Personality Types of Student Pilots Admitted to the Aviation Flight Program at Southern Illinois University Carbondale

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ABSTRACT

The purpose of this study was to determine if there is a statistically significant common personality type or common combinations of type within the personality profiles among 83 students who enrolled in the Aviation Flight Department at Southern Illinois University at Carbondale (SIUC). The Myers-Briggs Personality Inventory (MBTI) was the instrument used to determine student's personality types. Basic information including age, sex, high school grade point average and ACT scores were also collected. Data collected were analyzed using a chi-square (χ^2) distribution to determine whether there was a statistical significant difference between the MBTI types of the Aviation Flight student population and the general population. The study revealed several personality types and personality type combinations among the students to have a statistical departure from the general population implying that there are personality types or combinations of type of students interested in becoming a professional pilot.

INTRODUCTION

Aviation psychologists have been interested in studying personality characteristics of pilots for years. A pilot's personality characteristics are usually described as having good social skills and reasoning. Also, pilots need to deal with complex information, make quick decisions and often are required to interact with people (Rose, 2001). Pilots are also generally seen as a consistent and stable group. Pilots like their information to be brief and concise and like to be presented with the big picture or overview (Rose, 2001). Flying an airplane is goal directed. It is the pilot's job to select the various sub goals that will lead to the accomplishment of the ultimate goal. Pilots' activities can be thought of as procedural, decisional and perceptual motor (Roscoe, 1980). The manner in which a pilot perceives information and makes judgments is important for the safety and successful completion of a flight.

This study will use the Myers-Briggs Personality Inventory (MBTI) to determine if there is a statistically significant common personality type or common combinations of type within the personality profiles among 83 students who enrolled in the Aviation Flight Department at Southern Illinois University at Carbondale (SIUC).

BACKGROUND

The Myers-Briggs Type Indicator (MBTI) (Myers & McCaulley, 1985) is a personality measure that was developed by Isabel Briggs Myers and her mother, Katherine Cook Briggs. The MBTI was based on Jung's (1921) theory of psychological type. During the past 30 years, there has been an increase in the use of the inventory in both personal and professional settings.

In 1920, a new theory concerning psychological type surfaced from a Swiss psychiatrist named Carl G. Jung. In 1921, Jung theorized that what appears to be random variation in human behavior actually is orderly, logical, and consistent and is the result of basic differences in mental functioning and attitude (Wicklein & Rojewski, 1995). He wrote, "what appears to be random behavior is actually the result of differences in the way people prefer to use their mental capacities" (The Myers & Briggs Foundation, 2005, C.G. Jung's Theory, ¶ 1). The essence of Jung's personality theory was based on four mental processes or functions. These functions include sensing, intuition, thinking and feeling. Each of these functions involves an individual's orientation towards themselves and their environment through perception and judgment (Myers & McCaulley, 1985). Perception includes the process of becoming aware of things, people, ideas, and occurrences. Judgment includes the process of

coming to a conclusion about what has been perceived. Perception and judgment make up a large portion of our mental activity. Perception determines what we see in a situation, and judgment determines what we will decide to do with what we have perceived (Myers, 1980). Jung also observed that every person was energized by the external world which was referred to as extraversion or receiving energy from the internal world which was referred to as introversion. Jung's book, *Psychological Types*, was not well received by the public. His perspective was one of a practicing psychologist who treated patients with severe psychological problems and his focus was the unsuccessful development of type that he found in his patients. The book was not popular due to the specialized German audience and the academic language that it contained (The Myers & Briggs Foundation, 2005).

In *Psychology Types* (1921), Jung suggested that individuals can arrange mental habits between opposite poles of three personality dimensions. The first of these pertains to the direction of a person's energy. Jung used the terms introversion and extroversion. The second, which refers to one's cognitive or mental function, pertains to how the person perceives information and what type of information is attractive to the person (Pearman & Albritton, 1997). These are referred to as sensing and intuition. Jung's third dimension, which is also a mental or cognitive function, pertains to one's judgments or decision making about the information that has been received. These were referred to as thinking and feeling. Isabel Briggs Myers and Katherine Briggs added a fourth dimension to Jung's model: the fourth dimension pertains to a person's orientation to the world. Myers and Briggs used the terms judgment and perception. Each was named after the mental functions associated with the orientation (Pearman & Albritton, 1997). Thinking and feeling was associated with the judgment orientation. Sensing and intuition was associated with the perception orientation. These four dimensions, Extraversion (E) and Introversion (I), Sensing (S) and Intuition (N), Thinking (T) and Feeling (F), and Judging (J) and Perceiving (P) make up the psychological typology within the MBTI (Pearman & Albritton, 1997).

The first dimension, extraversion or introversion, pertains to whether a person focuses on and is energized by the inner world or the outer world. The individual that prefers extraversion is energized by the outer world (The Myers & Briggs Foundation, 2005). The extravert seeks engagement with the environment or an event to be experienced and likes to move into action and make things happen. An extravert will often talk aloud even when alone so they can experience an external event (Lawrence, 1996). On the other hand, an introvert prefers to focus and be energized by their inner world. Typically an introvert focuses on ideas and concepts and tends to be more reflective. The introvert will deeply consider before acting and will also prefer to be alone. There are some misconceptions concerning the term introvert. Introversion does not necessarily mean shy or always wanting to be alone (The Myers & Briggs Foundation, 2005).

The second dimension, sensing or intuitive, pertains to how an individual takes in or perceives information. The individual that prefers sensing will pay more attention to the information they can obtain through their five senses. The sensing person will pay more attention to the practical and to detail and will rely on past experience rather than trust words. The sensing person will attend to the present moment rather than look toward future possibilities and is seen as methodical and certain. The individual that prefers intuition over sensing will pay more attention to patterns and possibilities (Lawrence, 1996). One who is intuitive will see the big picture instead of focusing on the details and will rely more on ideas than past experiences. They are often seen as creative and imaginative (The Myers & Briggs Foundation, 2005).

The third dimension, thinking or feeling, pertains to how an individual makes decisions or judges the information that he/she has absorbed. The individual that prefers thinking will use more logic and put more weight on objective and impersonal facts when making a decision. One who prefers thinking over feeling will tend to be more truthful than tactful (The Myers & Briggs Foundation, 2005). The thinking

preference will also put more attention to ideas or things than human relationships. Because of this, they can also be seen as uncaring or indifferent. One who prefers thinking also wants to be treated justly and fairly (Lawrence, 1996). The individual that prefers the feeling preference will put more weight on personal situations and the people concerned during the decision making process. Unlike the person with the thinking preference, the individual that prefers feeling will value harmony within groups more as well as be more aware of people's feelings. The feeling preference also likes praise and feels the need to please people even in smaller matters and will try to be more tactful than telling the hard truth (The Myers & Briggs Foundation, 2005).

The fourth dimension, judgment or perception, pertains to an individual's use of their judging mental process (T or F) or perceiving mental process (S or N) in the outer world (McCaulley & Martin, 1995). The individual that uses judging as his or her preference tends to have a more structured and decided lifestyle. Those individuals who have a judging preference like to plan ahead and keep to a schedule. Generally this person will only like to have one project going at one time and finish it before they start another. The individual that uses perception tends to prefer a more flexible lifestyle. Unlike judging types, perceiving types prefer to keep their options open to new developments. Perceiving types may have several things going on at one time and sometimes struggle getting everything accomplished (Lawrence, 1996).

The MBTI generates preference scores that describe a person's personality interaction with the world on the four dimensions just discussed. These dimensions generate 16 possible types based on the different combinations (Pinckney, 1985). The 16 types consist of the following in table 1:

Table 1. *The 16 Personality Types of the Myers-Briggs Type Indicator*

ISTJ	ISFJ	INFJ	INTJ
ISTP	ISFP	INFP	INTP
ESTP	ESFP	ENFP	ENTP
ESTJ	ESFJ	ENFJ	ENTJ

Note. (The Myers & Briggs Foundation, 2005)

It is important to understand that individuals use both poles of each preference. For example, a person who prefers extroversion would at times function as an introvert. There is not a type that is better than another or any preference that is wrong. Jung's theory assumes that during the normal course of development, a person develops preferences that seem natural to the individual (McCaulley, 1990). After the preferences have been developed, believed to happen by the age of 7, people later in life learn to appreciate the processes that were less preferred earlier in life. While all the preferences are considered equal, they all have strengths and challenges. Understanding one's type can help an individual appreciate how everyone contributes to work situations as well as events in someone's personal life.

It is important to realize that the MBTI is more than just an instrument measuring preference type. It is a complex interrelated personality system. As mentioned previously, there are four mental functions or processes. Everyone uses both of the perceiving processes, sensing (S) and intuition (N), and both judging processes thinking (T) and feeling (F), but only prefers one of each pair over the other (Lawrence, 1996).

The four dimensions include focus of interest, information gathering, involvement with information, and the deposition of information. The description of each personality type is solely based on preference, not ability, and does not suggest that a person cannot function in ways other than one's preference (Pinckney, 1985). The possibility has been suggested that the nature of the MBTI's assessment of an individual would be not only for understanding of oneself, but relevant to career counseling (Keirsey & Bates, 1978). Because of the nature of the MBTI, it seems

well suited for the psychological assessment of career counseling.

Many people choose careers dictated by their passions. However, other people are more pragmatic and give more weight to practical concerns when choosing a career (Tieger & Barron-Tieger, 2001). Selecting a career can be difficult. Knowing your personality preference by use of the MBTI can aid in this discovery of an individual's career path (McCaulley, 1990).

There are some critics concerning the validity and reliability of the MBTI. Pittenger (1993) states:

> The patterns of data do not suggest that there is reason to believe that there are 16 unique types of personality. Furthermore, there is no convincing evidence to justify that knowledge of type is a reliable or a valid predictor of important behavioral conditions (p. 483).

Comrey (1983) and other researchers have questioned whether the MBTI did or did not adequately represent the Jungian theory on which it is based (Capraro & Capraro, 2002).

Allen L. Hammer, who is a researcher for Consulting Psychologists Press Inc. and the publisher of the MBTI, contends that the MBTI is being held to different standards from other career development instruments (Zemke, 1992). Hammer also contends:

> The underlying concept for the use of instruments in career counseling since the 1930's is matching people with a job that is congruent with their interests and preferences. The MBTI does that as well or better than any instrument on the market (Zemke, 1992, p. 46).

Personality studies for pilots date back to World War I where there was a demand for pilots as well as effective selection methods (Ganesh & Joseph, 2005). Many personality studies for pilots in the past have focused on primarily on military pilots. The objectives of many of these studies centered on the identification of personality traits that could predict successful adaptation to military aviation for the use of pilot selection (Dillinger, Wiegmann & Taneja, 2003). Patterns developed from these studies which described military pilots as outgoing, active, competitive as well as dominant and achievement oriented (Ashman & Telfer, 1983; Dillinger, Wiegmann & Taneja, 2003; Fine & Hartman, 1968). Several of these studies failed to find a relationship with personality profiles among pilots and their success in military training programs. North and Griffin (1977) reviewed research from the previous 60 years which included reviewing personality inventories. Between 1950 and 1976, forty different inventories and scales were used for pilot selection. There was no relationship found between pilot personality and selection of aviation candidates. Given this inability to find a relationship, researchers lost interest in personality inventories within the aviation industry.

Interest, however, has been revived recently as studies have been accomplished linking pilot personalities and stress coping strategies (Dillinger, Wiegmann & Taneja, 2003). Other recent pilot personality studies have been done linking personality characteristics to successful pilot candidates. Some of these findings include characteristics such as stable, tough minded, extroverted (Bartram, 1995), logical, outgoing, and attention to detail (Picano, 1991). Chidester, Kanki, Foushee, Dickinson, & Bowles (1990) found that personality factors contributed to crew effectiveness and that goal orientation, independence and intrapersonal personality characteristics were predictors of team performance in aerospace environments (Fitzgibbons, Davis & Schutte 2004). Most of these studies have focused on the military and commercial pilots, but there has been less research done concerning personality profiles of student pilots, specifically student pilots enrolled in an academic aviation flight program.

Kreienkamp (1983) conducted a study to see if there was a significant relationship between the similarity of flight instructor and student pilot perceptive styles and the performance of the student pilot. Kreienkamp used the MBTI to determine personality preferences among thirty-two subjects for his study. He found that only the extrovert-introvert differences between male student pilots and their flight instructors compared with student pilot flight training time were statistically significant (Krienkamp, 1983). These results indicated that

personality types may be a useful variable in instruction. In 1994, Kreienkamp produced a similar study to determine if students and instructors with the same personality type increased performance. Kreienkamp (1994) used thirty-five private pilot subjects for this particular study. The hypothesis that student pilots who are matched with their flight instructors on the basis of perceptive similarity will learn to fly in less time was rejected.

Research conducted in 1986 and 1987 at the University of North Dakota (UND) also used the MBTI to determine if matching student and instructor personality profiles was an advantage to training pilots more efficiently. The researchers concluded that students who were matched with instructors of similar personality profiles excelled early in training, but after initial flight training, the differences disappeared (Deitz & Thoms, 1991). Another study (Roen, 1991) involved 222 student pilots enrolled in the Center for Aerospace Sciences at UND, which is one of the largest aviation programs in the United States offered for professional pilots. The findings of this study were that 21.1 percent reflected the ESTJ profile, 11.7 percent were ISTJ, and 10.3 percent were ESTP.

Statement of the Problem

Due to the growth and popularity of the MBTI, the instrument has been used for years in career/occupational counseling (McCaulley, 1990). For many high school students or adults looking to make an occupational change, choosing a career can be a difficult choice. Personality profiling can help individuals obtain a better understanding of them and perhaps help them make better career decisions. In *Do What You Are* (Tieger & Barron-Tieger, 2001) the authors identify different occupations and associate them with personality types that would suit various careers and jobs. Current research shows that there is a relationship between personality type and job satisfaction (Miller, 1992). Past research identifies technological careers as having a prominent personality type or types (Tieger & Barron-Tieger, 2001). More research concerning personality type preference for pilots could aid individuals who are interested in professional pilot training and better inform university flight training programs with respect to student pilot recruitment and retention.

RESEARCH QUESTIONS

Is there a statistically significant common personality type among student pilots who were admitted into the Aviation Flight Program at Southern Illinois University Carbondale?

Is there a statistically significant common personality type combination among student pilots who were admitted into the Aviation Flight Program at Southern Illinois University Carbondale?

METHODOLOGY

The purpose of this study was to determine if there is a statistically significant common personality type or common combinations of type within the personality profiles among students who enrolled in the Aviation Flight Department at Southern Illinois University at Carbondale (SIUC). The study was conducted using eighty-three students in the Aviation Flight Program. These students were all in their first semester at SIUC and were either a student pilot or a private pilot. The individuals selected for the study were all enrolled in the private pilot ground school (AF 200) as well as one of two beginning flight courses, AF 199 or AF 201. The Aviation Flight Department uses a combination of high school grade point average (GPA), high school class rank, and American College Testing (ACT) scores as the selection criteria. Currently, admittance requirements include a high school GPA of 3.0, a class rank in the upper third of the graduating class and an ACT score of 24. These standards are slightly higher than those for general admission to SIUC, but comparable to other flight programs across the country (D. Jaynes, personal communication, June 21, 2005).

Measures

The instrument used to determine the personality profile of the participants was the Myers Brigg Type Indicator (MBTI) Form M (Myers et al., 1998). The MBTI is a 93 item self report instrument that measures psychological type based on the preferences described in Jungian theory (Kahn, Nauta, Tipps, Gailbreath & Charttrand, 2002). The MBTI uses responses

from 47 word pairs and 46 phrases to describe one's personality preferences among the four dichotomies; Extraversion-Introversion (E-I), Sensing-Intuition (S-N), Thinking-Feeling (T-F), and Judging-Perceiving (J-P) (Kahn et al., 2002). The Form M was used within the limits specified by Consulting Psychological Press, Inc. and was administered by a certified professional from Southern Illinois University Carbondale. There is a wealth of validity and reliability data that exists for the MBTI (Capraro & Capraro, 2002; Cohen, Cohen & Cross1981; Carlyn, 1977; Harrison, 1967; Stricker & Ross, 1962; Thompson & Borrello, 1986).

A demographic questionnaire was also given independently of the MBTI to establish that the students who participated in this study met the requirements for the Aviation Flight Program at SIUC. Demographic data such as age, ACT score, high school GPA and high school class rank were asked of the students in this questionnaire.

Procedures

All students entering the Aviation Flight Program at SIUC are required to take AF 200, Primary Flight Theory. For the fall semester of 2005, there were three sections of this course offered. Eighty-five students were enrolled in AF 200. Of these eighty-five students, eighty-three participated in this study.

Each student in AF 200 was given a letter stating the purpose of the study. The study was strictly voluntary and all information was confidential. Students were then given the MBTI by a qualified professional to determine the personality preferences of each individual. The demographic questionnaire was given to the students at the same time. This questionnaire and the resulting data were independent from the data received from the MBTI. Both the MBTI and the questionnaire were administered in a classroom setting in mid semester. Students were assured that their participation would not influence their training program.

Data Treatment

The first portion of the data that was evaluated was the 16 MBTI personality types of the study population relative to the MBTI types of the general population. Because the percentages of the personality types vary among the general population, further statistical analysis was conducted to compare the study population relative to the general population. The general population data was retrieved from The Myers Briggs Foundation website (The Myers Briggs Foundation, 2006).

To determine whether there was a statistically significant difference between the MBTI types of the Aviation Flight student population and the general population, a chi-square (χ^2) distribution was conducted. In the χ^2 distribution, the observed (O) frequencies (number of each MBTI personality type in the study population) were compared to the expected (E) frequencies (percentage of each MBTI personality type in the general population). The critical value (χ^2cv) of 24.996 was obtained by determining that the degree of freedom equal to 15 at the .05 level (Hinkle, Wiersma & Jurs, 1988). To determine which MBTI preferences were major contributors to any statistical significance, the standardized residual was computed for each of the categories. When a standardized residual for a category is greater than 2.00, one can conclude that it is a major contributor to the χ^2 value. The standardized residual is defined as $R = O - E / \sqrt{E}$ (Hinkle et al., 1988).

To further evaluate the data, the combination groupings that were studied were the sensing-intuition (S - N) and the judger-perceiver (J – P). A χ^2 distribution was conducted looking at the NP, SP, SJ, and NJ combinations of the study population relative to the general population. The critical value (χ^2cv) of 7.815 was obtained based on a degree of freedom equal to 3 at the .05 level (Hinkle et al., 1988). To determine which MBTI combinations were major contributors to any statistical significance, the standardized residual was computed for each of the categories.

Finally, a χ^2 distribution was conducted looking at the scores of each individual dichotomy of the study population relative to the general population. The critical value (χ^2cv) of 3.841 was obtained by using a degree of freedom equal to 1 at the .05 level (Hinkle et al., 1988). To determine which MBTI dichotomies were major contributors of any statistical significance, the standardized residual was computed for each of the categories.

RESULTS

The first research question was: Is there a statistically significant common personality type among student pilots who were admitted into the Aviation Flight Program at Southern Illinois University Carbondale? All of the sixteen MBTI personality types were represented among the population except for INFJ. The most represented personality types among the aviation students were ENFP (13.25%), ISTP (12.05%), ISTJ (10.84%) and ENTP/INFP (9.64%). These personality types relative to the total population differ in many ways. The highest percentage of the general population fall within the personality types ISFJ (13.8%), ESFJ (12.3%), ISTJ (11.6%), and ESTJ (8.7%) (see Figure 1) (The Myers Briggs Foundation, 2006).

There is a statistically greater percentage of aviation flight students with the types ISTP, ENTP, INFP and INTJ relative to the average percentage of the general population. Conversely, the types ISFJ, ESFJ and ISFP were found to be statistically under represented in the student population relative to the general population. In Table 2, the results of the χ^2 analysis on all sixteen types indicated that these seven types had a statistically significant departure from the general population. This finding would indicate that these personality types are drawn to aviation as a career.

The second research question was: Is there a statistically significant common personality type combination among student pilots who were admitted into the Aviation Flight Program at Southern Illinois University Carbondale? Of the four dichotomies, the combination groupings that were studied were the sensing-intuition (S - N) and the judger-perceiver (J – P). The percentages of these two groupings among the Aviation Flight students were NP (37.35%), SP (30.12%), SJ (18.07%), and NJ (14.46%).

Table 2. *Calculation of χ^2 for MBTI scores of Aviation Flight Students relative to general population*

Type	O	E	$(O - E)^2 / E$	R
ISFJ	2	11.45	7.80	-2.79*
ESFJ	1	10.21	8.31	-2.88*
ISFP	1	7.30	5.44	-2.33*
ISTP	10	4.48	6.79	2.61*
ENTP	8	2.66	10.75	3.28*
INFP	8	3.65	5.18	2.28*
INTJ	6	1.74	10.40	3.22*
ISTJ	9	9.63	0.04	-0.20
ESTJ	3	7.22	2.47	-1.57
ESFP	7	7.06	0.00	-0.02
ENFP	11	6.72	2.72	1.65
ESTP	7	3.57	3.30	1.82
ENFJ	4	1.99	2.02	1.42
INTP	4	2.74	0.58	0.76
ENTJ	2	1.49	0.17	0.41
INFJ	0	1.25	1.25	-1.12
Total	83	83.17	67.22 = χ^2	

*Note. Critical value = 24.996. O = Number of Aviation Flight Students. E = General Population. R = Standardized residual. *Denotes statistical significance @ (.05).*

Figure 1 - Comparison of MBTI Type - Aviation Flight vs. General Population

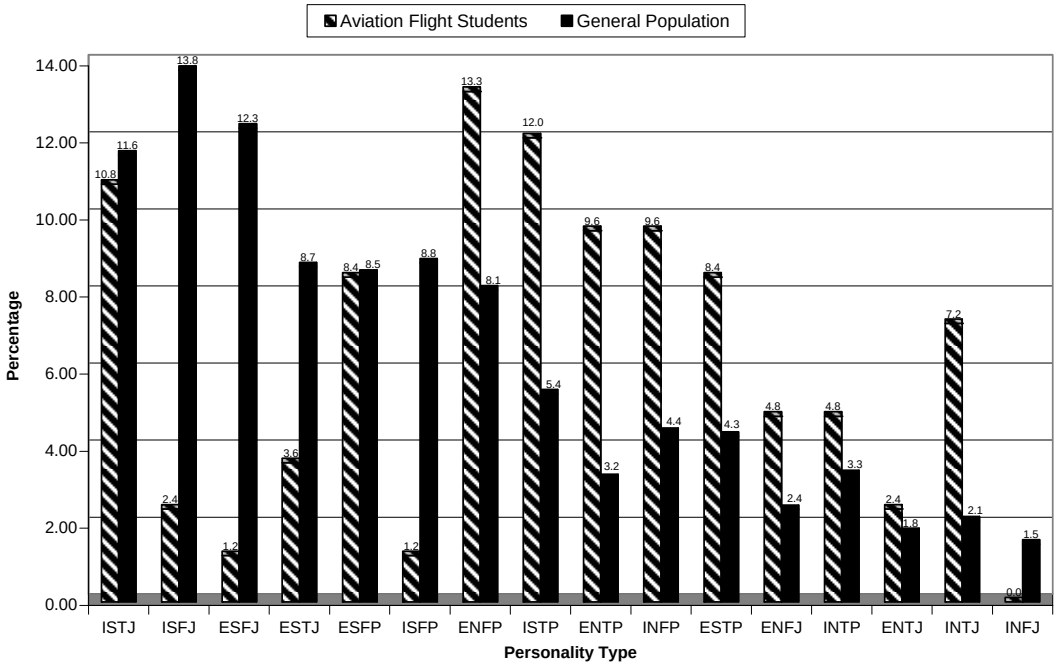

Figure 1. Comparison of MBTI Type – Aviation Flight vs. General Population

The percentages of the total population within these two groupings were NP (19%), SP (27%), SJ (46.4%) and NJ (7.8%) (see Figure 2). The results of the χ^2 analysis on the four combinations indicated that three of the four combinations of the student's types had a statistically significant departure from the general population. In Table 3, the NP, which was over represented among the students and SJ, which was under represented among the students had the greatest departure of the groupings from the general population. This finding would indicate that the NP preference is drawn more to aviation as a career.

Table 3. *Calculation of χ^2 for MBTI two letter combinations of Aviation Flight Students relative to general population*

Type	O	E	$(O - E)^2 / E$	R
NP	31	15.77	14.71	3.84*
SP	25	22.41	0.30	0.55
NJ	12	6.47	4.72	2.17*
SJ	15	38.51	14.35	3.79*
Total	83	83.16	34.08 = χ^2	

*Note. Critical value = 7.815. O = Number of Aviation Flight Students. E = General Population R = Standardized residual. * Denotes statistical significance @ (.05).*

Figure 2 - MBTI Type Breakdowns - Aviation Flight vs. General Population

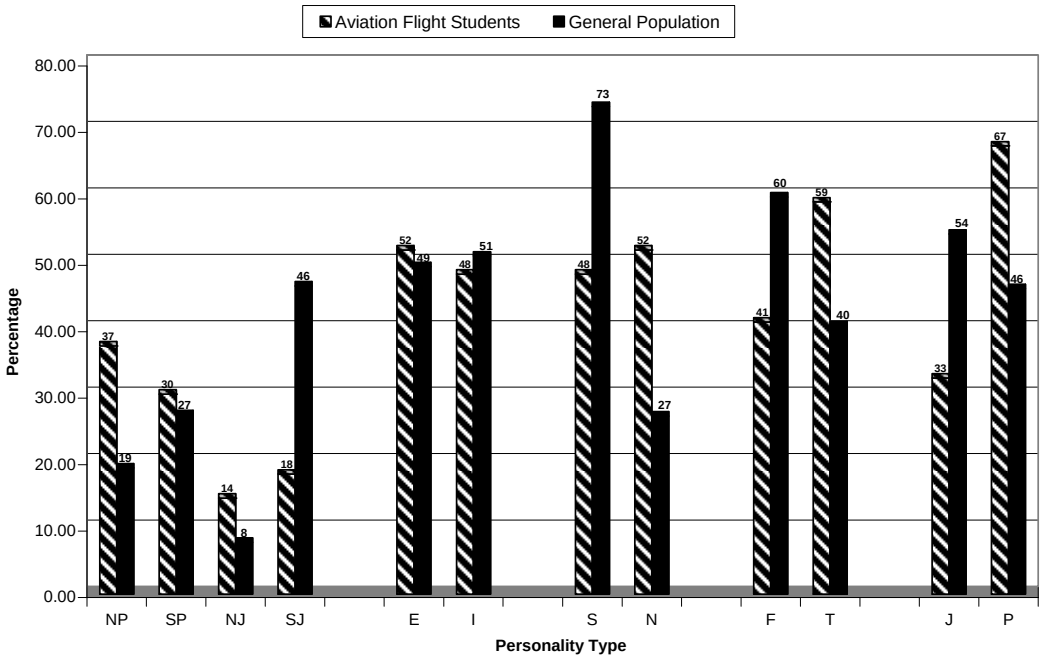

Figure 2. MBTI Type Breakdowns – Aviation Flight vs. General Population

Finally, the data were used to investigate each of the four individual dichotomies. The percentages for the study population were as follows E (51.81%), N (51.81%), T (59.04%) and P (67.47%). The percentages of the total population were I (50.9%), S (73.4%), F (59.8%) and J (54.2%) (see Figure 2). In Tables 4, 5, 6 and 7, the results of the χ^2 analysis on each of the four dichotomies indicated that three of the four dichotomies of the student's types had a statistically significant departure from the general population, with the S – N and J – P dichotomies having the greatest variance.

Table 4 *Calculation of χ^2 for MBTI (E – I) preference of Aviation Flight Students relative to general population*

Type	O	E	$(O - E)^2 / E$	R
E	43	40.92	0.11	0.33
I	40	42.25	0.12	0.35
Total	83	83.17	0.23	$= \chi^2$

*Note. Critical value = 3.84. O = Number of Aviation Flight Students. E = General Population. R = Standardized residual. * Denotes statistical significance @ (.05).*

Table 5. *Calculation of χ^2 for MBTI (S – N) preference of Aviation Flight Students relative to general population*

Type	O	E	$(O - E)^2 / E$	R
S	40	60.92	7.19	-2.68*
N	43	22.24	19.37	4.40*
Total	83	83.16	$26.55 = \chi^2$	

*Note. Critical value = 3.84. O = Number of Aviation Flight Students. E = General Population. R = Standardized residual. * Denotes statistical significance @ (.05).*

Table 6. *Calculation of χ^2 for MBTI (T – F) preference of Aviation Flight Students relative to general population*

Type	O	E	$(O - E)^2 / E$	R
T	49	33.53	7.14	2.67*
F	34	49.63	4.92	-2.22*
Total	83	83.16	2.06 = χ^2	

*Note. Critical value = 3.841. O = Number of Aviation Flight Students. E = General Population. R = Standardized residual. * Denotes statistical significance @ (.05).*

Table 7. *Calculation of χ^2 for MBTI (J – P) preference of Aviation Flight Students relative to general population*

Type	O	E	$(O - E)^2 / E$	R
J	27	44.99	7.19	-2.68*
P	56	38.18	8.32	2.88*
Total	83	83.17	15.51 = χ^2	

*Note. Critical value = 3.841. O = Number of Aviation Flight Students. E =General Population. R = Standardized residual. * Denotes statistical significance @ (.05).*

The separate demographic questionnaire was given independently of the MBTI and the results indicated that the students had an average age of 19.6, average ACT score of 23.9 and an average high school grade point average of 3.3 on a 4.0 scale. These results met the requirements for admission into the Aviation Flight Program at SIUC.

DISCUSSION

The results of this study did not find any personality type that comprised a statistical significant percentage of the study population. This study focused on the statistical significance of the personality types of the student population relative to the general population.

The data revealed that there were seven of the personality types that had a significant variance between the student population and the general population. The over represented ISTP, ENTP, INFP and INTJ types suggest that these personality types are drawn to the aviation industry and specifically to the Aviation Flight Program at SIUC.

In Gifts Differing (Myers, 1980), Myers references a study that was conducted by Laney (1949) that analyzed preferences separately concerning college fields of study. The study revealed that the NT combination was the highest percentage for the sciences at 57%. Next was NF at 26% and then ST at 12% of the study population. Although all of the types that were over represented in this study are different from each other, there are some commonalities among them. The ENTP and INTJ both have some similar characteristics. Both of these individuals would be attracted to careers in logic and would focus their attention on future possibilities (Tieger & Barron-Tieger, 2001). They would also want to use their abilities in theoretical and technical development. The INFP individuals would also turn their attention to future possibilities and use their abilities in theoretical development. It is likely that the INFP individuals would not be as interested in focusing on logic and technical development. The ISTP individuals would be more interested in facts rather than possibilities and would use their abilities in technical fields that deal with facts (Myers, 1980).

In Laney's (1949) study, SF individuals only accounted for 5% of the population that chose science as a field of study in college. ISFJ, ESFJ and ISFP types were found to be under represented in the student population. These three types also have some similarities among them. The SF individuals tend to focus their attention on facts and enjoy occupations

that provide practical help and service for people (Myers, 1980). This study confirmed the data presented by Laney (1949).

The combination grouping that this study focused on was the S – N function and the J – P grouping. The S – N dichotomy was chosen because it refers to the way an individual will acquire or access information. This is an important function for pilots as they tend to have to absorb a lot of information in a short period of time (Rose, 2001). The J – P dichotomy was chosen because it reflects whether an individual relies more on the judging process or the perceptive process in dealing with the outside world. This is an important dichotomy for pilots as they are confronted with situations that require them to make effective and efficient decisions (Rose, 2001).

The groupings that had statistical significance compared to the general population were the NP, NJ and SJ combinations. The NP and the NJ were over represented among the students, where as the SJ grouping among the student population was under represented relative to the general population. In the aviation industry, a pilot may find both an S preference and an N preference useful. A pilot could use the S preference to excel in the use of checklists, the routine of details and the use of skills that are learned through repetition (Tieger & Barron-Tieger, 2001). A pilot could use the N preference to solve new problems and enjoy learning new skills.

Pilots may use their senses on a daily basis when needing to remember a large number of facts and details. The pilot that prefers intuition, however, should be aware of these facts and details but may more easily be able to look at the big picture and anticipate future events (Myers, 1998).

The judger and perceiver types may also excel in different areas (Tieger & Barron-Tieger, 2001). A pilot with a J preference may enjoy working with a plan and following it, where as a P preference may be better at adapting to new situations and multi tasking. The characteristics of both the judger and perceiver could be useful in a career as a pilot, however, the pilot preferring perception may find it easier to adapt to the normal work activities within the job. The job requires the ability to adapt quickly and multi-task because a pilot is often dealing with a constantly changing work environment (Rose, 2001).

The NP and NJ had a higher number among the study population as compared to the general population. The SJ had the lowest percentage of the student population, where as the NP had the highest percentage among all the combinations.

Finally, the student population for each individual dichotomy had a higher preference for the E, N, T and P. Of these, the N, T and the P were over represented among the Aviation Flight students when compared to the general population. The higher thinking preference in the student population suggests that pilots with a thinking preference will like the analysis of the job and putting things in logical order as well as, tend to make their decisions on an impersonal basis and reprimand people when necessary (Myers, 1998).

CONCLUSIONS

The purpose of this study was to determine if there is a statistically significant common personality type or common combinations within the personality profiles among students who enrolled in the Aviation Flight Department at Southern Illinois University at Carbondale (SIUC). The findings of Roen's (1991) study revealed that 21.1 percent reflected the ESTJ profile, 11.7 percent were ISTJ, and 10.3 percent were ESTP. The results from Roen's study were not supported by this study. The results of this study indicated that the most common personality types were ENFP (13.25%), ISTP (12.05%), ISTJ (10.84%), ENTP (9.64%) and INFP (9.64%). When looking at these data compared to the general population, it was determined that there was no statistically significant difference among the types ENFP and ISTJ. Further analysis determined that the personality types of ISTP, ENTP, INFP and INTJ were found to be statistically significant and were over represented when compared to the general population.

When the different personality types were analyzed further, the data suggested that among the student population, the NP and NJ combinations were found to be statistically significant and were over represented when compared to the general population. In addition,

the N, T and P preferences were also found to be statistically significant and were over represented among the student population.

RECOMMENDATIONS

While these data results, at first glance, did not indicate a significant number of any particular personality types, there were personality types and combinations that did show some statistical significance. This study focused on student pilots that were interested in aviation as a career. Further studies similar to this should be conducted increasing the number in the study population. Similar studies should be conducted correlating the subjects MBTI score to their ACT score and grade point averages to aid in effective recruitment for flight schools.

It is recommended that future studies examine the personality preferences of pilots at different levels to explore if the correlation between success rate and personality preferences has a statistical significance. The MBTI could be a valid and useful tool for career counseling and assessment for the Aviation Flight Department at SIUC and other flight training departments. Future studies using the MBTI could aid those individuals who are thinking of becoming professional pilots as their career choice.

REFERENCES

Ashman, A., & Telfer, R. (1983). Personality profiles of pilots. *Aviation Space & Environmental Medicine, 54*(10), 940-943.

Bartram, D. (1995). Personality factors in pilot selection: Validation of the Cathay Pacific Airways selection procedures. In R.S. Jensen (Ed.) *Proceedings of the Eight International Symposium on Aviation Psychology* (pp. 1330-11335). Columbus, OH: The Ohio State University.

Capraro, R. M. & M. M. Capraro (2002). Myers-Briggs Type Indicator score reliability across studies: A meta-analytic reliability generalization study. *Educational & Psychological Measurement, 62*(4), 590-602.

Carlyn, M., (1977). An assessment of the Myers-Briggs Type Indicator. *Journal of Personality Assessment, 41*, 461-473.

Chidester, T., Kanki, B., Foushee, H., Dickinson, C., & Bowles, S. (1990). Personality factors in flight operations: Volume I. Leader characteristics and crew performance in a full-mission air transport simulation. (NASA Technical Memorandum-102259.) Moffett Field, CA: NASA Ames Research Center.

Cohen, D., Cohen, M., & Cross, H. (1981). A construct validity study of the Myers-Briggs type indicator. *Educational and Psychological Measurement, 41*(3), 883-891.

Comrey, A. L. (1983). An evaluation of the Myers-Briggs type indicator. *Academic Psychology Bulletin, 5*(1), 115-129.

Deitz, S. R., & Thoms, W. E. (1991). *Pilots, personality, and performance*. New York, NY. Quorum Books.

Dillinger, T. G., Wiegmann, D. A., & Taneja, N. (2003). *Relating personality with stress coping strategies among student pilots in a collegiate flight training program.* University of Illinois, Aviation Human Factors Division. Savoy, IL.

Fine, P. M., & Hartman, B. O. (1968). *Psychiatric strengths and weaknesses of typical Air Force pilots* (SAM-TR-68-121). Brooks AFB, TX: USAF School of Aerospace Medicine.

Fitzgibbons, A., Davis, D., & Schutte, P. C. (2004). *Pilot Personality Profile Using the NEO-PI-R.* Norfolk: Old Dominion University. (NTIS No. 20000105204)

Ganesh, A. & Joseph, C. (2005). Personality studies in aircrew: An overview. *Indian Journal of Aeropsace Medicine, 49*(1), 54-62.

Harrison, N. W. (1976). Validation of Jung's typological framework. *Dissertation Abstracts International*, 1976, (Sept), 37 (3-A), 1967.

Hinkle, D. E., Wiersma, W., & Jurs, S. G. (1988). *Applied statistics for the behavioral sciences.* Boston: Houghton Mifflin Company.

Kahn, J. H., Nauta, M. M., Gailbreath, D. R., Tipps, J. & Chartrand, J. M. (2002). The utility of career and personality assessment in predicting academic progress. *Journal of Career Assessment, 10*(1), 3-23.

Kreienkamp, R. A. (1983). *Flight instructor-student pilot perceptive similarity and its effect on flight training time*. Unpublished masters thesis, University of North Dakota, Grand Forks, North Dakota, USA.

Kreienkamp, R. A. (1994). *Flight Instructor-Student Pilot Learning Style Similarity and its effect on Flight Training Efficiency*. Unpublished doctoral dissertation, Oklahoma State University, Stillwater.

Lawrence, G. (1996). *People types & tiger stripes*. Gainesville, FL: Center for Applications of Psychological Type.

McCaulley, M. H. (1990). The Myers-Briggs type indicator: A measure for individuals and groups. *Measurement & Evaluation in Counseling & Development, 22,* 181-196.

Miller, M. J. (1992). Synthesizing results from an interest and a personality inventory to improve career decision making. *Journal of Employment Counseling, 29,* 50-59.

The Myers & Briggs Foundation. (2005). MBTI Basics. Retrieved July, 7, 2005, from http://www.myersbriggs.org/my%5Fmbti%5Fpersonality%5Ftype/mbti%5Fbasics

The Myers & Briggs Foundation. (2006). How frequent is my type? Retrieved February 20, 2006, from http://www.myersbriggs.org/my_mbti_personality_type/my_mbti_results/how_frequent_is_my_type.asp

Myers, I.B. (1980). *Gifts Differing*. Palo Alto, CA: Consulting Psychological Press.

Myers, I. B. (1998). *Introduction to type*. Palo Alto, CA: Consulting Psychologists Press.

Myers, I. B., & McCaulley, M. H. (1985). Manual: *A guide to the development and use of the Myers-Briggs Type Indicator.* Palo Alto, CA: Consulting Psychologists Press.

Myers, I. B., McCaulley, M. H., Quenk, N. L., & Hammer, A. L. (1998) MBTI Manual: *A guide to the development and use of the Myers-Briggs Type Indicator.* Palo Alto, CA: Consulting Psychologists Press.

North, R. A., & Griffin, G. R. (1977). *Aviator selection 1919-1977* (NAMRL SR 77-2). Pensacola, FL: Naval Aerospace Medical Research Laboratory, Naval Air Station.

Pearman, R. R. & Albritton, S.C. (1997). *I'm not crazy I'm just not you*. Palo Alto, CA: Consulting Psychological Press.

Picano, J. (1991). Personality types among experience military pilots. *Aviation, Space, and Environmental Medicine, 62*(6), 517-520.

Pittenger, David J. (1993). The utility of the Myers-Briggs type indicator. *Review of Educational Research, 63,* 467-488.

Roen, G. D. (1991). Is peter pan flying your plane? In S. R. Deitz & W. E.Thoms (1991), *Pilots, personality, and performance* (pp. 71-84). New York, NY. Quorum Books.

Rose, R. G. (2001). Avweb.com. *Practical use of the pilot personality profile*. Retrieved July 18, 2005, from http://www.avweb.com/news/aeromed/181606-1.html

Roscoe, S. N. (1980). *Aviation psychology*. Ames, Iowa. The Iowa State University Press.

Stricker, L. J. and Ross, J. (1962). A description and evaluation of the Myers-Briggs Type Indicator (Educational Testing Service Research Bulletin 62-6). Princeton, New Jersey: Educational Testing Service.

Thompson, B. & Borello, G. M. (1986). Construct validity of the Myers-Briggs type indicator. *Educational and Psychological Measurement, 60,* 174-195.

Tieger, P.D. & Barron Tieger, B. (2001). *Do what you are: Discover the perfect career for you through the secrets of personality type*. Boston, MA: Little, Brown and Company.

Wicklein, R. C. & J. W. Rojewski (1995). The relationship between psychological type and professional orientation among technology education teachers. *Journal of Technology Education, 7,* 57-74.

Zemke, R. (1992, April) Second thoughts about the MBTI. *Training Magazine, 29*(4), 43-47.