

## Psychological type and undergraduate student achievement in pharmacy course in Military Medical University

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**Abstract:** The Myers-Briggs Type Indicator (MBTI) was given to 264 students in an undergraduate Pharmacy course at a military medical university. Selected MBTI personality types were compared for achievement in the course using a t-test to compare total points earned. High grades were earned by students stronger in the traits of introversion (I) and judgment (J), whereas the extraverted (E) and perceptive (P) types had the lowest grades and dropped out of the course in the largest numbers. When combinations of MBTI types were compared, the highest grades were earned as follows: IJ > SJ > ST > IS (S: Sensing; T: Thinking; J: Judgment). This ranking indicates that a sensing personality also has a strong relationship to achievement in this pharmacy course when it is combined with judgment, thinking. Instructors and students need to be aware of the relationship between personality and learning so that they can modify their teaching style and learning behavior to enhance academic achievement.

**Key words:** Myers-Briggs Type Indicator; personality type; learning styles; clinical education; science teaching

### 1. Introduction

Much has been written about past, present, and future of undergraduate education. Most college professors begin their teaching careers with the idealistic notion that they can stimulate all their students to be interested in pharmacy, biology, etc., and to learn a lot. After a few years of teaching, their idealism fades when they realize that some students, for reasons unknown, have great difficulty in understanding the subject matter presented in their course. This inability to reach all students causes much frustration and soul-searching as to the cause of student failure. One possibility is that an individual's personality type can increase a student's ability to succeed in one area of study but push them toward failure in a different academic area. Over the past several decades, educational researchers have reported on the implications of student personality types related to individual achievement and satisfaction. One of the instruments that have been used to determine personality type is the Myers-Briggs Type Indicator (MBTI), which measures differences in how individuals prefer to use their perception and judgment (Myers, McCaulley, Quenk & Hammer, 2003).

On the basis of theory of psychological types by Carl Jung, the MBTI measures personality preferences

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defined by four dichotomous pairs of mental functions or attitudes. Irrational mental functions, sensing (S) or intuition (N), relate to how an individual perceives information, while rational mental functions, thinking (T) or feeling (F), provide insight into how one makes judgments or decisions based upon their perceptions. A sensing person prefers to use one or more of his or her five senses in gathering facts or information, while intuition types look for meaning or relationships in their observations. Thinking individuals are inclined to make logical, impersonal decisions, while feeling types prefer to make a judgment based more on their personal values and their effect on others. The two opposite pairs of mental attitudes, extraversion (E) or introversion (I) and judging (J) or perceiving (P), represent how individuals prefer to orient or direct their time and energy and how one deals with the world around them, respectively. Personality results from a preference for and an interaction of these attitudes and functions. The various combinations of the four dichotomies result in sixteen possible personality types designated by letters representing each of the preferred mental attitudes and functions. A person's MBTI profile consists of scores on each of the four two-part scales, thus yielding 16 possible personality types (e.g., ESTJ, INFP, etc.).

Research has been done using the Myers-Briggs Type Indicator (MBTI) in a variety of disciplines including education. According to CPP, including (Consulting Psychologists Press) the Myers-Briggs Type Indicator (MBTI) instrument publisher, more than 2 million assessments are administered annually in the United States. The MBTI tools are available across the globe in 30 languages and it is purported to be the most widely used personality inventory in the world.

Only a few studies have examined the relationship of personality type to science education. Some studies have shown that the MBTI profile is related to the selection of a college science major (McCaulley, M. H., 1977; Rowe, M. B., 1978). Melear gave the MBTI to 673 non-major undergraduate students in an introductory biology course that used a structured learning environment with defined goals and deadlines (Melear, C. T., 1990). Melear found that the typical non-major could be described as an ESFP type: interested in working on real problems with other people rather than on abstract problems in an impersonal atmosphere. The EP students in this biology course had the lowest achievement of any personality type. This poor performance is understandable, since the course structure favored the IJ types who like to learn by themselves in an orderly, planned environment. This study was designed to measure the relationship of personality type to achievement in a more advanced undergraduate course (pharmacy) that had a mixture of science and non-science majors, many of whom were preparing for medically related professions.

## 2. Methods

At the beginning of the 2003-2004 academic years, 264 second-year students at the Fourth Military Medical University were asked to participate in this study by taking the Myers-Briggs Type Indicator instrument. Participations were voluntary, and results were anonymous. In order to obtain truthful MBTI results, individuals taking this instrument were assured that their results would be kept confidential.

The Myers-Briggs Type Indicator, form M, is a ninety-three-item, forced-choice instrument containing both word-pair and phrase questions. It is the most widely used personality instrument in the world, whose results reflect innate psychological or mental dispositions. Internal consistency reliability based on split-half and coefficient alpha methods of a national sample range from 0.88 to 0.95 (Myers, McCaulley, Quenk, & Hammer, 2003).

The scores of pharmacy course examination were obtained at the end of the semester. The data were analyzed using a Statistical Package for The Social Sciences (SPSS10.0) t-test program to compare the total points (100 points maximum) earned in the course by different combinations of MBTI personality types. The type combinations chosen for analysis were those previously reported as having some effect on academic achievement. The students who did not finish the course were compared with students receiving 80 or higher total points as to the number of persons in selected personality type categories.

### 3. Results

Comparisons of the total course points for selected personality type combinations are given in Table 1. Using a probability level of 0.05, significant differences were as follows: I > E, J > P, SJ > NT, ST > NT, INT > ESP and J were almost significantly higher than P. If the probability is adjusted for running multiple t-tests using the Bonferroni equation ( $\alpha = 0.05/\text{number of t-tests}$ ), significant comparisons were I > E, J > P, and IJ > EP.

**Table 1 T-test analysis of achievement between different MBTI types**

Personality types compared	N	Mean total points	SD	t-value	Two-tail probability
E	134	74.32	15.22	2.88	<0.01
I	130	79.53	14.13		
S	180	74.71	16.24	1.94	>0.05
N	84	70.47	17.28		
T	182	75.66	15.15	1.08	>0.05
F	82	73.56	13.23		
J	138	78.45	12.66	3.27	<0.01
P	126	73.21	13.39		
ES	57	72.65	13.76	1.48	>0.05
IN	52	73.86	15.88		
ES	57	72.65	13.76	1.09	>0.05
IS	64	75.42	14.23		
EN	67	73.92	13.77	1.08	>0.05
IN	52	73.86	15.88		
EN	67	73.92	13.77	0.61	>0.05
IS	64	75.42	14.23		
NF	57	73.43	13.55	0.32	>0.05
NT	71	73.21	14.21		
SJ	65	79.45	16.32	2.38	<0.05
NT	71	73.21	14.21		
NT	71	73.21	14.21	0.26	>0.05
SF	47	73.88	13.33		
SF	47	73.88	13.33	1.97	>0.05
ST	69	78.45	13.23		
EP	74	72.90	13.52	1.79	>0.05
IJ	84	80.21	16.43		
INJ	34	77.72	14.54	2.42	<0.05
ESP	42	70.06	13.04		

Compared with the students who dropped the course, some interesting differences are seen (Table 2). More of the high-achievement students were of the I, T, and J types, whereas the students who dropped were higher in E, S, and P types. These differences also show up when combination types are examined; the top students were more the SJ, IJ, and IN types, whereas the students dropping the course were more the EP, ES and SF types.

**Table 2 Comparison of selected personality types of top 52 students to 38 students who dropped out in the course**

Personality types compared	Number of students	
	Top students in course	Students dropping in course
E	22	29
I	30	9
S	32	20
N	20	18
T	29	13
F	23	25
J	33	12
P	19	26
EP	9	20
IJ	21	9
SF	16	19
ST	19	17
SJ	27	11
NT	15	8
ES	17	15
IN	22	10

#### 4. Discussion

The results of this study agree in many ways with previous research on personality types and achievement in college. As what was found by Schurr and Ruble for achievement in general studies courses (Schurr & Ruble, 1986). In this pharmacy course the IJ students (80.21 points) were significantly higher achievers than the EP students (72.9 points). The higher grades of the INJ (77.72 points) over the ESP students (70.06 points) indicate that the course favors the person who can work well alone, is interested in abstract thinking, and is well organized and motivated. The EP students had the lowest total points (72.90) of any combination of two types and also dropped out of the course in the largest numbers. The low achievement of the EP types agrees with Melear, who studied college biology students and concluded that “the EP students not only achieve the lowest, but are twice as likely to be the lowest achievers.” A large number of EP dropouts have also been reported for the Naval computer-assisted instruction (CAI) programs (Hoffman, & Waters, 1982). Successes in CAI courses favor those who can concentrate by themselves, pay attention to details, and stay with a single task until completion, which favors the IJ over the EP personality type. Not all of our findings agree with those of prior studies. Whereas Rowe found summer science research students to be more N than S (Rowe, M. B., 1978), the S and N types in this study earned nearly equal grades. Studies by McCaulley, Schurr and Ruble, and Charlton emphasize the importance of combinations of the E-I and S-N scales, ranking success in science in this order: IN > EN > IS > ES (McCaulley, M. H., 1977; Schurr & Ruble, 1986; Charlton, R. E., 1980). In this pharmacy course, the ranking for these combinations was IN > IS > EN > ES, with no significant difference found between EN and ES, While previous research emphasized N over S for grades between N and S. In fact, when N is combined with certain other types, it seems to be lower achievement in pharmacy.

In conclusion, what can we learn from the results of this study? As currently taught, pharmacy favors students who can work efficiently by themselves (I), live in a planned, orderly way (J), and are interested in the practical applications of science in their lives (S). The EP types are especially prone to failure in this course. Instructors and students should be made aware of the impact of personality on learning so that they can modify

teaching styles and learning behaviors. Science instructors can use a variety of teaching activities in their courses to help motivate the different personality types (Lawrence, G., 1984). The EP students especially will need to become more organized in their study habits and develop their concentration and reasoning skills. As teachers, we need to emphasize that all personality types are valuable, but the learning environment in each course may favor one type over another so that some students will have to modify their attitudes and study skills if they want to be succeed. It must be noted that this study examined only the relationship between achievement in Pharmacy and personality type. The study did not take into account other variables that could influence achievement, such as student background in the sciences etc. Variables in student academic background should be included in future studies of personality type and achievement.

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