3	39.92	**
2	32.92	*
4	----	----
1	----	----
Sensing-Feeling Responses (as compared to Intuition-Thinking)		
----	----	----

Top 5 Number in Study Groups Between Differentiated Intuition-Thinking and Sensing-Feeling

Number in Group	Chi Sq Statistic	Level of Significance
Intuition-Thinking Responses (as compared to Sensing-Feeling)		
0	33.62	*
3	----	----
2	----	----
4	----	----
1	----	----
Sensing-Feeling Responses (as compared to Intuition-Thinking)		
----	----	----

21 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	32.67	$p < .05$	*
	38.93	$p < .01$	**
	46.80	$p < .001$	***

D.2.c.

Objectives for Course Disliked (Intuition-Feeling and Sensing-Thinking)

Significant Responses all **Intuition-Feeling**

N=65

Objective	Frequency	Chi Sq Statistic	Level of Significance
Gain Understanding	33	17.27	***

Significant Responses Differentiated **Intuition-Feeling**

N=31

Gain Understanding	17	11.04	*

Significant Responses all **Sensing-Thinking**

N=377

Objective	Frequency	Chi Sq Statistic	Level of Significance
Gain Understanding	225	181.39	***
Enough to Pass	127	11.38	**

Significant Responses Differentiated **Sensing-Thinking**

N=295

Gain Understanding	171	128.23	***
Enough to Pass	107	14.99	**

Objectives for Course Disliked (Intuition-Thinking and Sensing-Feeling)

Significant Responses all **Intuition-Thinking**

N=201

Objective	Frequency	Chi Sq Statistic	Level of Significance
Gain Understanding	121	99.61	**

Significant Responses Differentiated **Intuition-Thinking**

N=107

Gain Understanding	66	57.59	***

Significant Responses all **Sensing-Feeling**

N=52

Objective	Frequency	Chi Sq Statistic	Level of Significance
Gain Understanding	26	13	**

Significant Responses Differentiated **Sensing-Feeling**

N=26

----	----	----	----

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

Objectives for Course Disliked Between all Intuition-Feeling and Sensing-Thinking

Objective	Chi Sq Statistic	Level of Significance
Intuition-Feeling Responses (as compared to Sensing-Thinking)		
---	---	---
Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Gain Understanding	190.22	***
Enough to Pass	132.45	***

Objectives for Course Disliked Between
Differentiated Intuition-Feeling and Sensing-Thinking

Objective	Chi Sq Statistic	Level of Significance
Intuition-Feeling Responses (as compared to Sensing-Thinking)		
----	----	----
Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Gain Understanding	160.72	***
Enough to Pass	103.66	***

Objectives for Course Disliked Between all Intuition-Thinking and Sensing-Feeling

Objective	Chi Sq Statistic	Level of Significance
Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Gain Understanding	30.47	***
Sensing-Feeling Responses (as compared to Intuition-Thinking)		
----	----	----

Objectives for Course Disliked Between
Differentiated Intuition-Thinking and Sensing-Feeling

Objective	Chi Sq Statistic	Level of Significance
Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Gain Understanding	15.22	**
Sensing-Feeling Responses (as compared to Intuition-Thinking)		
----	----	----

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

D.2.d.
Objectives for Course Liked (Intuition-Feeling and Sensing-Thinking)

Significant Responses all Intuition-Feeling

N=65

Objective	Frequency	Chi Sq Statistic	Level of Significance
Master Subject	43	44.03	***

Significant Responses Differentiated Intuition-Feeling,

N=31

Master Subject	17	11.04	*

Significant Responses all Sensing-Thinking

N=377

Objective	Frequency	Chi Sq Statistic	Level of Significance
Master Subject	256	277.59	***

Significant Responses Differentiated Sensing-Thinking

N=295

Master Subject	195	199.34	***

Objectives for Course Liked (Intuition-Thinking and Sensing-Feeling)

Significant Responses all Intuition-Thinking

N=201

Objective	Frequency	Chi Sq Statistic	Level of Significance
Master Subject	146	182.45	***

Significant Responses Differentiated Intuition-Thinking

N=107

Master Subject	75	87.03	***

Significant Responses all Sensing-Feeling

N=52

Objective	Frequency	Chi Sq Statistic	Level of Significance
Master Subject	27	15.07	**
Gain Understanding	25	11.07	*

Significant Responses Differentiated Sensing-Feeling

N=26

Master Subject	16	13.88	**

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

Objectives for Course Liked Between all Intuition-Feeling and Sensing-Thinking

Objective	Chi Sq Statistic	Level of Significance
Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)		
---	---	---
Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Master Subject	248.37	***

Objectives for Course Liked
Between Differentiated Intuition-Feeling and Sensing-Thinking

Objective	Chi Sq Statistic	Level of Significance
Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)		
---	---	---
Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Master Subject	160.57	***

Objectives for Course Liked Between all Intuition-Thinking and Sensing-Feeling

Objective	Chi Sq Statistic	Level of Significance
Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Master Subject	37.11	***
Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)		
Gain Understanding	12.04	**

Significant Responses between **Differentiated Intuition-Thinking and Sensing-Feeling**

Objective	Chi Sq Statistic	Level of Significance
Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Master Subject	87.03	***
Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)		
---	---	---

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

Appendix E - Testing Preference

E.1.a

Exam Preference (Extraverts, Introverts), Within Each

Significant Responses **Extraverts**, Exam Preference

Category	Exam	Frequency	Chi Sq Statistic	Level of Significance
All (N=283)	Objective	159	110.08	***
Differentiated (N=240)	Objective	240	143.56	***

Significant Responses **Introverts**, Exam Preference

Category	Exam	Frequency	Chi Sq Statistic	Level of Significance
All (N=412)	Objective	248	204.13	***
Differentiated (N=261)	Objective	156	126.22	***

Significant Responses **Total Undifferentiated (Es and Is)**, Exam Preference

Category	Exam	Frequency	Chi Sq Statistic	Level of Significance
Es and Is (N=194)	Objective	118	99.59	***

Exam Preference (Extraverts, Introverts), Between Each

Significant Responses Between **All Extraverts and Introverts**

Category	Exam	Chi Sq Statistic	Level of Significance
Extravert	---	---	---
Introvert	Objective	230.41	***

Significant Responses Between **Differentiated Extraverts and Introverts**

Category	Exam	Chi Sq Statistic	Level of Significance
Extravert	---	---	---
Introvert	Objective	143.56	***

Significant Responses Between **Total Undifferentiated and Differentiated Extraverts and Introverts**

Category	Exam	Chi Sq Statistic	Level of Significance
Significant Undifferentiated Responses			
Undiff to Extravert	Objective	119.94	***
Significant Differentiated Responses			
Diff to Introvert	Objective	151.95	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

Exam Preference (Sensing, Intuition), Within Each

Significant Responses Sensing, Exam Preference				
Category	Exam	Frequency	Chi Sq Statistic	Level of Significance
All	Objective	270	246.97	***
Differentiated	Objective	227	215.35	***

Significant Responses Intuition, Exam Preference				
Category	Exam	Frequency	Chi Sq Statistic	Level of Significance
All (N=266)	Objective	137	219.73	***
Differentiated (N=197)	Objective	98	175.32	***

Significant Responses Total Undifferentiated (Ss and Ns), Exam Preference				
Category	Exam	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns	Objective	82	59.83	***

Exam Preference (Sensing, Intuition), Between Each

Significant Responses Between All Sensing and Intuition			
Category	Exam	Chi Sq Statistic	Level of Significance
Sensing	Objective	219.73	***
Intuition	---	---	---

Significant Responses Between Differentiated Sensing and Intuition			
Category	Exam	Chi Sq Statistic	Level of Significance
Sensing	Objective	175.31	***
Intuition	----	----	----

Significant Responses Between Total Undifferentiated and Differentiated Sensing and Intuition			
Significant Undifferentiated Responses			
Category	Exam	Chi Sq Statistic	Level of Significance
Undiff to Intuition	Objective	83.64	***
Significant Differentiated Responses			
Diff to Sensing	Objective	250.65	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

Exam Preference (Thinking, Feeling), Within Each

Significant Responses **Thinking**, Exam Preference

Category	Exam	Frequency	Chi Sq Statistic	Level of Significance
All (N=578)	Objective	346	280.98	***
Differentiated (N=494)	Objective	307	272.65	***

Significant Responses **Feeling**, Exam Preference

Category	Exam	Frequency	Chi Sq Statistic	Level of Significance
All (N=117)	Objective	346	34.46	***
Differentiated (N=70)	Objective	307	26.41	***

Significant Responses **Total Undifferentiated (Ts and Fs)**, Exam Preference

Category	Exam	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs (N=131)	Objective	61	24.37	***

Exam Preference (Thinking, Feeling), Between Each

Significant Responses Between **All Thinking and Feeling**

Category	Exam	Chi Sq Statistic	Level of Significance
Feeling	----	----	----
Thinking	Objective	300.20	***

Significant Responses Between **Differentiated Thinking and Feeling**

Category	Exam	Chi Sq Statistic	Level of Significance
Feeling	----	----	----
Thinking	Objective	274.11	***

Significant Responses Between ***Total Undifferentiated and Differentiated* Thinking and Feeling**

Significant Differentiated Responses

Category	Exam	Chi Sq Statistic	Level of Significance
Diff to Feeling	Objective	46.13	***
Diff to Thinking	Objective	405.95	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

Exam Preference (Judging, Perceiving), Within Each

Significant Responses **Judging**, Exam Preference				
Category	Exam	Frequency	Chi Sq Statistic	Level of Significance
All (N=445)	Objective	269	223.67	***
Differentiated (N=317)	Objective	194	166.15	***

Significant Responses **Perceiving**, Exam Preference				
Category	Exam	Frequency	Chi Sq Statistic	Level of Significance
All (N=250)	Objective	138	91.20	***
Differentiated (N=170)	Objective	88	48.71	***

Significant Responses **Total Undifferentiated (Js and Ps)**, Exam Preference				
Category	Exam	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps (N=208)	Objective	125	102.48	***

Exam Preference (Judging, Perceiving), Between Each

Significant Responses Between **All Judging and Perceiving**			
Category	Exam	Chi Sq Statistic	Level of Significance
Judging	Objective	150.21	***
Perceiving	----	----	----

Significant Responses Between **Differentiated Judging and Perceiving**			
Category	Exam	Chi Sq Statistic	Level of Significance
Judging	Objective	103.19	***
Perceiving	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Judging and Perceiving**			
Significant Undifferentiated Responses			
Category	Exam	Chi Sq Statistic	Level of Significance
Undiff to Perceiving	Objective	74.98	***
Significant Differentiated Responses			
Diff to Judging	Objective	196.04	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

E.1.b.

Question Preference (Extraverts, Introverts), Within Each

Significant Responses **Extraverts**, Question Preference

Category	Question	Frequency	Chi Sq Statistic	Level of Significance
All (N=283)	Written	169	223.21	***
Differentiated (N=240)	Written	139	172.52	***

Significant Responses **Introverts**, Question Preference

Category	Question	Frequency	Chi Sq Statistic	Level of Significance
All (N=412)	Written	257	369.97	***
Differentiated (N=	Written	169	261.3[illegible]	***

Significant Responses **Total Undifferentiated (Es and Is)**, Question Preference

Category	Question	Frequency	Chi Sq Statistic	Level of Significance
Es and Is (N=194)	Written	118	161.67	***

Question Preference (Extraverts, Introverts), Between Each

Significant Responses Between **All Extraverts and Introverts**

Category	Question	Chi Sq Statistic	Level of Significance
Extravert	---	---	---
Introvert	Written	244.99	***

Significant Responses Between **Differentiated Extraverts and Introverts**

Category	Question	Chi Sq Statistic	Level of Significance
Extravert	---	---	---
Introvert	Written	172.52	***

Significant Responses Between **Total Undifferentiated and Differentiated Extraverts and Introverts**

Significant Differentiated Responses

Category	Question	Chi Sq Statistic	Level of Significance
Undiff to Extravert	Written	131.12	***
Undiff to Introvert	Written	178.56	***

4 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

Question Preference (Sensing, Intuition), Within Each

Significant Responses Sensing, Question Preference

Category	Question	Frequency	Chi Sq Statistic	Level of Significance
All (N=429)	Written	281	444.09	***
Differentiated (N=355)	Written	237	388.11	***

Significant Responses Intuition, Question Preference

Category	Question	Frequency	Chi Sq Statistic	Level of Significance
All (N=266)	Written	145	158.41	***
Differentiated (N=197)	Written	111	130.12	***

Significant Responses Total Undifferentiated (Ss and Ns), Question Preference

Category	Question	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns (N=143)	Written	78	85.33	***

Question Preference (Sensing, Intuition), Between Each

Significant Responses Between All Sensing and Intuition

Category	Question	Chi Sq Statistic	Level of Significance
Sensing	Written	232.65	***
Intuition	---	---	---

Significant Responses Between Differentiated Sensing and Intuition

Category	Question	Chi Sq Statistic	Level of Significance
Sensing	Written	198.84	***
Intuition	----	----	----

Significant Responses Between Total Undifferentiated and Differentiated Sensing and Intuition

Significant Differentiated Responses

Category	Question	Chi Sq Statistic	Level of Significance
Diff to Intuition	Written	113.28	***
	Written	287.59	***

4 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

Question Preference (Thinking, Feeling), Within Each

Significant Responses **Thinking**, Question Preference

Category	Question	Frequency	Chi Sq Statistic	Level of Significance
All (N=578)	Written	349	471.24	***
Differentiated (N=494)	Written	304	426.18	***

Significant Responses **Feeling**, Question Preference

Category	Question	Frequency	Chi Sq Statistic	Level of Significance
All (N=117)	Written	77	122.78	***
Differentiated (N=70)	Written	45	68.64	***

Significant Responses **Total Undifferentiated (Ts and Fs)**, Question Preference

Category	Question	Frequency	Chi Sq Statistic	Level of Significance
Fs and Ts (N=131)	Written	77	98.50	***

Question Preference (Thinking, Feeling), Between Each

Significant Responses Between **All Thinking and Feeling**

Category	Question	Chi Sq Statistic	Level of Significance
Thinking	Written	379.48	***
Feeling	----	----	----

Significant Responses Between **Differentiated Thinking and Feeling**

Category	Question	Chi Sq Statistic	Level of Significance
Thinking	Written	316.61	***
Feeling	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Thinking and Feeling**

Significant Undifferentiated Responses

Category	Question	Chi Sq Statistic	Level of Significance
Undiff to Feeling	Written	48.68	***
Significant Differentiated Responses			
Diff to Thinking	Written	314.50	***

4 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

Question Preference (Judging, Perceiving), Within Each

Significant Responses Judging, Question Preference

Category	Question	Frequency	Chi Sq Statistic	Level of Significance
All (N=445)	Written	297	486.11	***
Differentiated (N=317)	Written	214	357.73	***

Significant Responses Perceiving, Question Preference

Category	Question	Frequency	Chi Sq Statistic	Level of Significance
All (N=250)	Written	129	124.82	***
Differentiated (N=170)	Written	81	64.97	***

Significant Responses Total Undifferentiated (Js and Ps), Question Preference

Category	Question	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps (N=208)	Written	131	192.12	***

Question Preference (Judging, Perceiving), Between Each

Significant Responses Between All Judging and Perceiving

Category	Question	Chi Sq Statistic	Level of Significance
Judging	Written	166.08	***
Perceiving	----	----	----

Significant Responses Between Differentiated Judging and Perceiving

Category	Question	Chi Sq Statistic	Level of Significance
Judging	Written	114.06	***
Perceiving	----	----	----

Significant Responses Between Total Undifferentiated and Differentiated Judging and Perceiving

Significant Undifferentiated Responses

Category	Question	Chi Sq Statistic	Level of Significance
Undiff to Judging	Written	227.86	***
	Written	60.46	***

4 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

E.1.c.

Question Stem Preference (Extraverts, Introverts), Within Each

Significant Responses Extraverts, Question Stem Preference

Category	Question Stem	Frequency	Chi Sq Statistic	Level of Significance
All	Why does . . .	102	36.42	***
(N=283)	True/False	92	22.14	***
Differentiated	Why does . . .	82	24.08	***
(N=240)	True/False	77	17.52	**

Significant Responses Introverts, Question Stem Preference

Category	Question Stem	Frequency	Chi Sq Statistic	Level of Significance
All	Why does . . .	162	76.89	***
(N=412)	True/False	155	63.96	***
Differentiated	Why does . . .	105	53.41	***
(N=261)	True/False	97	38.45	***

Significant Responses Total Undifferentiated (Es and Is), Question Stem Preference

Category	Question Stem	Frequency	Chi Sq Statistic	Level of Significance
Es and Is	Why does . . .	77	37.61	***
(N=194)	True/False	73	30.15	***

Question Stem Preference (Extraverts, Introverts), Between Each

Significant Responses Between All Extraverts and Introverts

Category	Question Stem	Chi Sq Statistic	Level of Significance
Extravert	---	---	---
Introvert	Why does . . .	147.40	***
	True/False	132.78	***

Significant Responses Between Differentiated Extraverts and Introverts

Category	Question Stem	Chi Sq Statistic	Level of Significance
Extravert	---	---	---
Introvert	Why does . . .	87.99	***
	True/False	82.58	***

Significant Responses Between Total Undifferentiated and Differentiated Extraverts and Introverts

Category	Question Stem	Chi Sq Statistic	Level of Significance
	Significant Undifferentiated Responses		
Undiff to Extravert	Why does . . .	69.35	***
	True/False	64.42	***
	Significant Differentiated Responses		
Diff to Introvert	Why does . . .	105.81	***
	True/False	94.46	***

4 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

Question Stem Preference (Sensing, Intuition), Within Each

Significant Responses Sensing, Question Stem Preference				
Category	Question Stem	Frequency	Chi Sq Statistic	Level of Significance
All	True/False	179	101.24	***
(N=429)	Why does . . .	147	43.65	***
Differentiated	True/False	155	99.38	***
(N=355)	Why does . . .	114	26.04	***

Significant Responses Intuition, Question Stem Preference				
Category	Question Stem	Frequency	Chi Sq Statistic	Level of Significance
All (N=266)	Why does . . .	117	76.51	***
Differentiated (N=197)	Why does . . .	87	57.51	***

Significant Responses Total Undifferentiated (Ss and Ns), Question Stem Preference				
Category	Question Stem	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns (N=143)	Why does . . .	63	41.38	***

Question Stem Preference (Sensing, Intuition), Between Each

Significant Responses Between All Sensing and Intuition			
Category	Question Stem	Chi Sq Statistic	Level of Significance
Sensing	True/False	108.04	***
Intuition	Why does . . .	187.92	***

Significant Responses Between Differentiated Sensing and Intutition			
Category	Question Stem	Chi Sq Statistic	Level of Significance
Sensing	True/False	86.54	***
Intuition	Why does . . .	156.05	***

Significant Responses Between Total Undifferentiated and Differentiated Sensing and Intutition			
Significant Undifferentiated Responses			
Category	Question Stem	Chi Sq Statistic	Level of Significance
Undiff to Sensing	Why does . . .	80.61	***
Significant Differentiated Responses			
Diff to Sensing	True/False	222.58	
Diff to Intuition	Why does . . .	85.83	***

4 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	p < .05	*
13.28	p < .01	**
18.47	p <.001	***

Question Stem Preference (Thinking, Feeling), Within Each

Significant Responses Thinking, Question Stem Preference				
Category	Question Stem	Frequency	Chi Sq Statistic	Level of Significance
All	Why does . . .	225	103.53	***
(N=578)	True/False	211	78.73	***
Differentiated	True/False	191	86.04	***
(N=494)	Why does . . .	188	80.53	***

Significant Responses Feeling, Question Stem Preference				
Category	Question Stem	Frequency	Chi Sq Statistic	Level of Significance
All (N=117)	Why does . . .	39	10.4	*
Differentiated (N=70)	----	---	----	----

Significant Responses Total Undifferentiated (Ts and Fs), Question Stem Preference				
Category	Question Stem	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs	Explian Why	53	27.41	***

Question Stem Preference (Thinking, Feeling), Between Each

Significant Responses Between All Thinking and Feeling			
Category	Question Stem	Chi Sq Statistic	Level of Significance
Thinking	Why does . . .	191.50	***
	True/False	176.66	***
Feeling	----	----	----

Significant Responses Between Differentiated Thinking and Feeling			
Category	Question Stem	Chi Sq Statistic	Level of Significance
Thinking	Why does . . .	161.16	***
	True/False	154.03	***
Feeling	----	----	----

Significant Responses Between Total Undifferentiated and Differentiated Thinking and Feeling			
Significant Undifferentiated Responses			
Category	Question Stem	Chi Sq Statistic	Level of Significance
Undiff to Feeling	Why does . . .	18.14	**
Significant Differentiated Responses			
Diff to Thinking	True/False	280.76	***
	Why does . . .	173.07	***

Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

Question Stem Preference (Judging, Perceiving), Within Each

Significant Responses Judging, Question Stem Preference				
Category	Question Stem	Frequency	Chi Sq Statistic	Level of Significance
All (N=445)	Why does . . .	164	63.20	***
	True/False	164	63.20	***
Differentiated	Why does . . .	124	57.92	***
(N=317)	True/False	114	40.38	***

Significant Responses Perceiving, Question Stem Preference				
Category	Question Stem	Frequency	Chi Sq Statistic	Level of Significance
All	Why does . . .	100	50.00	***
(N=250)	True/False	83	21.78	***
Differentiated (N=170)	Why does . . .	74	47.06	***
Undifferentiated (N=80)	True/False	41	39.06	***

Significant Responses Total Undifferentiated (Js and Ps), Question Stem Preference				
Category	Question Stem	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps	True/False	91	58.66	***
(N=208)	Why does . . .	66	14.31	**

Question Stem Preference (Judging, Perceiving), Between Each

Significant Responses Between All Judging and Perceiving			
Category	Question Stem	Chi Sq Statistic	Level of Significance
Judging	True/False	91.23	***
	Explain Why	91.05	***
Perceiving	----	----	----

Significant Responses Between Differentiated Judging and Perceiving			
Category	Question Stem	Chi Sq Statistic	Level of Significance
Judging	Explain Why	65.39	***
	True/False	60.45	***
Perceiving	----	----	----

Significant Responses Between Total Undifferentiated and Differentiated Judging and Perceiving			
Significant Undifferentiated Responses			
Category	Question Stem	Chi Sq Statistic	Level of Significance
Undiff to Judging	True/False	92.18	***
Undiff to Perceiving	True/False	22.90	***
Significant Differentiated Responses			
Diff to Judging	Why does . . .	151.34	***
Diff to Perceiving	Why does . . .	100.70	***

4 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

E.2.a.

Exam Preference (Intuition-Feeling and Sensing-Thinking)

Significant Responses all Intuition-Feeling

N=65

Exam	Frequency	Chi Sq Statistic	Level of Significance
Objective	32	15.27	**

Significant Responses Differentiated **Intuition-Feeling**, Exam Preference

N=31

----	----	----	----

Significant Responses all Sensing-Thinking

N=377

Exam	Frequency	Chi Sq Statistic	Level of Significance
Objective	241	228.49	***

Significant Responses Differentiated **Sensing-Thinking**, Exam Preference

N=295

Objective	192	189.60	***

Exam Preference (Intuition-Thinking and Sensing-Feeling)

Significant Responses all Intuition-Thinking

N=201

Exam	Frequency	Chi Sq Statistic	Level of Significance
Objective	105	59.65	***

Significant Responses Differentiated **Intuition-Thinking**

N=107

Objective	60	41.33	***

Significant Responses all Sensing-Feeling

N=52

Exam	Frequency	Chi Sq Statistic	Level of Significance
Objective	29	19.69	***

Significant Responses Differentiated **Sensing-Feeling**

N=26

Objective	17	16.96	***

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

Exam Preference Between all Intuition-Feeling and Sensing-Thinking

Exam	Chi Sq Statistic	Level of Significance
Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)		
---	---	---
Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Objective	184.30	***

Exam Preference Between Differentiated Intuition-Feeling and Sensing-Thinking

Exam	Chi Sq Statistic	Level of Significance
Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)		
---	---	---
Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Objective	122.16	***

Exam Preference Between all Intuition-Thinking and Sensing-Feeling

Exam	Chi Sq Statistic	Level of Significance
Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Objective	26.10	***
Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)		
---	---	---

Exam Preference Between Differentiated Intuition-Thinking and Sensing-Feeling

Exam	Chi Sq Statistic	Level of Significance
Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Objective	13.41	**
Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)		
---	---	---

3 Degrees of Freedom

Test Stat	Level of Significance	Symbol
7.815	$p < .05$	*
11.34	$p < .01$	**
16.27	$p < .001$	***

E.2.b.
Question Preference (Intuition-Feeling and Sensing-Thinking)

Significant Responses all Intuition-Feeling

N=65

Question	Frequency	Chi Sq Statistic	Level of Significance
Written	37	44.31	***

Significant Responses Differentiated Intuition-Feeling

N=31

Written	16	15.49	**

Significant Responses all Sensing-Thinking

N=377

Question	Frequency	Chi Sq Statistic	Level of Significance
Written	241	363.71	***

Significant Responses Differentiated Sensing-Thinking

Written	193	304.34	***

Question Preference (Intuition-Thinking and Sensing-Feeling)

Significant Responses all Intuition-Thinking

N=201

Question	Frequency	Chi Sq Statistic	Level of Significance
Written	108	114.35	***

Significant Responses Differentiated **Intuition-Thinking**, Question Preference

N=107

Written	61	73.27	***

Significant Responses all Sensing-Feeling

N=52

Question	Frequency	Chi Sq Statistic	Level of Significance
Written	40	84.25	***

Significant Responses Differentiated Sensing-Feeling

N=26

Written	20	42.12	***

4 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

Question Preference Between all Intuition-Feeling and Sensing-Thinking

Question	Chi Sq Statistic	Level of Significance
Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)		
---	---	---
Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Written	213.48	***

Question Preference Between Differentiated Intuition-Feeling and Sensing-Thinking

Question	Chi Sq Statistic	Level of Significance
Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)		
---	---	---
Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Written	150.99	***

Question Preference Between all Intuition-Thinking and Sensing-Feeling

Question	Chi Sq Statistic	Level of Significance
Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Written	26.51	***
Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)		
---	---	---

Question Preference Between Differentiated Intuition-Thinking and Sensing-Feeling

Question	Chi Sq Statistic	Level of Significance
Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Written	13.41	**
Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)		
---	---	---

4 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

E.2.c.
Question Stems (Intuition-Feeling and Sensing-Thinking)

Significant Responses all Intuition-Feeling

N=65

Question Structure	Frequency	Chi Sq Statistic	Level of Significance
----	----	----	----

Significant Responses Differentiated Intuition-Feeling

N=31

----	----	----	----

Significant Responses all Sensing-Thinking

N=377

Question Structure	Frequency	Chi Sq Statistic	Level of Significance
True/False	160	94.92	***
Why Does...	130	39.54	***

Significant Responses Differentiated Sensing-Thinking

N=295

True/False	129	83.05	***
Why Does...	99	27.12	***

Question Stems (Intuition-Thinking and Sensing-Feeling)

Significant Responses all Intuition-Thinking

N=201

Question Structure	Frequency	Chi Sq Statistic	Level of Significance
Why Does...	95	74.70	***

Significant Responses Differentiated Intuition-Thinking

N=107

Why Does...	48	33.06	***

Significant Responses all Sensing-Feeling

N=52

Question Structure	Frequency	Chi Sq Statistic	Level of Significance
----	----	----	----

Significant Responses Differentiated Sensing-Feeling

N=26

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4 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

Question Stems Between all Intuition-Feeling and Sensing-Thinking

Question Structure	Chi Sq Statistic	Level of Significance
Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)		
----	----	----
Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)		
True/False	126.58	***
Why Does...	96.97	***

Question Stems Between Differentiated Intuition-Feeling and Sensing-Thinking

Question Structure	Chi Sq Statistic	Level of Significance
Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)		
----	----	----
Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)		
True/False	94.12	***
Why Does...	54.84	***

Question Stems Between all Intuition-Thinking and Sensing-Feeling

Question Structure	Chi Sq Statistic	Level of Significance
Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Why Does...	23.89	***
Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)		
----	----	----

Question Stems Between Differentiated Intuition-Thinking and Sensing-Feeling

Question Structure	Chi Sq Statistic	Level of Significance
Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Why Does...	10.97	*
Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)		
----	----	----

4 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

Appendix F - Frequency of Visits to Faculty

F.1.a.

Frequency of Visits to Course Instructor (Extraverts, Introverts), Within Each

Significant Responses Extraverts, Visit Course Instructor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once During Course	113	170.34	***
(N=283)	Once a Month	75	44.38	***
Differentiated	Once During Course	94	136.53	***
(N=240)	Once a Month	66	43.2	***

Significant Responses Introverts, Visit Course Instructor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once During Course	178	310.72	***
(N=412)	Once a Month	95	36.74	***
Differentiated	Once During Course	110	183.51	***
(N=261)	Once a Month	64	30.17	***

Significant Responses Total Undifferentiated (Es and Is), Visit Course Instructor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Es and Is (N=194)	Once During Course	87	162.37	***

Frequency of Visits to Course Instructor (Extraverts, Introverts), Between Each

Significant Responses Between All Extraverts and Introverts			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Extravert	Once a Month	108.32	***
Introvert	Once During a Course	163.43	***

Significant Responses Between Differentiated Extraverts and Introverts			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Extravert	Once a Month	70.88	***
Introvert	Once During a Course	101.15	***

Significant Responses Between Total Undifferentiated and Differentiated Extraverts and Introverts			
Significant Undifferentiated Responses			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Undiff to Extravert	Once During Course	80.86	***
Significant Differentiated Responses			
Diff to Extravert	Once a Month	86.79	***
Diff to Introvert	Once a Month	74.77	***
	Once a Course	102.03	***

7 Degrees of Freedom

Test Stat	Level of Significance	Symbol
14.07	$p < .05$	*
18.48	$p < .01$	**
24.32	$p < .001$	***

Frequency of Visits to Course Instructor (Sensing, Intuition), Within Each

Significant Responses **Intuition**, Visit Course Instructor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All (N=266)	Once During Course	123	242.26	***
Differentiated (N=197)	Once During Course	91	178.91	***

Significant Responses **Sensing**, Visit Course Instructor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once During Course	168	243.95	***
(N=429)	Once a Month	120	82.16	***
Differentiated	Once During Course	143	219.20	***
(N=355)	Once a Month	98	64.80	***

Significant Responses **Total Undifferentiated (Ss and Ns)**, Visit Course Instructor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns	Once During Course	57	85.64	***
(N=143)	Once a Month	36	18.38	*

Frequency of Visits to Course Instructor (Sensing, Intuition), Between Each

Significant Responses Between **All Sensing and Intuition**			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Sensing	Once During a Course	197.53	***
	Once a Month	79.15	***
Intuition	---	---	---

Significant Responses Between **Differentiated Intuition and Sensing**			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Sensing	Once During a Course	163.11	***
	Once a Month	63.36	***
Intuition	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Sensing and Intuition**			
Significant Undifferentiated Responses			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Undiff to Intuition	Once During Course	104.08	***
Significant Differentiated Responses			
Diff to Sensing	Once a Month	104.98	***
	Once a Course	142.03	***
Diff to Intuition	Once a Month	24.75	***

7 Degrees of Freedom

Test Stat	Level of Significance	Symbol
14.07	$p < .05$	*
18.48	$p < .01$	**
24.32	$p < .001$	***

Frequency of Visits to Course Instructor (Thinking, Feeling), Within Each

Significant Responses Thinking, Visit Course Instructor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once During Course	236	371.13	***
(N=578)	Once a Month	149	81.53	***
Differentiated	Once During Course	200	309.52	***
(N=494)	Once a Month	128	71.08	***

Significant Responses Feeling, Visit Course Instructor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All (N=117)	Once During Course	55	111.46	***
Differentiated (N=70)	Once During Course	31	56.57	***

Significant Responses Total Undifferentiated (Ts and Fs), Visit Course Instructor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs	Once During Course	60	116.22	***

Frequency of Visits to Course Instructor (Thinking, Feeling), Between Each

Significant Responses Between All Thinking and Feeling			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Thinking	Once During a Course	270.84	***
	Once a Month	102.31	***
Feeling	----	----	----

Significant Responses Between Differentiated Thinking and Feeling			
Category	Frequency	Chi Sq Statistic	Level of Significance
Thinking	Once During a Course	217.86	***
	Once a Month	83.17	***
Feeling	----	----	----

Significant Responses Between Total Undifferentiated and Differentiated Thinking and Feeling			
Significant Undifferentiated Responses			
Category	Frequency	Chi Sq Statistic	Level of Significance
Undiff to Feeling	Once During Course	29.44	***
Significant Differentiated Responses			
Diff to Thinking	Once a Month	141.05	***
	Once a Quarter	173.01	***

7 Degrees of Freedom

Test Stat	Level of Significance	Symbol
14.07	$p < .05$	*
18.48	$p < .01$	**
24.32	$p < .001$	***

Frequency of Visits to Course Instructor (Judging, Perceiving), Within Each

Significant Responses **Judging**, Visit Course Instructor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once During Course	178	269.23	***
(N=445)	Once a Month	115	63.38	***
Differentiated	Once During Course	119	159.00	***
(N=317)	Once a Month	85	51.96	***

Significant Responses **Perceiving**, Visit Course Instructor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All (N=250)	Once During Course	113	213.86	***
Differentiated (N=170)	Once During Course	79	156.94	***

Significant Responses **Total Undifferentiated (Js and Ps)**, Visit Course Instructor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps	Once During Course	93	172.65	***
(N=208)	Once a Month	52	26.00	***

Frequency of Visits to Faculty (Judging, Perceiving), Between Each

Significant Responses Between **All Judging and Perceiving**			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Judging	Once During a Course	98.87	***
	Once a Month	63.76	***
Perceiving	----	----	----

Significant Responses Between **Differentiated Judging and Perceiving**			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Judging	Once During a Course	62.58	***
	Once a Month	44.86	***
Perceiving	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Judging and Perceiving**			
Significant Undifferentiated Responses			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Undiff to Judging	Once During Course	98.39	***
Undiff to Perceive	Once During Course	81.29	***
	Once a Month	24.81	***
Significant Differentiated Responses			
Diff to Judging	Once a Month	89.64	***

7 Degrees of Freedom

Test Stat	Level of Significance	Symbol
14.07	$p < .05$	*
18.48	$p < .01$	**
24.32	$p < .001$	***

F.1.b.
Frequency of Visits to Academic Advisor (Extraverts, Introverts), Within Each

Significant Responses Extraverts, Visit Academic Advisor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Month	116	183.76	***
(N=283)	Once Crse/Prgm	95	100.49	***
Differentiated	Once Month	98	154.13	***
(N=240)	Once Crse/Prgm	81	86.7	***

Significant Responses Introverts, Visit Academic Advisor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Month	98	245.75	***
(N=412)	Once Crse/Prgm	81	155.54	***
Differentiated	Once Month	164	166.33	***
(N=261)	Once Crse/Prgm	141	104.53	***

Significant Responses Total Undifferentiated (Es and Is), Visit Academic Advisor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Es and Is	Once Month	82	137.53	***
(N=194)	Once Crse/Prgm	69	82.58	***

Frequency of Visits to Academic Advisor (Extraverts, Introverts), Between Each

Significant Responses Between All Extraverts and Introverts			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Extravert	----	----	----
Introvert	Once a Month	167.91	***
	Once During a Course	137.28	***

Significant Responses Between Differentiated Extraverts and Introverts			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Extravert	----	----	----
Introvert	Once a Month	105.64	***
	Once During a Course	87.11	***

Significant Responses Between Total Undifferentiated and Differentiated Extraverts and Introverts Significant Differentiated Responses			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Diff to Extravert	Once a Month	93.44	***
	Once During Course	75.62	***
Diff to Introvert	Once a Month	89.30	***
	Once a Quarter	78.33	***

7 Degrees of Freedom

Test Stat	Level of Significance	Symbol
14.07	$p < .05$	*
18.48	$p < .01$	**
24.32	$p < .001$	***

Frequency of Visits to Academic Advisor (Sensing, Intuition), Within Each

Significant Responses **Sensing**, Visit Academic Advisor

Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Month	172	261.31	***
(N=429)	Once Crse/Prgm	152	180.47	***
Differentiated	Once Month	142	559.47	***
(N=355)	Once Crse/Prgm	127	425.61	***

Significant Responses **Intuition**, Visit Academic Advisor

Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Month	108	168.05	***
(N=266)	Once Crse/Prgm	84	77.46	***
Differentiated	Once Month	78	115.69	***
(N=197)	Once Crse/Prgm	66	69.52	***

Significant Responses **Total Undifferentiated (Ss and Ns)**, Visit Academic Advisor

Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns	Once Crse/Prgm	60	35.32	***
	Once Month	43	19.27	**

Frequency of Visits to Academic Advisor (Sensing, Intutition), Between Each

Significant Responses Between **All Intuition and Sensing**

Category	Occurrence	Chi Sq Statistic	Level of Significance
Sensing	Once a Month	173.19	***
	Once During a Course	134.35	***
Intuition	---	---	---

Significant Responses Between **Differentiated Intuition and Sensing**

Category	Occurrence	Chi Sq Statistic	Level of Significance
Sensing	Once a Month	139.55	***
	Once During a Course	117.87	***
Intuition	----	---	---

Significant Responses Between **Total Undifferentiated and Differentiated Sensing and Intuition**

Significant Differentiated Responses

Category	Occurrence	Chi Sq Statistic	Level of Significance
Diff to Intuition	Once a Month	72.23	***
	Once During Course	72.16	***
Diff to Sensing	Once a Month	132.89	***
	Once During Course	148.61	***

7 Degrees of Freedom

Test Stat	Level of Significance	Symbol
14.07	$p < .05$	*
18.48	$p < .01$	**
24.32	$p < .001$	***

Frequency of Visits to Academic Advisor (Thinking, Feeling), Within Each

Significant Responses Thinking, Visit Academic Advisor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Month	230	344.43	***
(N=578)	Once Crse/Prgm	197	215.40	***
Differentiated	Once Month	189	371.32	***
(N=494)	Once Crse/Prgm	171	300.80	***

Significant Responses Feeling, Visit Academic Advisor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Month	50	85.57	***
(N=117)	Once Crse/Prgm	39	40.63	***
Differentiated	Once Month	32	61.77	***
(N=70)	Once Crse/Prgm	25	30.18	***

Significant Responses Total Undifferentiated (Ts and Fs), Visit Academic Advisor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs	Once Month	59	110.96	***
	Once Crse/Prgm	40	34.08	***

Frequency of Visits to Academic Advisor (Thinking, Feeling), Between Each

Significant Responses Between All Thinking and Feeling			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Thinking	Once a Month	246.08	***
	Once During a Course	191.64	***
Feeling	----	----	----

Significant Responses Between Differentiated Thinking and Feeling			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Thinking	Once a Month	224.99	***
	Once During a Course	175.46	***
Feeling	----	----	----

Significant Responses Between Total Undifferentiated and Differentiated Thinking and Feeling			
Significant Undifferentiated Responses			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Undiff to Feeling	Once a Month	31.95	***
	Once During a Course	28.71	***
Significant Differentiated Responses			
Diff to Thinking	Once a Month	156.78	***
	Once During a Course	190.08	***

7 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	14.07	$p < .05$	*
	18.48	$p < .01$	**
	24.32	$p < .001$	***

Frequency of Visits to Academic Advisor (Judging, Perceiving), Within Each

Significant Responses **Judging**, Visit Academic Advisor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Month	180	278.10	***
(N=445)	Once Crse/Prgm	152	166.98	***
Differentiated	Once Month	127	192.67	***
(N=317)	Once Crse/Prgm	108	117.98	***

Significant Responses **Perceiving**, Visit Academic Advisor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Month	100	151.25	***
(N=250)	Once Crse/Prgm	84	89.04	***
Differentiated (N=170)	Once Month	73	28.11	***

Significant Responses **Total Undifferentiated (Js and Ps)**, Visit Academic Advisor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps	Once Month	80	112.15	***
(N=208)	Once Crse/Prgm	74	88.62	***

Frequency of Visits to Academic Advisor (Judging, Perceiving), Between Each

Significant Responses Between **All Judging and Perceiving**			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Judging	Once a Month	100.13	***
	Once During a Course	84.41	***
Perceiving	----	----	----

Significant Responses Between **Differentiated Judging and Perceiving**			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Judging	Once a Month	67.04	***
	Once During a Course	56.99	***
Perceiving	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Judging and Perceiving**			
Significant Undifferentiated Responses			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Undiff to Perceiving	Once a Month	80.69	***
	Once During a Course	47.40	***
Significant Differentiated Responses			
Diff to Judging	Once a Month	130.76	***
	Once During a Course	101.90	***

7 Degrees of Freedom

Test Stat	Level of Significance	Symbol
14.07	$p < .05$	*
18.48	$p < .01$	**
24.32	$p < .001$	***

F.1.c.

Frequency of Visits to Option Manager (Extraverts, Introverts), Within Each

Significant Responses Extraverts, Visit Option Manager

Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Never	81	58.84	***
(N=283)	Once Month	72	37.92	***
	Once Crse/Prgm	70	33.89	***
Differentiated	Never	67	45.63	***
(N=240)	Once Month	62	34.13	***
	Once Crse/Prgm	61	32.03	***

Significant Responses Introverts, Visit Option Manager

Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Never	126	107.77	***
(N=412)	Once Crse/Prgm	122	96.51	***
	Once Month	88	25.87	***
Differentiated	Never	81	71.73	***
(N=261)	Once Crse/Prgm	75	55.04	***
Undifferentiated	Once Month	37	17.40	* (N=151)

Significant Responses Total Undifferentiated (Es and Is), Visit Option Manager

Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Es and Is	Once Month	59	21.34	**
(N=194)	Once Crse/Prgm	56	41.57	***
	Never Crse/Prgm	47	49.80	***

Frequency of Visits to Option Manager (Extraverts, Introverts), Between Each

Significant Responses Between All Extraverts and Introverts

Category	Occurrence	Chi Sq Statistic	Level of Significance
Extravert	Once a Month	103.98	***
Introvert	Never	116.85	***
	Once During a Course	100.71	***

Significant Responses Between Differentiated Extraverts and Introverts

Category	Occurrence	Chi Sq Statistic	Level of Significance
Extravert	Once a Month	66.67	***
Introvert	Never	71.75	***
	Once During a Course	65.20	***

Significant Responses Between Total Undifferentiated and Differentiated Extraverts and Introverts

Category	Occurrence	Chi Sq Statistic	Level of Significance
Undiff to Extravert	Once During Course	52.47	***
	Never	60.26	***
Undiff to Introvert	Once a Month	39.79	***
	Once During Course	73.32	***
	Never	81.31	***
Diff to Extravert	Once a Month	68.87	***

7 Degrees of Freedom	14.07	$p < .05$	*
	18.48	$p < .01$	**
	24.32	$p < .001$	***

Frequency of Visits to Option Manager (Sensing, Intuition), Within Each

Significant Responses Sensing, Visit Option Manager

Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Never	128	103.15	***
	Once Crse/Prgm	125	95.00	***
	Once Month	92	27.46	***
Differentiated	Never	107	88.38	***
	Once Crse/Prgm	103	77.45	***
	Once Month	80	28.60	***

Significant Responses Intuition, Visit Option Manager

Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Never	79	62.95	***
(N=266)	Once Month	68	36.32	***
	Once Crse/Prgm	67	34.26	***
Differentiated	Never	64	62.96	***
	Once Crse/Prgm	48	22.19	**
Undifferentiated	Once Month	25	31.09	***

Significant Responses Total Undifferentiated (Ss and Ns), Visit Option Manager

Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns	Once Month	41	20.46	**
(N=143)	Once Crse/Prgm	37	29.92	***
	Never	36	18.38	*

Frequency of Visits to Option Manager (Sensing, Intuition), Between Each

Significant Responses Between All Sensing and Intuition

Category	Occurrence	Chi Sq Statistic	Level of Significance
Sensing	Never	126.41	***
	Once During a Course	106.90	***
Intuition	Once a Month	108.83	***

Significant Responses Between Differentiated Sensing and Intuition

Category	Occurrence	Chi Sq Statistic	Level of Significance
Sensing	Never	114.40	***
	Once During a Course	85.31	***
	Once a Month	76.45	***
Intuition	----	----	----

Significant Responses Between Total Undifferentiated and Differentiated Sensing and Intuition

Category	Occurrence	Chi Sq Statistic	Level of Significance
Undiff to Intuition	Once a Month	34.90	***
	Once During a Course	39.41	***
Diff to Sensing	Once a Month	67.19	***
	Once During Course	101.75	***
	Never	125.62	***
Diff to Intuition	Never	81.21	***

7 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	14.07	$p < .05$	*
	18.48	$p < .01$	**
	24.32	$p < .001$	***

Frequency of Visits to Option Manager (Thinking, Feeling), Within Each

Significant Responses Thinking, Visit Option Manager				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Never	176	148.98	***
(N=578)	Once Crse/Prgm	156	97.08	***
	Once a Month	131	47.77	***
Differentiated	Never	155	140.82	***
(N=494)	Once Crse/Prgm	135	86.89	***
	Once a Month	105	30.29	***

Significant Responses Feeling, Visit Option Manager				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Crse/Prgm	36	31.24	***
(N=117)	Never	31	18.33	*
	Once Month	29	14.12	*
Differentiated	Once Crse/Prgm	21	17.15	* (N=70)

Significant Responses Total Undifferentiated (Ts and Fs), Visit Option Manager				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs	Once a Month	36	23.52	**
(N=131)	Once Crse/Prgm	36	23.52	**
	Never	35	21.18	**

Frequency of Visits to Option Manager (Thinking, Feeling), Between Each

Significant Responses Between All Thinking and Feeling			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Thinking	Once During a Course	176.97	***
	Never	151.99	***
	Once a Month	142.35	***
Feeling	----	----	----
Significant Responses Between Differentiated Thinking and Feeling			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Thinking	Once During a Course	147.29	***
	Once a Month	133.68	***
	Never	118.68	***
Feeling	----	----	----

Significant Responses Between Total Undifferentiated and Differentiated Thinking & Feeling			
Significant Undifferentiated Responses			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Undiff to Feeling	Once a Month	18.23	*
	Once During Course	22.39	**
	Never	14.92	*
Signifincant Differentiated Responses			
Diff to Thinking	Once a Month	77.44	***
	Once During Course	130.48	***
	Never	178.26	***

7 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	14.07	$p < .05$	*
	18.48	$p < .01$	**
	24.32	$p < .001$	***

Frequency of Visits to Option Manager (Judging, Perceiving) Within Each

Significant Responses **Judging**, Visit Option Manager				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Never	130	99.45	***
(N=445)	Once Crse/Prgm	114	61.26	***
	Once a Month	108	49.31	***
Differentiated	Never	92	69.23	***
(N=317)	Once a Month	81	43.20	***
	Once Crse/Prgm	78	37.16	***

Significant Responses **Perceiving**, Visit Option Manager				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Crse/Prgm	78	69.94	***
(N=250)	Never	77	66.97	***
Differentiated	Never	57	60.14	***
(N=170)	Once Crse/Prgm	55	53.60	***

Significant Responses **Total Undifferentiated (Js and Ps)**, Visit Option Manager				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps	Once Crse/Prgm	59	41.88	***
(N=208)	Never	58	39.38	***

Frequency of Visits to Option Manager (Judging, Perceiving), Between Each

Significant Responses Between **All Judging and Perceiving**			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Judging	Never	71.98	***
	Once a Month	59.82	***
Perceiving	Once During a Course	62.83	***

Significant Responses Between **Differentiated Judging and Perceiving**			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Judging	Never	48.18	***
	Once a Month	42.66	***
Perceiving	Once During a Course	40.51	***

Significant Responses Between **Total Undifferentiated and Differentiated Judging & Perceiving**			
Significant Undifferentiated Responses			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Undiff to Judging	Once During a Course	66.14	***
Significant Differentiated Responses			
Diff to Judging	Once a Month	94.14	***
	Never	94.23	***
Diff to Perceive	Once During a Course	61.91	***
	Never	67.72	***

7 Degrees of Freedom

Test Stat	Level of Significance	Symbol
14.07	$p < .05$	*
18.48	$p < .01$	**
24.32	$p < .001$	***

F.1.d.

Frequency of Visits to Thesis Advisor (Extraverts, Introverts) Within Each

Significant Responses **Extraverts**, Visit Thesis Advisor

Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Two Weeks	93	93.87	***
(N=283)	Once a Week	84	66.84	***
	Once a Month	59	15.78	*
Differentiated	Once Two Weeks	78	76.80	***
(N=240)	Once a Week	72	58.80	***
	Once a Month	53	17.63	*

Significant Responses **Introverts**, Visit Thesis Advisor

Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Two Weeks	147	177.09	***
(N=412)	Once a Week	111	68.74	***
	Once a Month	93	33.44	***
Differentiated	Once Two Weeks	93	111.73	***
(N=261)	Once a Week	75	55.04	***
Undifferentiated	Once a Month	39	21.46	** (N=151)

Significant Responses **Total Undifferentiated (Es and Is)**, Visit Thesis Advisor

Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Es and Is	Once Two Weeks	48	82.58	***
(N=194)	Once a Week	69	23.26	**
	Once a Month	45	17.76	*

Frequency of Visits to Thesis Advisor (Extraverts, Introverts), Between Each

Significant Responses Between **All Extraverts and Introverts**

Category	Occurrence	Chi Sq Statistic	Level of Significance
Extravert	----	----	----
Introvert	Once in Two Weeks	134.31	***
	Once a Week	121.38	***
	Once a Month	84.81	***

Significant Responses Between **Differentiated Extraverts and Introverts**

Category	Occurrence	Chi Sq Statistic	Level of Significance
Extravert	Once a Week	77.34	***
	Once a Month	56.70	***
Introvert	Once in Two Weeks	83.73	***

Significant Responses Between **Total Undifferentiated and Differentiated Extraverts & Introverts**

Category	Occurrence	Chi Sq Statistic	Level of Significance
Undiff to Extravert	Once in Two Weeks	52.47	***
	Once a Month	60.26	***
Undiff to Introvert	Once a Week	39.79	***
	Once in Two Weeks	73.32	***
	Once a Month	81.31	***
Diff to Extravert	Once a Week	68.87	***

7 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	14.07	$p < .05$	*
	18.48	$p < .01$	**
	24.32	$p < .001$	***

Frequency of Visits to Thesis Advisor (Sensing, Intuition), Within Each

Significant Responses **Sensing**, Visit Thesis Advisor

Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Two Weeks	150	173.21	***
(N=429)	Once a Week	120	82.16	***
	Once a Month	91	26.05	***
Differentiated	Once Two Weeks	118	122.16	***
(N=355)	Once a Week	99	67.24	***
	Once a Month	77	23.99	**

Significant Responses **Intuition**, Visit Thesis Advisor

Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Two Weeks	90	96.85	***
(N=266)	Once a Week	75	52.42	***
	Once a Month	61	23.16	**
Differentiated	Once a Week	62	56.73	***
(N=197)	Once Two Weeks	58	45.23	***

Significant Responses **Total Undifferentiated (Ss and Ns)**, Visit Thesis Advisor

Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns	Once a Week	38	44.46	***
(N=143)	Once Two Weeks	60	88.62	***

Frequency of Visits to Thesis Advisor (Sensing, Intuition), Between Each

Significant Responses Between **All Sensing and Intuition**

Category	Occurrence	Chi Sq Statistic	Level of Significance
Sensing	Once in Two Weeks	144.12	***
	Once a Week	119.97	***
	Once a Month	97.45	***
Intuition	----	----	----

Significant Responses Between **Differentiated Sensing and Intuition**

Category	Occurrence	Chi Sq Statistic	Level of Significance
Sensing	Once in Two Weeks	110.67	***
	Once a Week	103.57	***
	Once a Month	76.49	***
Intuition	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Sensing & Intuition**

Significant Undifferentiated Responses

Category	Occurrence	Chi Sq Statistic	Level of Significance
Undiff to Sensing	Once a Week	33.46	***
	Once in Two Weeks	58.71	***

Significant Differentiated Responses

Category	Occurrence	Chi Sq Statistic	Level of Significance
Diff to Intuition	Once a Week	95.11	***
	Once in Two Weeks	98.10	***
	Once a Month	63.43	***
Diff to Sensing	Once a Month	48.24	***

7 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	14.07	$p < .05$	*
	18.48	$p < .01$	**
	24.32	$p < .001$	***

Frequency of Visits to Thesis Advisor (Thinking, Feeling), Within Each

Significant Responses Thinking, Visit Thesis Advisor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Two Weeks	197	215.40	***
(N=578)	Once a Week	166	121.65	***
	Once a Month	131	47.77	***
Differentiated	Once Two Weeks	163	166.02	***
(N=494)	Once a Week	144	109.56	***
	Once a Month	117	49.43	**

Significant Responses Feeling, Visit Thesis Advisor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Two Weeks	43	55.05	***
(N=117)	Once a Week	29	14.13	*
Differentiated	OnceTwo Weeks	28	42.35	***
(N=70)				

Significant Responses Total Undifferentiated (Ts and Fs), Visit Thesis Advisor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs	Once Two Weeks	49	65.00	***
(N=131)	Once a Week	35	21.18	**

Frequency of Visits to Thesis Advisor (Thinking, Feeling) Between Each

Significant Responses Between All Thinking and Feeling			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Thinking	Once in Two Weeks	211.5	***
	Once a Week	142.11	***
	Once a Month	102.48	***
Feeling	----	----	----

Significant Responses Between Differentiated Thinking and Feeling			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Thinking	Once in Two Weeks	196.78	***
	Once a Week	111.64	***
	Once a Month	97.62	***
Feeling	----	----	----

Significant Responses Between Total Undifferentiated and Differentiated Thinking & Feeling			
Significant Undifferentiated Responses			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Undiff to Thinking	Once in Two Weeks	140.02	***
Undiff to Feeling	Once in Two Weeks	29.41	***
Significant Differentiated Responses			
Diff to Thinking	Once a Week	153.34	***
	Once a Month	169.09	***

7 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	14.07	$p < .05$	*
	18.48	$p < .01$	**
	24.32	$p < .001$	***

Frequency of Visits to Thesis Advisor (Judging, Perceiving) Within Each

Significant Responses Judging, Visit Thesis Advisor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Two Weeks	156	181.13	***
(N=445)	Once a Week	131	102.14	***
	Once a Month	92	23.78	**
Differentiated	Once Two Weeks	106	111.18	***
(N=317)	Once a Week	94	74.62	***

Significant Responses Perceiving, Visit Thesis Advisor				
Category	Occurrence	Frequency	Chi Sq Statistic	Level of Significance
All	Once Two Weeks	84	89.04	***
(N=250)	Once a W[illegible]	64	34.32	***
	Once a Mon[illegible]	60	26.45	***
Differentiated	Once Two Weeks	60	70.66	***
(N=170)	Once a Month	42	20.26	**
	Once a Week	41	18.36	*
Undifferentiated	Once a Week	23	16.90	*
(N=80)				

Significant Responses Total Undifferentiated (Js and Ps), Visit Thesis Advisor			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Js and Ps	Once a Week	44.46	***
	Once Two Weeks	88.62	***

Frequency of Visits to Thesis Advisor (Judging, Perceiving) Between Each

Significant Responses Between All Judging and Perceiving			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Judging	Once a Month	50.52	***
Perceiving	Once in Two Weeks	86.68	***
	Once a Week	72.73	***

Significant Responses Between Differentiated Judging and Perceiving			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Judging	Once a Month	34.21	***
Perceiving	Once in Two Weeks	55.79	***
	Once a Week	49.60	***

Significant Responses Between Total Undifferentiated and Differentiated Judging & Perceiving			
Category	Occurrence	Chi Sq Statistic	Level of Significance
Undiff to Judging	Once a Week	95.11	***
	Once in Two Weeks	98.11	***
Undiff to Perceive	Once a Week	33.46	***
	Once in Two Weeks	58.71	***
Diff to Judge	Once a Month	63.44	***
Diff to Perceive	Once a Month	48.24	***

7 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	14.07	$p < .05$	*
	18.48	$p < .01$	**
	24.32	$p < .001$	***

F.2.a.

Frequency of Visits to Course Instructor (Intuition-Thinking & Sensing-Feeling)

Significant Responses all **Intuition-Thinking** (N=201)

Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Once During Course	90	167.51	***

Significant Responses Differentiated **Intuition-Thinking** (N=107)

Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Once During Course	43	65.62	***

Significant Responses all **Sensing-Feeling** (N=52)

Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Once During Course	22	36.96	***

Frequency of Visits to Course Instructor (Intuition-Feeling & Sensing-Thinking)

Significant Responses all **Intuition-Feeling** (N=65)

Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Once During Course	33	76.16	***

Significant Responses all **Sensing-Thinking** (N=377)

Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Once During Course	146	207.45	***
Once a Month	109	81.24	***

Significant Responses Differentiated **Sensing-Thinking** (N=295)

Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Once During Course	123	201.15	***
Once a Month	81	52.80	***

Frequency of Visits to Course Instructor Between all Intuition-Thinking and Sensing-Feeling

Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)

Occurrence	Chi Sq Statistic	Level of Significance
Once During a Course	22.34	**

Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)

Occurrence	Chi Sq Statistic	Level of Significance
---	---	---

Frequency of Visits to Course Instructor Between all Intuition-Feeling and Sensing-Thinking

Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)

Occurrence	Chi Sq Statistic	Level of Significance
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Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)

Occurrence	Chi Sq Statistic	Level of Significance
Once During a Course	190.64	***
Once a Month	56.12	***

7 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	14.07	$p < .05$	*
	18.48	$p < .01$	**
	24.32	$p < .001$	***

F.2.b.

Frequency of Visits to Academic Advisor (Intuition-Thinking & Sensing-Feeling)

Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Significant Responses all Intuition-Thinking (N=201)			
Once a Month	81	124.26	***
Once a Course/Program	64	60.15	***
Significant Responses Differentiated Intuition-Thinking (N=107)			
Once a Month	37	41.73	***
Once a Course/Program	36	38.27	***

Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Significant Responses all Sensing-Feeling (N=52)			
Once a Month	23	41.88	***
Once During Course/Program	19	24.04	**

Frequency of Visits to Academic Advisor (Intuition-Feeling & Sensing-Thinking)

Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Significant Responses all Intuition-Feeling (N=65)			
Once a Month	27	43.85	***
Once a Course/Program	20	17.35	*

Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Significant Responses all Sensing-Thinking (N=377)			
Once a Month	149	220.23	***
Once During Course/Program	133	156.49	***
Significant Responses Differentiated Sensing-Thinking (N=295)			
Once a Month	117	330.25	***
Once During Course/Program	105	263.90	***

Frequency of Visits to Academic Advisor Between all Intuition-Thinking and Sensing-Feeling

Occurrence	Chi Sq Statistic	Level of Significance
Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Once a Month	19.86	**
Once During a Course	15.41	*
Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)		
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Frequency of Visits to Academic Advisor Between all Intuition-Feeling and Sensing-Thinking

Occurrence	Chi Sq Statistic	Level of Significance
Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)		
---	---	---
Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Once a Month	155.64	***
Once During a Course	114.85	***

7 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	14.07	$p < .05$	*
	18.48	$p < .01$	**
	24.32	$p < .001$	***

F.2.c.

Frequency of Visits to Option Manager (Intuition-Thinking & Sensing-Feeling)

Significant Responses all Intuition-Thinking (N=201)			
Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Never	59	45.67	***
Once a Month	55	35.52	***
Once During Course/Program	49	22.69	**
Significant Responses Differentiated Intuition-Thinking (N=107)			
Never	35	34.96	***

Significant Responses all Sensing-Feeling (N=52)			
Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Once During Course/Program	18	20.35	**

Frequency of Visits to Option Manager (Intuition-Feeling & Sensing-Thinking)

Significant Responses all Intuition-Feeling (N=65)			
Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Never	20	17.36	***

Significant Responses all Sensing-Thinking (N=377)			
Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Never	117	103.61	***
Once During Course/Program	107	76.07	***
Once a Month	76	17.69	***
Significant Responses Differentiated Sensing-Thinking (N=295)			
Never	91	79.44	***
Once During Course/Program	83	57.70	***
Once a Month	64	19.95	**

Frequency of Visits to Option Manager
Between all Intuition-Thinking and Sensing-Feeling

Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Occurrence	Chi Sq Statistic	Level of Significance
Never	14.54	*
Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)		
----	----	----

Frequency of Visits to Option Manager
Between all Intuition-Feeling and Sensing-Thinking

Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)		
Occurrence	Chi Sq Statistic	Level of Significance
----	----	----
Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Never	114.99	***
Once During Course/Program	103.38	***
Once a Month	74.39	***

7 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	14.07	$p < .05$	*
	18.48	$p < .01$	**
	24.32	$p < .001$	***

F.2.d.

Frequency of Visits to Thesis Advisor (Intuition-Thinking & Sensing-Feeling)

Significant Responses all **Intuition-Thinking** (N=201)			
Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Once in Two Weeks	72	87.45	***
Once a Week	55	35.52	***
Once a Month	49	22.69	**
Significant Responses Differentiated **Intuition-Thinking** (N=107)			
Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Once in Two Weeks	33	28.80	***
Once a Week	31	23.23	**

Significant Responses all **Sensing-Feeling** (N=52)			
Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Once in Two Weeks	25	52.65	***

Frequency of Visits to Thesis Advisor (Intuition-Feeling & Sensing-Thinking)

Significant Responses all **Intuition-Feeling** (N=65)			
Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Once a Week	20	17.36	*

Significant Responses all **Sensing-Thinking** (N=377)			
Occurrence	Frequency	Chi Sq Statistic	Level of Significance
Once in Two Weeks	125	128.69	***
Once a Week	111	86.58	***
Once a Month	82	25.81	***
Significant Responses Differentiated **Sensing-Thinking** (N=295)			
Once in Two Weeks	94	88.50	***
Once a Week	85	62.81	***
Once a Month	68	26.27	***

Frequency Visits Thesis Advisor Between all Intuition-Thinking & Sensing-Feeling

Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Occurrence	Chi Sq Statistic	Level of Significance
Once in Two Weeks	17.28	*
Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)		
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Frequency Visits Thesis Advisor Between all Intuition-Feeling & Sensing-Thinking

Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)		
Occurrence	Chi Sq Statistic	Level of Significance
---	---	---
Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Once in Two Weeks	115.04	***
Once a Month	103.20	***
Once a Week	86.39	***

7 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	14.07	$p < .05$	*
	18.48	$p < .01$	**
	24.32	$p < .001$	***

Appendix G - Adaptation to Academic Stress

G.1.a.

Feeling About Grade Point Average (Extraverts, Introverts), Within Each

Significant Responses **Extraverts**, Grade Point

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All (N=283)	About Right	157	178.09	***
Differentiated (N=240)	About Right	131	143.52	***

Significant Responses **Introverts**, Grade Point

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	About Right	195	153.87	***
(N=412)	Lower Than Should Be	132	29.86	***
Differentiated	About Right	128	110.07	***
(N=261)	Lower Than Should Be	80	14.81	*
Undifferentiated (N=151)	Lower Than Should Be	52	15.73	**

Significant Responses **Total Undifferentiated (Es and Is)**, Grade Point

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Es and Is	About Right	82	75.71	***
(N=194)	Lower Than Should Be	69	12.70	*

Feeling About Grade Point Average (Extraverts, Introverts), Between Each

Significant Responses Between **All Extraverts and Introverts**

Category	Response	Chi Sq Statistic	Level of Significance
Extravert	About Right	227.71	***
Introvert	Lower Than Should Be	102.09	***

Significant Responses Between **Differentiated Extraverts and Introverts**

Category	Response	Chi Sq Statistic	Level of Significance
Extravert	About Right	141.56	***
Introvert	Lower Than Should Be	66.24	***

Significant Responses Between **Total Undifferentiated and Differentiated Extraverts & Introverts**

Significant Undifferentiated Responses

Category	Response	Chi Sq Statistic	Level of Significance
Undiff to Extravert	Lower Than Should Be	49.70	***
	Significant Differentiated Responses		
Diff to Extravert	About Right	147.92	***
Diff to Introvert	About Right	129.60	***
	Lower Than Should Be	76.64	***

4 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	9.488	$p < .05$	*
	13.28	$p < .01$	**
	18.47	$p < .001$	***

Feeling About Grade Point Average (Sensing, Intuition), Within Each

Significant Responses Sensing, Grade Point				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	About Right	224	222.60	***
(N=429)	Lower Than Should Be	134	27.08	***
Differentiated	About Right	184	179.85	***
(N=355)	Lower Than Should Be	112	23.68	***

Significant Responses Intuition, Grade Point				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All (N=266)	About Right	128	105.17	***
Differentiated (N=197)	About Right	93	72.92	***

Significant Responses Total Undifferentiated (Ss and Ns), Grade Point				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns (N=143)	About Right	75	75.28	***

Feeling About Grade Point Average (Sensing, Intuition), Between Each

Significant Responses Between All Sensing and Intuition			
Category	Response	Chi Sq Statistic	Level of Significance
Sensing	About Right	205.35	***
	Lower Than Should Be	110.08	***
Intuition	---	---	---

Significant Responses Between Differentiated Sensing and Intuition			
Category	Response	Chi Sq Statistic	Level of Significance
Sensing	About Right	166.49	***
	Lower Than Should Be	97.98	***
Intuition	----	----	----

Significant Responses Between Total Undifferentiated and Differentiated Sensing & Intuition			
Significant Undifferentiated Responses			
Category	Response	Chi Sq Statistic	Level of Significance
Undiff to Intuition	About Right	82.33	***
Significant Differentiated Responses			
Diff to Sensing	About Right	179.35	***
	Lower Than Should Be	137.88	***
Diff to Intuition	Lower Than Should Be	59.62	***

4 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

Feeling About Grade Point Average (Thinking, Feeling), Within Each

Significant Responses **Thinking**, Grade Point				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	About Right	295	278.41	***
(N=578)	Lower Than Should Be	168	23.75	***
Differentiated	About Right	248	225.31	***
(N=494)	Lower Than Should Be	145	21.60	***

Significant Responses **Feeling**, Grade Point				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	About Right	57	48.25	***
(N=117)				
Differentiated	About Right	33	25.79	***

Significant Responses **Total Undifferentiated (Ts and Fs)**, Grade Point				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs	About Right	71	76.60	***
(N=131)				

Feeling About Grade Point Average (Thinking, Feeling), Between Each

Significant Responses Between All Thinking and Feeling			
Category	Response	Chi Sq Statistic	Level of Significance
Thinking	About Right	280.54	***
	Lower Than Should Be	171.93	***
Feeling	----	----	----

Significant Responses Between **Differentiated Thinking and Feeling**			
Category	Response	Chi Sq Statistic	Level of Significance
Thinking	About Right	231.82	***
	Lower Than Should Be	140.12	***
Feeling	----	----	----

Significant Responses Between **Total Undifferentiated** and **Differentiated Thinking & Feeling** Significant Differentiated Responses			
Category	Response	Chi Sq Statistic	Level of Significance
Diff to Thinking	About Right	225.94	***
	Lower Than Should Be	142.95	***
Diff to Feeling	About Right	28.17	***

4 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

Feeling About Grade Point Average (Judging, Perceiving), Within Each

Significant Responses Judging, Grade Point				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	About Right	240	256.19	***
(N=445)	Lower Than Should Be	124	13.76	*
Differentiated	About Right	165	162.82	***
(N=317)	Lower Than Should Be	88	9.54	*

Significant Responses Perceiving, Grade Point				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	About Right	112	76.88	***
(N=250)	Lower Than Should Be	79	16.82	**
Differentiated (N=170)	About Right	77	54.38	***
Undifferentiated (N=80)	Lower Than Should Be	32	16.00	**

Significant Responses Total Undifferentiated (Js and Ps), Grade Point				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps	About Right	110	112.47	***
(N=208)	Lower Than Should Be	68	16.75	**

Feeling About Grade Point Average (Judging, Perceiving), Between Each

Significant Responses Between All Judging and Perceiving			
Category	Response	Chi Sq Statistic	Level of Significance
Judging	Lower Than Should Be	68.52	***
Perceiving	About Right	134.00	***

Significant Responses Between Differentiated Judging and Perceiving			
Category	Response	Chi Sq Statistic	Level of Significance
Judging	About Right	87.62	***
	Lower Than Should Be	46.20	***
Perceiving	----	----	----

Significant Responses Between Total Undifferentiated and Differentiated Judging & Perceiving			
Significant Undifferentiated Responses			
Category	Response	Chi Sq Statistic	Level of Significance
Undiff to Judging	Lower Than Should Be	73.20	***
Undiff to Perceive	About Right	65.13	***
	Lower Than Should Be	38.93	***
Significant Differentiated Responses			
Diff to Judging	About Right	160.87	***

4 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	9.488	$p < .05$	*
	13.28	$p < .01$	**
	18.47	$p < .001$	***

G.1.b.

Consider Dropping Program (Extravert, Introvert), Within Each

Significant Responses **Extravert**, Considered Dropping Program

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All (N=283)	No	265	308.77	***
Differentiated (N=240)	No	226	266.45	***

Significant Responses **Introvert**, Considered Dropping Program

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All (N=412)	No	364	374.11	***
Differentiated (N=261)	No	232	241.67	***

Significant Responses **Total Undifferentiated (Es and Is)**, Considered Dropping Program

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Es and Is (N=194)	No	171	174.85	***

Consider Dropping Program (Sensing, Intuition), Within Each

Significant Responses **Sensing**, Considered Dropping Program

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All (N=429)	No	429	419.76	***
Differentiated (N=355)	No	355	350.54	***

Significant Responses **Intuition**, Considered Dropping Program

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All (N=266)	No	241	261.72	***
Differentiated (N=197)	No	178	192.16	***

Significant Responses **Total Undifferentiated (Ss and Ns)**, Considered Dropping Program

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns (N=143)	No		138.78	***

2 Degrees of Freedom

Test Stat	Level of Significance	Symbol
5.991	$p < .05$	*
9.21	$p < .01$	**
13.82	$p < .001$	***

Consider Dropping Program (Thinking, Feeling), Within Each

Significant Responses Thinking, Considered Dropping Program

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All (N=578)	No	528	583.64	***
Differentiated (N=494)	No	450	494.42	***

Significant Responses Feeling, Considered Dropping Program

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All (N=117)	No	101	98.56	***
Differentiated (N=70)	No	60	57.62	***

Significant Responses Total Undifferentiated (Ts and Fs), Considered Dropping Program

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs (N=131)	No	119	129.96	***

Consider Dropping Program (Judging, Perceiving), Within Each

Significant Responses Judging, Considered Dropping Program

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All (N=445)	No	411	465.13	***
Differentiated (N=317)	No	291	325.06	***

Significant Responses Perceiving, Considered Dropping Program

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All (N=250)	No	218	217.62	***
Differentiated (N=170)	No	148	147.21	***

Significant Responses Total Undifferentiated (Js and Ps), Considered Dropping Program

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps (N=208)	No	190	210.01	***

2 Degrees of Freedom

Test Stat	Level of Significance	Symbol
5.991	$p < .05$	*
9.21	$p < .01$	**
13.82	$p < .001$	***

G.1.c.
Why Consider Dropping Program (Sensing and Thinking)

Significant Responses **Sensing**, Why Drop (If yes to Considered)

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All (N=41)	Other	17	21.20	**
Differentiated (N=33)	Other	15	22.44	**

Significant Responses **Thinking**, Why Drop (If yes to Considered)

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All (N=50)	Other	19	19.68	**
Differentiated (N=44)	Other	----	----	----

6 Degrees of Freedom

Test Stat	Level of Significance	Symbol
12.59	$p < .05$	*
16.81	$p < .01$	**
22.46	$p < .001$	***

G.1.d.

Courses Dropped/Added (Extraverts, Introverts), Within Each

Significant Responses **Extraverts**, Number Courses Dropped/Added

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	0	132	498.41	***
(N=283)	2	81	139.79	***
Differentiated	0	111	414.05	***
(N=240)	2	71	130.05	***

Significant Responses **Introverts**, Number Courses Dropped/Added

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	0	199	789.76	***
(N=412)	2	115	189.53	***
Differentiated	0	129	111.73	***
(N=261)	2	68	98.34	***

Significant Responses **Total Undifferentiated (Es and Is)**, Number Courses Dropped/Added

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Es and Is	0	91	346.39	***
(N=194)	2	57	103.14	***

Courses Dropped/Added (Extraverts, Introverts), Between Each

Significant Responses Between **All Extraverts and Introverts**

Category	Response	Chi Sq Statistic	Level of Significance
Extravert	---	---	---
Introvert	0	191.13	***
	2	116.95	***

Significant Responses Between **Differentiated Extraverts and Introverts**

Category	Response	Chi Sq Statistic	Level of Significance
Extravert	0	119.64	***
	2	76.33	***
Introvert	---	---	---

Significant Responses Between **Total Undifferentiated** and **Differentiated Extraverts & Introverts**

Significant Undifferentiated Responses

Category	Response	Chi Sq Statistic	Level of Significance
Undiff to Introvert	2	58.95	***
Significant Differentiated Responses			
Diff to Extravert	0	105.21	***
	2	70.25	***
Diff to Introvert	0	134.58	***

11 Degrees of Freedom

Test Stat	Level of Significance	Symbol
19.68	$p < .05$	*
24.73	$p < .01$	**
31.26	$p < .001$	***

Courses Dropped/Added (Sensing, Intuition) Within Each

Significant Responses **Sensing**, Number Courses Dropped/Added

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	0	197	727.32	***
(N=429)	2	129	243.24	***
Differentiated	0	170	666.48	***
(N=355)	2	110	218.60	***

Significant Responses **Intuition**, Number Courses Dropped/Added

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	0	134	564.21	***
(N=266)	2	67	106.86	***
Differentiated	0	100	425.55	***
(N=197)	2	50	68.70	***

Significant Responses **Total Undifferentiated (Ss and Ns)**, Number Courses Dropped/Added

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns	0	61	202.17	***
(N=143)	2	36	48.67	***

Courses Dropped/Added (Sensing, Intuition) Between Each

Significant Responses Between **All Sensing and Intuition**

Category	Response	Chi Sq Statistic	Level of Significance
Sensing	0	215.20	***
	2	106.86	***
Intuition	---	---	---

Significant Responses Between **Differentiated Sensing and Intuition**

Category	Response	Chi Sq Statistic	Level of Significance
Sensing	0	179.26	***
	2	88.89	***
Intuition	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Sensing & Intuition**

Category	Response	Chi Sq Statistic	Level of Significance
Significant Undifferentiated Responses			
Undiff to Intuition	0	117.62	***
Significant Differentiated Responses			
Diff to Sensing	0	188.36	***
	2	132.91	***
Diff to Intuition	2	49.03	***

11 Degrees of Freedom

Test Stat	Level of Significance	Symbol
19.68	$p < .05$	*
24.73	$p < .01$	**
31.26	$p < .001$	***

Courses Dropped/Added (Thinking, Feeling) Within Each

Significant Responses Thinking, Number Courses Dropped/Added

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	0	279	1106.24	***
(N=578)	2	161	264.32	***
Differentiated	0	236	922.11	***
(N=494)	2	136	218.46	***

Significant Responses Feeling, Number Courses Dropped/Added

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	0	52	183.08	***
(N=117)	2	35	65.39	***
Differentiated	0	34	136.00	***
(N=70)	2	20	34.40	***

Significant Responses **Total Undifferentiated (Ts and Fs)**, Number Courses Dropped/Added

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs	0	61	299.77	***
(N=131)	2	40	77.48	***

Courses Dropped/Added (Thinking, Feeling) Between Each

Significant Responses Between **All Thinking and Feeling**

Category	Response	Chi Sq Statistic	Level of Significance
Thinking	0	255.80	***
	2	171.97	***
Feeling	----	----	----

Significant Responses Between **Differentiated Thinking and Feeling**

Category	Response	Chi Sq Statistic	Level of Significance
Thinking	0	238.96	***
	2	140.18	***
Feeling	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Thinking & Feeling**

Category	Response	Chi Sq Statistic	Level of Significance
Significant Undifferentiated Responses			
Undiff to Feeling	0	34.93	***
Significant Differentiated Responses			
Diff to Thinking	0	238.35	***
	2	118.85	***

11 Degrees of Freedom

Test Stat	Level of Significance	Symbol
19.68	$p < .05$	*
24.73	$p < .01$	**
31.26	$p < .001$	***

Courses Dropped/Added (Judging, Perceiving), Within Each

Significant Responses **Judging**, Number Courses Dropped/Added

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	0	207	778.56	***
(N=445)	2	135	258.54	***
Differentiated	0	155	625.88	***
(N=317)	2	86	134.39	***

Significant Responses **Perceiving**, Number Courses Dropped/Added

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	0	123	501.03	***
(N=250)	2	61	77.44	***
Differentiated	0	84	344.24	***
(N=170)	2	44	62.83	***

Significant Responses **Total Undifferentiated (Js and Ps)**, Number Courses Dropped/Added

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps	0	91	313.08	***
(N=208)	2	66	136.64	***

Courses Dropped/Added (Judging, Perceiving) Between Each

Significant Responses Between **All Judging and Perceiving**

Category	Response	Chi Sq Statistic	Level of Significance
Judging	2	75.04	***
Perceiving	0	115.23	***

Significant Responses Between **Differentiated Judging and Perceiving**

Category	Response	Chi Sq Statistic	Level of Significance
Judging	2	45.17	***
Perceiving	0	82.11	***

Significant Responses Between **Total Undifferentiated and Differentiated Judging & Perceiving**

Category	Response	Chi Sq Statistic	Level of Significance
Significant Undifferentiated Responses			
Undiff to Judge	2	72.00	***
Undiff to Perceive	2	35.07	***
Significant Differentiated Responses			
Diff to Judge	0	171.71	***
Diff to Perceive	0	94.05	***

11 Degrees of Freedom

Test Stat	Level of Significance	Symbol
19.68	$p < .05$	*
24.73	$p < .01$	**
31.26	$p < .001$	***

G.1.e.

Change Learning Strategy (Extraverts, Introverts) Within Each

Significant Responses Extraverts, Change Learning Strategy				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	Perhaps	92	42.62	***
(N=283)	Yes, somewhat	90	38.89	***
Differentiated	Perhaps	79	38.03	***
(N=240)	Yes, somewhat	76	32.4	***

Significant Responses Introverts, Change Learning Strategy				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	Perhaps	132	58.41	***
(N=412)				
Differentiated	Perhaps	79	28.97	***
(N=261)				

Significant Responses Total Undifferentiated (Es and Is), Change Learning Strategy				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Es and Is	Perhaps	66	35.05	***
(N=194)				

Change Learning Strategy (Extraverts, Introverts) Between Each

Significant Responses Between All Extraverts and Introverts			
Category	Response	Chi Sq Statistic	Level of Significance
Extravert	Yes, somewhat	130.30	***
Introvert	Perhaps	132.95	***

Significant Responses Between Differentiated Extraverts and Introverts			
Category	Response	Chi Sq Statistic	Level of Significance
Extravert	Perhaps	84.99	***
	Yes, somewhat	81.92	***
Introvert	---	---	---

Significant Responses Between Total Undifferentiated and Differentiated Extraverts & Introverts Significant Differentiated Responses			
Category	Response	Chi Sq Statistic	Level of Significance
Diff to Extravert	Perhaps	75.20	***
	Yes, somewhat	94.05	***
Diff to Introvert	Perhaps	68.94	***

5 Degrees of Freedom

Test Stat	Level of Significance	Symbol
11.07	$p < .05$	*
15.09	$p < .01$	**
20.51	$p < .001$	***

Change Learning Strategy (Sensing, Intuition), Within Each

Significant Responses **Sensing**, Change Learning Strategy				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	Perhaps	136	58.19	***
(N=429)	Yes, somewhat	117	28.95	***
Differentiated	Perhaps	121	64.62	***
(N=355)	Yes, somewhat	86	12.17	*
Undifferentiated (N=74)	Yes, somewhat	31	28.25	***

Significant Responses **Intuition**, Change Learning Strategy				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	Perhaps	88	43.01	***
(N=266)	Yes, somewhat	68	12.63	*
Differentiated (N=197)	Perhaps	62	25.91	***

Significant Responses **Total Undifferentiated (Ss and Ns)**, Change Learning Strategy				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns	Yes, somewhat	50	28.73	***
(N=143)	Perhaps	41	12.36	*

Change Learning Strategy (Intuition, Sensing) Between Each

Significant Responses Between **AllSensing and Intuition**			
Category	Response	Chi Sq Statistic	Level of Significance
Sensing	Perhaps	140.97	***
	Yes, somewhat	108.60	***
Intuition	---	---	---

Significant Responses Between **Differentiated Sensing and Intuition**			
Category	Response	Chi Sq Statistic	Level of Significance
Intuition	----	----	----
Sensing	Perhaps	110.64	***
	Yes, somewhat	87.32	***

Significant Responses Between **Total Undifferentiated and Differentiated Sensing & Intuition**			
Significant Undifferentiated Responses			
Category	Response	Chi Sq Statistic	Level of Significance
Undiff to Sensing	Yes, somewhat	57.10	***
Undiff to Intuition	Yes, somewhat	33.48	***
Significant Differentiated Responses			
Diff to Sensing	Perhaps	141.36	***
Diff to Intuition	Perhaps	66.68	***

5 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	11.07	$p < .05$	*
	15.09	$p < .01$	**
	20.51	$p < .001$	***

Change Learning Strategy (Thinking, Feeling), Within Each

Significant Responses Thinking, Change Learning Strategy

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All (N=578)	Perhaps	191	93.02	***
	Yes, somewhat	156	36.95	***
Differentiated (N=494)	Perhaps	170	93.35	***
	Yes, somewhat	128	25.33	***

Significant Responses Feeling, Change Learning Strategy

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All (N=117)	---	----	----	----
Differentiated (N=70)	---	----	----	----

Significant Responses Total Undifferentiated (Ts and Fs), Change Learning Strategy

Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs (N=131)	Yes, somewhat	38	11.97	*

Change Learning Strategy (Thinking, Feeling), Between Each

Significant Responses Between All Thinking and Feeling

Category	Response	Chi Sq Statistic	Level of Significance
Thinking	Perhaps	161.85	***
	Yes, somewhat	142.18	***
Feeling	----	----	----

Significant Responses Between Differentiated Thinking and Feeling

Category	Response	Chi Sq Statistic	Level of Significance
Thinking	Perhaps	147.05	***
	Yes, somewhat	133.13	***
Feeling	----	----	----

Significant Responses Between Total Undifferentiated and Differentiated Thinking & Feeling

Significant Undifferentiated Responses

Category	Response	Chi Sq Statistic	Level of Significance
Undiff to Feeling	Yes, somewhat	24.47	***

Significant Differentiated Responses

Category	Response	Chi Sq Statistic	Level of Significance
Diff to Thinking	Perhaps	228.46	***
	Yes, somewhat	110.56	***

5 Degrees of Freedom

Test Stat	Level of Significance	Symbol
11.07	$p < .05$	*
15.09	$p < .01$	**
20.51	$p < .001$	***

Change Learning Strategy (Judging, Perceiving), Within Each

Significant Responses **Judging**, Change Learning Strategy				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All	Perhaps	138	54.94	***
(N=445)	Yes, somewhat	129	40.54	***
Differentiated	Yes, somewhat	99	40.34	***
(N=317)	Perhaps	92	29.04	***

Significant Responses **Perceiving**, Change Learning Strategy				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
All (N=250)	Perhaps	86	47.17	***
Differentiated (N=170)	Perhaps	56	27.02	***

Significant Responses **Total Undifferentiated (Js and Ps)**, Change Learning Strategy				
Category	Response	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps (N=208)	Perhaps	76	49.28	***

Change Learning Strategy (Judging, Perceiving), Between Each

Significant Responses Between **All Judging and Perceiving**			
Category	Response	Chi Sq Statistic	Level of Significance
Judging	Perhaps	76.42	***
	Yes, somewhat	71.70	***
Perceiving	----	----	----

Significant Responses Between **Differentiated Judging and Perceiving**			
Category	Response	Chi Sq Statistic	Level of Significance
Judging	Yes, somewhat	52.41	***
	Perhaps	48.20	***
Perceiving	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Judging & Perceiving**			
Significant Undifferentiated Responses			
Category	Response	Chi Sq Statistic	Level of Significance
Undiff to Judging	Perhaps	71.55	***
Undiff to Perceive	Perhaps	49.67	***
Significant Differentiated Responses			
Diff to Judging	Yes, somewhat	127.09	***

5 Degrees of Freedom

Test Stat	Level of Significance	Symbol
11.07	$p < .05$	*
15.09	$p < .01$	**
20.51	$p < .001$	***

G.1.f.

Top 3 Reasons Why Change Learning (Extraverts, Introverts), Within Each

Significant Responses **Extraverts**, Why Change Learning Strategy (Top 3 Reasons)				
Category	Response	Frequency	Chi Sq Statistic	Significance
All	Adaptation to Teaching	155	284.45	***
(N=567)	Professional Focus	137	199.95	***
	Influence Other Students	135	191.47	***
Differentiated	Adaptation to Teaching	132	239.46	***
(N=486)	Professional Focus	119	178.18	***
	Influence Other Students	118	173.84	***

Significant Responses **Introverts**, Why Change Learning Strategy (Top 3 Reasons)				
Category	Response	Frequency	Chi Sq Statistic	Significance
All	Adaptation to Teaching	199	364.27	***
(N=729)	Professional Focus	171	235.52	***
	Influence Other Students	164	207.70	***
Differentiated	Adaptation to Teaching	122	217.98	***
(N=453)	Professional Focus	108	153.24	***
	Influence Other Students	104	137.24	***

Significant Responses **Total Undifferentiated (Es and Is)**,				
Category	Response	Frequency	Chi Sq Statistic	Significance
Es and Is	Adaptation to Teaching	100	191.61	***
(N=357)	Professional Focus	81	89.36	***
	Influence Other Students	77	84.38	***

Change Learning Strategy (Extraverts, Introverts), Between Each

Significant Responses Between **All Extraverts and Introverts**			
Category	Response	Chi Sq Statistic	Level of Significance
Extravert	Adaptation to Teaching	198.29	***
	Professional Focus	175.17	***
	Influence Other Students	172.63	***
Introvert	----	----	----

Significant Responses Between **Differentiated Extraverts and Introverts**			
Category	Response	Chi Sq Statistic	Level of Significance
Extravert	Adaptation to Teaching	142.70	***
	Professional Focus	128.58	***
	Influence Other Students	127.51	***
Introvert	---	---	---

Significant Responses Between **Total Undifferentiated and Differentiated Extraverts & Introverts**			
Category	Response	Chi Sq Statistic	Level of Significance
Diff to Extravert	Adaptation to Teaching	139.61	***
	Professional Focus	144.93	***
	Influence Other Students	140.08	***
Diff to Introvert	Adaptation to Teaching	109.29	***
	Professional Focus	103.06	***
	Influence Other Students	105.69	***

12 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	22.36	$p < .05$	*
	27.69	$p < .01$	**
	34.53	$p < .001$	***

Change Learning Strategy (Sensing, Intuition), Within Each

Significant Responses **Sensing**, Why Change Learning Strategy (Top 3 Reasons)

Category	Response	Frequency	Chi Sq Statistic	Significance
All	Adaptation to Teaching	218	399.59	***
(N=798)	Influence Other Students	191	273.69	***
	Professional Focus	184	244.92	***
Differentiated	Adaptation to Teaching	179	329.21	***
(N=654)	Influence Other Students	157	226.27	***
	Professional Focus	150	197.56	***

Significant Responses **Intuition**, Why Change Learning Strategy (Top 3 Reasons)

Category	Response	Frequency	Chi Sq Statistic	Significance
All	Adaptation to Teaching	136	249.14	***
(N=498)	Professional Focus	124	191.68	***
	Influence Other Students	108	126.79	***
Differentiated	Adaptation to Teaching	98	175.59	***
(N=360)	Professional Focus	89	135.73	***
	Influence Other Students	71	67.73	***

Significant Responses **Total Undifferentiated (Ss and Ns)**,
Why Change Learning Strategy (Top 3 Reasons)

Category	Response	Frequency	Chi Sq Statistic	Significance
Ss and Ns	Adaptation to Teaching	77	141.02	***
(N=282)	Professional Focus	71	112.08	***
	Influence Other Students	69	103.17	***

Change Learning Strategy (Sensing, Intuition), Between Each

Significant Responses Between **All Sensing and Intuition**

Category	Response	Chi Sq Statistic	Level of Significance
Sensing	Adaptation to Teaching	216.93	***
	Professional Focus	197.78	***
	Influence Other Students	171.96	***
Intuition	---	---	---

Significant Responses Between **Differentiated Sensing and Intuition**

Category	Response	Chi Sq Statistic	Level of Significance
Sensing	Adaptation to Teaching	175.58	***
	Professional Focus	159.45	***
	Influence Other Students	126.72	***
Intuition	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Sensing & Intuition**

Category	Response	Chi Sq Statistic	Level of Significance
Undiff to Intuiton	Professional Focus	50.16	***
Diff to Sensing	Adaptation to Teaching	165.14	***
	Professional Focus	137.36	***
	Influence Other Students	128.87	***
Diff to Intuition	Adaptation to Teaching	89.16	***
	Influence Other Students	81.95	***

12 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	22.36	$p < .05$	*
	27.69	$p < .01$	**
	34.53	$p < .001$	***

Change Learning Strategy (Thinking, Feeling) Within Each

Significant Responses **Thinking**, Why Change Learning Strategy (Top 3 Reasons)				
Category	Response	Frequency	Chi Sq Statistic	Significance
All	Adaptation to Teaching	300	560.89	***
(N=1086)	Professional Focus	262	381.24	***
	Influence Other Students	246	315.95	***
Differentiated	Adaptation to Teaching	256	475.63	***
(N=930)	Professional Focus	223	320.68	***
	Influence Other Students	214	283.70	***
Significant Responses **Feeling**, Why Change Learning Strategy (Top 3 Reasons)				
Category	Response	Frequency	Chi Sq Statistic	Significance
All	Adaptation to Teaching	54	88.67	***
(N=210)	Influence Other Students	53	84.04	***
	Professional Focus	46	55.14	***
Differentiated	Adaptation to Teaching	33	49.25	***
(N=135)	Infludence Other Students	31	40.93	***
	Professional Focus	28	29.88	***

Significant Responses **Total Undifferentiated (Ts and Fs)** Why Change Learning Strategy (Top 3 Reasons)				
Category	Response	Frequency	Chi Sq Statistic	Significance
Ts and Fs	Adaptation to Teaching	65	125.54	***
(N=231)	Professional Focus	57	73.87	***
	Influence Other Students	54	86.61	***

Change Learning Strategy (Thinking, Feeling), Between Each

Significant Responses Between **All Thinking and Feeling**			
Category	Response	Chi Sq Statistic	Level of Significance
Thinking	Adaptation to Teaching	278.18	***
	Influence Other Students	273.19	***
	Professional Focus	236.78	***
Feeling	----	----	----
Significant Responses Between **Differentiated Thinking and Feeling**			
Category	Response	Chi Sq Statistic	Level of Significance
Thinking	Adaptation to Teaching	231.79	***
	Influence Other Students	217.79	***
	Professional Focus	196.47	***
Feeling	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Thinking & Feeling**			
Category	Response	Chi Sq Statistic	Level of Significance
Undiff to Feeling	Adaptation to Teaching	30.82	**
	Professional Focus	32.77	**
	Influence Other Students	25.21	*
Diff to Thinking	Adaptation to Teaching	263.60	***
	Professional Focus	221.12	***
	Influence Other Students	227.58	***

12 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	22.36	$p < .05$	*
	27.69	$p < .01$	**
	34.53	$p < .001$	***

Change Learning Strategy (Judging, Perceiving), Within Each

Significant Responses **Judging**, Why Change Learning Strategy (Top 3 Reasons)

Category	Response	Frequency	Chi Sq Statistic	Significance
All	Adaptation to Teaching	228	405.29	***
(N=849)	Professional Focus	204	294.54	***
	Influence Other Students	189	234.27	***
Differentiated	Adaptation to Teaching	167	308.18	***
(N=609)	Professional Focus	149	222.76	***
	Influence Other Students	135	165.89	***

Significant Responses **Perceiving**, Why Change Learning Strategy (Top 3 Reasons)

Category	Response	Frequency	Chi Sq Statistic	Significance
All	Adaptation to Teaching	126	244.10	***
(N=447)	Influence Other Students	110	166.29	***
	Professional Focus	104	140.94	***
Differentiated	Adaptation to Teaching	82	164.63	***
(N=285)	Professional Focus	70	105.43	***
	Influence Other Students	68	96.84	***

Significant Responses **Total Undifferentiated (Js and Ps)**,
Why Change Learning Strategy (Top 3 Reasons)

Category	Response	Frequency	Chi Sq Statistic	Significance
Js and Ps	Adaptation to Teaching	105	177.45	***
(N=402)	Professional Focus	96	136.95	***
	Influence Other Students	89	109.07	***

Change Learning Strategy (Judging, Perceiving), Between Each

Significant Responses Between **All Judging and Perceiving**

Category	Response	Chi Sq Statistic	Level of Significance
Judging	Adaptation to Teaching	118.99	***
	Professional Focus	106.44	***
	Influence Other Students	98.40	***
Perceiving	----	----	----

Significant Responses Between **Differentiated Judging and Perceiving**

Category	Response	Chi Sq Statistic	Level of Significance
Judging	Adaptation to Teaching	88.64	***
	Professional Focus	79.03	***
	Influence Other Students	71.46	***
Perceiving	----	----	----

Significant Responses Between **Total Undifferentiated and Differentiated Judging & Perceiving**

Category	Response	Chi Sq Statistic	Level of Significance
Undiff to Perceiving	Adaptation to Teaching	77.54	***
	Professional Focus	58.12	***
	Influence Other Students	66.55	***
Diff to Judging	Adaptation to Teaching	172.76	***
	Professional Focus	123.04	***
	Influence Other Students	162.15	***

12 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	22.36	$p < .05$	*
	27.69	$p < .01$	**
	34.53	$p < .001$	***

G.1.g

Quarter Adjusted to Program (Extraverts, Introverts), Within Each

Significant Quarters **Extraverts**, Quarter Adjusted

Category	Quarter	Frequency	Chi Sq Statistic	Level of Significance
All	2nd Quarter	99	176.63	***
(N=283)	1st Quarter	64	45.03	***
Differentiated	2nd Quarter	87	165.38	***
(N=240)	1st Quarter	52	32.67	***

Significant Quarters **Introverts**, Quarter Adjusted

Category	Quarter	Frequency	Chi Sq Statistic	Level of Significance
All	1st Quarter	104	95.72	***
(N=412)	2nd Quarter	99	81.09	***
	3rd Quarter	80	36.54	***
Differentiated	2nd Quarter	67	64.09	***
(N=261)	3rd Quarter	61	46.67	***
	1st Quarter	58	38.99	***

Significant Quarters **Total Undifferentiated (Es and Is)**, Quarter Adjusted

Category	Quarter	Frequency	Chi Sq Statistic	Level of Significance
Es and Is	1st Quarter	58	76.80	***
(N=194)	2nd Quarter	44	31.19	***

Quarter Adjusted to Program (Extraverts, Introverts), Between Each

Significant Quarters Between **All Extraverts and Introverts**

Category	Quarter	Chi Sq Statistic	Level of Significance
Extravert	2nd Quarter	143.44	***
Introvert	1st Quarter	92.06.	***
	3rd Quarter	71.69	***

Significant Quarters Between **Differentiated Extraverts and Introverts**

Category	Quarter	Chi Sq Statistic	Level of Significance
Extravert	2nd Quarter	93.90	***
Introvert	1st Quarter	55.52	***
	3rd Quarter	44.34	***

Significant Quarters Between **Total Undifferentiated** and **Differentiated Extraverts & Introverts**

Category	Quarter	Chi Sq Statistic	Level of Significance
Significant Undifferentiated Quarters			
Undiff to Extravert	1st Quarter	36.45	***
Undiff to Introvert	1st Quarter	41.77	***
Significant Differentiated Quarters			
Diff to Extravert	2nd Quarter	137.81	***
	3rd Quarter	51.57	***
Diff to Introvert	3rd Quarter	101.09	***
	2nd Quarter	74.49	***

9 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	16.919	$p < .05$	*
	21.666	$p < .01$	**
	27.877	$p < .001$	***

Quarter Adjusted to Program (Sensing, Intuition), Within Each

Significant Quarters **Sensing**, Quarter Adjusted

Category	Quarter	Frequency	Chi Sq Statistic	Level of Significance
All	2nd Quarter	133	189.23	***
(N=429)	1st Quarter	103	84.20	***
	3rd Quarter	75	24.02	**
Differentiated	2nd Quarter	107	144.01	***
(N=355)	1st Quarter	88	77.64	***
	3rd Quarter	63	21.30	*

Significant Quarters **Intuition**, Quarter Adjusted

Category	Quarter	Frequency	Chi Sq Statistic	Level of Significance
All	1st Quarter	65	55.43	***
(N=266)	2nd Quarter	65	55.43	***
	3rd Quarter	55	30.32	***
Differentiated	1st Quarter	55	63.25	***
(N=197)	2nd Quarter	42	25.24	***
	3rd Quarter	39	18.91	*

Significant Quarters **Total Undifferentiated (Ss and Ns)**, Quarter Adjusted

Category	Quarter	Frequency	Chi Sq Statistic	Level of Significance
Ss and Ns (N=143)	2nd Quarter	49	84.02	***

Quarter Adjusted to Program (Sensing, Intuition), Between Each

Significant Quarters Between **All Sensing and Intuition**

Category	Quarter	Chi Sq Statistic	Level of Significance
Sensing	1st Quarter	103.85	***
	2nd Quarter	103.56	***
Intuition	3rd Quarter	87.86	***

Significant Quarters Between **Differentiated Sensing and Intuition**

Category	Quarter	Chi Sq Statistic	Level of Significance
Sensing	1st Quarter	98.22	***
	2nd Quarter	74.27	***
	3rd Quarter	69.38	***
Intuition	----	----	----

Significant Quarters Between **Total Undifferentiated and Differentiated Sensing & Intuition**

Significant Undifferentiated Quarters

Category	Quarter	Chi Sq Statistic	Level of Significance
Undiff to Intuition	2nd Quarter	24.75	**
Significant Differentiated Quarter			
Diff to Sensing	1st Quarter	122.29	***
	2nd Quarter	91.64	***
	3rd Quarter	54.62	***
Diff to Intuition	1st Quarter	86.45	***
	3rd Quarter	38.05	***

9 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	16.919	$p < .05$	*
	21.666	$p < .01$	**
	27.877	$p < .001$	***

Quarter Adjusted to Program (Thinking, Feeling), Within Each

Significant Quarters Thinking, Quarter Adjusted

Category	Quarter	Frequency	Chi Sq Statistic	Level of Significance
All	2nd Quarter	168	210.10	***
(N=578)	1st Quarter	145	131.55	***
	3rd Quarter	104	36.93	***
Differentiated	2nd Quarter	146	188.90	***
(N=494)	1st Quarter	123	109.66	***
	3rd Quarter	88	30.16	***

Significant Quarters Feeling, Quarter Adjusted

Category	Quarter	Frequency	Chi Sq Statistic	Level of Significance
All	2nd Quarter	30	28.62	***
(N=117)	3rd Quarter	26	17.48	*
Differentiated (N=70)	----	----	----	----
Undifferentiated (N=47)	2nd Quarter	14	32.19	***

Significant Quarters Total Undifferentiated (Ts and Fs), Quarter Adjusted

Category	Quarter	Frequency	Chi Sq Statistic	Level of Significance
Ts and Fs	2nd Quarter	39	51.21	***
(N=131)	1st Quarter	29	19.30	**

Quarter Adjusted to Program (Thinking, Feeling) Between Each

Significant Quarters Between All Thinking and Feeling

Category	Quarter	Chi Sq Statistic	Level of Significance
Thinking	2nd Quarter	147.07	***
	3rd Quarter	127.64	***
	1st Quarter	112.35	***
Feeling	----	----	----

Significant Quarters Between Differentiated Thinking and Feeling

Category	Quarter	Chi Sq Statistic	Level of Significance
Thinking	2nd Quarter	112.13	***
	1st Quarter	90.15	***
	3rd Quarter	56.03	***
Feeling	----	----	----

Significant Quarters Between Total Undifferentiated and Differentiated Thinking & Feeling

Significant Differentiated Quarters

Category	Quarter	Chi Sq Statistic	Level of Significance
Diff to Thinking	1st Quarter	134.57	***
	2nd Quarter	141.17	***
	3rd Quarter	75.21	***

9 Degrees of Freedom

Test Stat	Level of Significance	Symbol
16.919	$p < .05$	*
21.666	$p < .01$	**
27.877	$p < .001$	***

Quarter Adjusted to Program (Judging, Perceiving) Within Each

Significant Quarters **Judging**, Quarter Adjusted				
Category	Quarter	Frequency	Chi Sq Statistic	Level of Significance
All	2nd Quarter	133	176.01	***
(N=445)	1st Quarter	105	82.25	***
	3rd Quarter	92	50.70	***
Differentiated	2nd Quarter	93	118.54	***
(N=317)	1st Quarter	77	64.73	***
	3rd Quarter	68	41.57	***

Significant Quarters **Perceiving**, Quarter Adjusted				
Category	Quarter	Frequency	Chi Sq Statistic	Level of Significance
All	2nd Quarter	65	64.00	***
(N=250)	1st Quarter	63	57.76	***
Differentiated	1st Quarter	42	36.76	***
(N=170)	2nd Quarter	42	36.76	***

Significant Quarters **Total Undifferentiated (Js and Ps)**, Quarter Adjusted				
Category	Quarter	Frequency	Chi Sq Statistic	Level of Significance
Js and Ps	1st Quarter	63	38.23	***
(N=208)	2nd Quarter	49	85.62	***
	3rd Quarter	41	19.62	*

Quarter Adjusted to Program (Judging, Perceiving) Between Each

Significant Quarters Between **All Judging and Perceiving**			
Category	Quarter	Chi Sq Statistic	Level of Significance
Judging	2nd Quarter	73.85	***
	1st Quarter	57.92	***
	3rd Quarter	50.95	***
Perceiving	----	----	----

Significant Quarters Between **Differentiated Judging and Perceiving**			
Category	Quarter	Chi Sq Statistic	Level of Significance
Judging	2nd Quarter	49.03	***
	1st Quarter	40.27	***
	3rd Quarter	35.89	***
Perceiving	----	----	----

Significant Quarters Between **Total Undifferentiated and Differentiated Judging & Perceiving**			
Significant Undifferentiated Quarters			
Category	Quarter	Chi Sq Statistic	Level of Significance
Undiff to Perceiving	1st Quarter	43.23	***
	2nd Quarter	33.44	***
Significant Differentiated Quarters			
Diff to Judging	1st Quarter	77.87	***
	2nd Quarter	88.56	***
	3rd Quarter	72.48	***

9 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	16.919	$p < .05$	*
	21.666	$p < .01$	**
	27.877	$p < .001$	***

G.2.a.
Grade Point Average (Intuition-Feeling & Sensing-Thinking)

Significant Responses all Intuition-Feeling

N=65

Range	Frequency	Chi Sq Statistic	Level of Significance
About Right	25	11.07	*

Significant Responses Differentiated Intuition-Feeling

N=31

Range	Frequency	Chi Sq Statistic	Level of Significance
----	----	----	----

Significant Responses all Sensing-Thinking

N=377

Range	Frequency	Chi Sq Statistic	Level of Significance
About Right	192	180.31	***
Lower Than Should Be	119	25.21	***

Significant Responses Differentiated Sensing-Thinking

N=295

Range	Frequency	Chi Sq Statistic	Level of Significance
About Right	148	134.25	***
Lower Than Should Be	92	18.46	**

Grade Point Average Between all Intuition-Feeling and Sensing-Thinking

Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)

Range	Chi Sq Statistic	Level of Significance
----	----	----

Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)

Range	Chi Sq Statistic	Level of Significance
About Right	143.68	***
Lower Than Should Be	114.97	***

Significant Responses between **Differentiated Intuition-Feeling and Sensing-Thinking**

Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)

Range	Chi Sq Statistic	Level of Significance
----	----	----

Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)

Range	Chi Sq Statistic	Level of Significance
About Right	93.61	***
Lower Than Should Be	74.92	***

4 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

Grade Point Average (Intuition-Thinking & Sensing-Feeling)

Significant Responses all Intuition-Thinking

N=201

Range	Frequency	Chi Sq Statistic	Level of Significance
About Right	103	98.11	***

Significant Responses Differentiated **Intuition-Thinking**, Grade Point

N=107

Range	Frequency	Chi Sq Statistic	Level of Significance
About Right	53	46.66	***

Significant Responses all Sensing-Feeling

N=52

Range	Frequency	Chi Sq Statistic	Level of Significance
About Right	32	44.86	***

Significant Responses Differentiated **Sensing-Feeling**

N=26

Range	Frequency	Chi Sq Statistic	Level of Significance
About Right	16	22.43	***

Grade Point Average Between all Intuition-Thinking and Sensing-Feeling

Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)

Range	Chi Sq Statistic	Level of Significance
About Right	25.44	***

Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)

----	----	----

Grade Point Average Between Differentiated Intuition-Thinking & Sensing-Feeling

Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)

Range	Chi Sq Statistic	Level of Significance
About Right	11.64	*

Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)

----	----	----

4 Degrees of Freedom

Test Stat	Level of Significance	Symbol
9.488	$p < .05$	*
13.28	$p < .01$	**
18.47	$p < .001$	***

G.2.b.

Consider Dropping Program (Intuition-Feeling & Sensing-Thinking)

Significant Responses all **Intuition-Feeling** (N=65)

Response	Frequency	Chi Sq Statistic	Level of Significance
No	55	51.28	***

Significant Responses Differentiated **Intuition-Feeling** (N=31)

Response	Frequency	Chi Sq Statistic	Level of Significance
No	25	20.82	***

Significant Responses all **Sensing-Thinking** (N=377)

Response	Frequency	Chi Sq Statistic	Level of Significance
No	342	372.41	***

Significant Responses Differentiated **Sensing-Thinking** (N=295)

Response	Frequency	Chi Sq Statistic	Level of Significance
No	267	289.31	***

Consider Dropping Program (Intuition-Thinking & Sensing-Feeling)

Significant Responses all **Intuition-Thinking** (N=201)

Response	Frequency	Chi Sq Statistic	Level of Significance
No	186	211.36	***

Significant Responses Differentiated **Intuition-Thinking** (N=107)

Response	Frequency	Chi Sq Statistic	Level of Significance
No	98	108.94	***

Significant Responses all **Sensing-Feeling** (N=52)

Response	Frequency	Chi Sq Statistic	Level of Significance
No	46	47.41	***

Significant Responses Differentiated **Sensing-Feeling** (N=26)

Response	Frequency	Chi Sq Statistic	Level of Significance
No	24	27.13	***

2 Degrees of Freedom

Test Stat	Level of Significance	Symbol
5.991	$p < .05$	*
9.21	$p < .01$	**
13.82	$p < .001$	***

G.2.c.

Why Drop (If yes to Drop)

Significant Responses all **Sensing-Thinking**, (N=35)

Response	Frequency	Chi Sq Statistic	Level of Significance
Other	13	12.8	*

6 Degrees of Freedom

Test Stat	Level of Significance	Symbol
12.59	$p < .05$	*
16.81	$p < .01$	**
22.46	$p < .001$	***

G.2.d.

Number Courses Dropped/Added (Intuition-Feeling & Sensing-Thinking)

Number	Frequency	Chi Sq Statistic	Level of Significance
	Significant Responses all **Intuition-Feeling** (N=65)		
0	29	102.68	***
2	23	57.07	***
	Significant Responses all **Sensing-Thinking** (N=377)		
0	174	647.11	***
2	117	233.14	***
	Significant Responses Differentiated **Sensing-Thinking** (N=295)		
0	143	570.41	***
2	93	190.41	***

Number Courses Dropped/Added Between all Intuition-Feeling & Sensing-Thinking

Number	Chi Sq Statistic	Level of Significance
	Intuition-Feeling Responses (as compared to Sensing-Thinking)	
---	---	---
	Sensing-Thinking Responses (as compared to Intuition-Feeling)	
0	167.17	***
2	132.52	***

Number Courses Dropped/Added (Intuition-Thinking & Sensing-Feeling)

Number	Frequency	Chi Sq Statistic	Level of Significance
	Significant Responses all **Intuition-Thinking** (N=201)		
0	105	464.96	***
2	44	44.33	***
	Significant Responses Differentiated **Intuition-Thinking** (N=107)		
0	57	259.29	***
	Significant Responses all **Sensing-Feeling** (N=52)		
0	23	259.29	***
	Significant Responses Differentiated **Sensing-Feeling** (N=26)		
0	11	80.14	***

Number Courses Dropped/Added Between all Intuition-Thinking & Sensing-Feeling

Number	Chi Sq Statistic	Level of Significance
	Intuition-Thinking Responses (as compared to Sensing-Feeling)	
0	26.32	**
	Sensing-Feeling Responses (as compared to Intuition-Thinking)	
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Number Course Drop/Add Between Differentiate Intuition-Thinking & Sensing-Feeling

Number	Chi Sq Statistic	Level of Significance
	Intuition-Thinking Responses (as compared to Sensing-Feeling)	
----	----	----
	Sensing-Feeling Responses (as compared to Intuition-Thinking)	
----	----	----

11 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	19.68	p < .05	*
	24.73	p < .01	**
	31.26	p <.001	***

G.2.e.
Changed Learning Strategy (Intuition-Feeling & Sensing-Thinking)

Significant Responses all **Intuition-Feeling**

N=65

Response	Frequency	Chi Sq Statistic	Level of Significance
----	----	----	----

Significant Responses Differentiated **Intuition-Feeling**

N=31

----	----	----	----

Significant Responses all **Sensing-Thinking**

N=377

Response	Frequency	Chi Sq Statistic	Level of Significance
Perhaps	120	52.01	***
Yes, somewhat	103	25.68	***

Significant Responses Differentiated **Sensing-Thinking**

N=295

Perhaps	103	58.94	***

Changed Learning Strategy Between all Intuition-Feeling & Sensing-Thinking

Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)

Response	Chi Sq Statistic	Level of Significance
----	----	----

Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)

Perhaps	97.38	***
Yes, somewhat	85.82	***

Changed Learning Strategy
Between Differentiated Intuition-Feeling & Sensing-Thinking

Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)

Response	Chi Sq Statistic	Level of Significance
----	----	----

Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)

Yes, somewhat	75.21	***
Perhaps	74.77	***

5 Degrees of Freedom

Test Stat	Level of Significance	Symbol
11.07	$p < .05$	*
15.09	$p < .01$	**
20.51	$p < .001$	***

Changed Learning Strategy (Intuition-Thinking & Sensing-Feeling)

Significant Responses all **Intuition-Thinking**

N=201

Response	Frequency	Chi Sq Statistic	Level of Significance
Perhaps	71	41.98	***
Yes, somewhat	53	11.35	*

Significant Responses Differentiated **Intuition-Thinking**

N=107

Perhaps	38	22.81	***

Significant Responses all **Sensing-Feeling**

N=52

Response	Frequency	Chi Sq Statistic	Level of Significance
----	----	----	----

Significant Responses Differentiated **Sensing-Feeling**

N=26

----	----	----	----

Changed Learning Strategy Between all Intuition-Thinking and Sensing-Feeling

Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)

Response	Chi Sq Statistic	Level of Significance
Perhaps	17.49	**
Yes, somewhat	12.69	*

Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)

----	----	----

Changed Learning Strategy Between Differentiated Intuition-Thinking and Sensing-Feeling

Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)

Response	Chi Sq Statistic	Level of Significance
----	----	----

Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)

Response	Chi Sq Statistic	Level of Significance
----	----	----

5 Degrees of Freedom

Test Stat	Level of Significance	Symbol
11.07	$p < .05$	*
15.09	$p < .01$	**
20.51	$p < .001$	***

G.2.f.

Top 3 Reasons Why Changed Learning (Intuition-Feeling & Sensing-Thinking)

Response	Frequency	Chi Sq Statistic	Level of Significance
Significant Responses all Intuition-Feeling (N=114)			
Adaptation to Teaching	30	51.40	***
Professional Focus	27	37.90	***
Influence Other Students	27	37.90	***
Significant Responses Differentiated Intuition-Feeling (N=60)			
Adaptation to Teaching	15	23.37	*
Professional Focus	13	15.23	----
Influence Other Students	11	8.83	----

Response	Frequency	Chi Sq Statistic	Level of Significance
Significant Responses all Sensing-Thinking (N=702)			
Adaptation to Teaching	194	362.96	***
Influence Other Students	165	228.17	***
Professional Focus	165	228.17	***
Significant Responses Differentiated Sensing-Thinking (N=540)			
Adaptation to Teaching	151	288.45	***
Influence Other Students	127	175.83	***
Professional Focus	124	163.70	***

Top 3 Reasons Why Changed Learning Between all Intuition-Feeling & Sensing-Thinking

Response	Chi Sq Statistic	Level of Significance
Intuition-Feeling Responses (as compared to Sensing-Thinking)		
---	---	---
Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Adaptation to Teaching	183.69	***
Professional Focus	165.27	***
Influence Other Students	165.27	***

Top 3 Reasons Why Changed Learning Between Differentiated Intuition-Feeling and Sensing-Thinking

Response	Chi Sq Statistic	Level of Significance
Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)		
---	---	---
Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)		
Adaptation to Teaching	141.68	***
Professional Focus	122.71	***
Influence Other Students	103.46	***

12 Degrees of Freedom	Test Stat	Level of Significance	Symbol
	22.36	$p < .05$	*
	27.69	$p < .01$	**
	34.53	$p < .001$	***

Top 3 Reasons Why Changed Learning (Intuition-Thinking & Sensing-Feeling)

All **Intuition-Thinking** (N=384)			
Response	Frequency	Chi Sq Statistic	Level of Significance
Adaptation to Teaching	106	197.92	***
Professional Focus	97	154.07	***
Influence Other Students	81	89.66	***
Differentiated **Intuition-Thinking** (N=192)			
Adaptation to Teaching	52	93.85	***
Professional Focus	48	74.77	***
Influence Other Students	39	39.75	***

Significant Responses all **Sensing-Feeling**, (N=96)			
Response	Frequency	Chi Sq Statistic	Level of Significance
Influence Other Students	26	46.93	***
Adaptation to Teaching	24	37.38	***
Professional Focus	19	----	----

Top 3 Reasons Why Changed Learning Between all Intuition-Thinking and Sensing-Feeling

Intuition-Thinking Responses (as compared to Sensing-Feeling)		
Response	Chi Sq Statistic	Level of Significance
Adaptation to Teaching	25.59	*
Professional Focus	23.47	*
Influence Other Students	----	----
Sensing-Feeling Responses (as compared to Intuition-Thinking)		
---	---	---

12 Degrees of Freedom

Test Stat	Level of Significance	Symbol
22.36	p < .05	*
27.69	p < .01	**
34.53	p <.001	***

G.2.g.

Quarter Adjusted (Intuition-Feeling & Sensing-Thinking)

Significant Responses all **Intuition-Feeling** (N=65)

Quarter	Frequency	Chi Sq Statistic	Level of Significance
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Significant Responses all **Sensing-Thinking** (N=377)

Quarter	Frequency	Chi Sq Statistic	Level of Significance
2nd Quarter	114	154.42	***
1st Quarter	94	84.08	***

Significant Responses Differentiated **Sensing-Thinking** (N=295)

Quarter	Frequency	Chi Sq Statistic	Level of Significance
2nd Quarter	85	104.42	***
1st Quarter	75	70.18	***

Quarter Adjusted Between all Intuition-Feeling and Sensing-Thinking

Significant Intuition-Feeling Responses (as compared to Sensing-Thinking)

Quarter	Chi Sq Statistic	Level of Significance
----	----	----

Significant Sensing-Thinking Responses (as compared to Intuition-Feeling)

Quarter	Chi Sq Statistic	Level of Significance
2nd Quarter	74.58	***
1st Quarter	62.01	***

Quarter Adjusted (Intuition-Feeling & Sensing-Thinking)

Significant Responses all **Intuition-Thinking** (N=201)

Quarter	Frequency	Chi Sq Statistic	Level of Significance
2nd Quarter	54	57.17	***
1st Quarter	51	47.50	***
3rd Quarter	42	23.86	**

Significant Responses Differentiated **Intuition-Thinking** (N=107)

Quarter	Frequency	Chi Sq Statistic	Level of Significance
1st Quarter	29	31.30	***
2nd Quarter	26	21.88	**

Significant Responses all **Sensing-Feeling** (N=52)

Quarter	Frequency	Chi Sq Statistic	Level of Significance
2nd Quarter	19	36.62	***

Quarter Adjusted Between all Intuition-Thinking and Sensing-Feeling

Significant Intuition-Thinking Responses (as compared to Sensing-Feeling)

Quarter	Chi Sq Statistic	Level of Significance
----	----	----

Significant Sensing-Feeling Responses (as compared to Intuition-Thinking)

Quarter	Chi Sq Statistic	Level of Significance
----	----	----

9 Degrees of Freedom

Test Stat	Level of Significance	Symbol
16.919	$p < .05$	*
21.666	$p < .01$	**
27.877	$p < .001$	***

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Vita

Jeannine A. Duncan (nee Garrett) was born 29 January 1960 in Akron, Ohio. She graduated from Beavercreek High School in Beavercreek, Ohio in 1978. She continued her education by attending Wright State University in Dayton, Ohio for two quarters before transferring to Purdue University in West Lafayette, Indiana. While at Purdue University, she majored in Retail Management and earned her Bachelor of Science degree. With the completion of her degree, she become a third-generation alumna as her father and grandfather had both earned their undergraduate degrees at Purdue University. She began her work with the Air Force in 1984 when she was hired to work with the Logistics Operations Center (LOC) at Wright-Patterson AFB, Ohio. Her initial position was through an accelerated training program known as the Schedule B, which involved rotation throughout the various divisions of the Common Forces directorate within the LOC. In 1987 she was transferred to Headquarters Air Force Logistics Command where she was assigned to the Deputy Chief of Staff for Materiel Management, Directorate of Engineering and Technical Information, HQ AFLC/MME. During the time from 1987-1992 she was the assistant logistics/budget analysis for the Sustaining Engineering program. After the reorganization of HQ AFLC in 1992, she was assigned to the Deputy Chief of Staff for Engineering as the financial/resource advisor. She is married to Vincent L. Duncan and has one child, Marsalene Elise.

Permanent Address: 1658 Turnbull Road
Beavercreek, Ohio 45432-2342

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13. ABSTRACT (Maximum 200 words)

This research addresses significant relationships between the components of an individual's psychological type and cognitive style, as measured by the Myers-Briggs Type Indicator (MBTI), and preferences within the academic environment, as indicated on the Educational Style Survey (ESS). The areas within the academic environment which were addressed include classroom configuration, subject matter difficulty, student's study strategy, testing method preferences, amount of student/faculty interaction, and adaptability to academic stress. The sample consisted of 695 Air Force Institute of Technology (AFIT) graduate students in the School of Logistics and Acquisition Management (1985-93) who completed the MBTI and the ESS. The analysis utilized in this research was the Chi-Squared Goodness of Fit procedures, which determined that some preferences within the academic environment are most or least preferred by the eight MBTI single letter psychological types and the four cognitive types. The eight single letter types are composed of four bipolar types which are Extraversion/Introversion, Sensing/iNtuition, Thinking/Feeling, and Judging/Perceiving, and the four cognitive types are Sensing-Thinking (ST), Sensing-Feeling (SF), Intuitive-Thinking (NT), and Intuitive-Feeling (NF). Recommendations for additional research are provided.

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Vita

Pamela J. Powers was born 24 May 1962 in Springfield, Ohio. She graduated from Northwestern High School as Valedictorian in 1980 and from Miami University, Oxford, Ohio in 1984. While at Miami University she majored in Accounting and received a Bachelor of Science in Business.

Pam began her civil service career with the Air Force in September 1984 at Wright-Patterson Air Force Base. Her first job was with the Common Forces Division of the Logistics Operations Center, Air Force Logistics Command. In 1987 she became a systems control officer for various Communications-Electronics and Space systems in the Strategic Forces Division of the Logistics Operations Center. From there she moved to the Directorate of Plans at Air Force Material (Logistics) Command. Throughout her career, Pam has received the Arthur Sarris Award for Planners in 1992, was recognized as one of the outstanding civil servants in the Dayton Area in 1993, and has received various sustained superior performance awards. While at the Air Force Institute of Technology (AFIT), she became a member of Sigma Iota Epsilon, a Management honorary. After her graduation from AFIT, Pam will return to the Directorate of Plans, Air Force Material Command.

Permanent Address: 340 Marshall Drive
Xenia, Ohio 45385