Comparison of personality styles between students enrolled in osteopathic medical, pharmacy, physical therapy, physician assistant, and occupational therapy programs

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Research has demonstrated that students with specific personality styles tend to choose particular professions. Even within a discipline, differences in personality traits are evident. With differences in personality styles reported in other professions, the question arises, are there differences in personality styles between the health professions? As such, this study was undertaken to determine if differences in personality style exist between pharmacy and other health profession students. Such information can help educators guide prospective students into compatible careers or to counsel students who are having a difficult time completing the curriculum. In addition, this information can help enlighten health profession students about the differences in personality and how these differences may manifest themselves in the workplace.

The following null hypothesis was tested: There is no difference in personality traits between osteopathic, pharmacy, physical therapy, physician assistant, and occupational therapy students. The instrument used to survey the students was the Myers-Briggs Type Indicator (MBTI). The MBTI is a forced-choice, self-report personality inventory developed to measure variables in Carl Jung's theory of psychologic type. The MBTI consists of 126 questions, representing four underlying bipolar constructs: Extroversion-Introversion (E/I), Sensation-Intuition (S/N), Thinking-Feeling (T/F), and Judgment-Perception (J/P). The four constructs are combined into a profile of which 16 possibilities exist.

The MBTIs completed by 1508 osteopathic, 654 pharmacy, 165 physical therapy, 211 physician assistant, and 70 occupational therapy students were used in the analyses. Chi-square analyses were conducted on the four bipolar constructs as well as the 16 profile types. Significant differences were found on the E/I , S/N and J/P dimensions, as well as the nine profile types. The results lend support to the idea that people choose professions partially based on personality traits.

(Key words: Personality style, learning styles, medical education, vocational psychology, osteopathic medical students, pharmacy students, physician assistants, physical therapists)

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Educational research and development efforts are most often directed at the improvement of teaching while neglecting students' learning styles.[1] Besides being marginally effective, an exclusive focus on improving teaching methods may lead to reinforcement of inappropriate and nontransferable learning strategies. This focus has important considerations in medical education, given the importance of transferring classroom knowledge and skills to job situations.

Learning style is best understood as the composite characteristic cognitive, affective, and physiologic factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment. Learning style is a structure of neural organization and personality that both molds and is molded by human development and the learning experiences of home, school, and society.[2]

Studies have demonstrated a relationship between academic performance and students who were taught in their preferred learning style.[3] For example, Nelson and colleagues[4] found that college students who were assessed on their learning styles, received an interpretation of their strengths and weaknesses, and were provided instructional sessions on applying these strengths and weaknesses achieved significantly higher grade-point averages and higher retention rates than those students who were assessed on their learning styles and only received an interpretation of their strengths and weaknesses, and those who received no learning style intervention.[4]

Research has also demonstrated that students with specific personality styles, a basic structure of learning style, tend to choose particular professions.[5,6] Mathews[6] found that mathematics and humanities students were more independent and applied, while education majors preferred social and conceptual situations. Even within a discipline, differences in personality traits are evident. Stewart[5] discovered a significant difference in personality between undergraduate marketing students pursuing degrees in sales or advertising and undergradu-

Table 1
Demographic Data

Sex/Age	OM* (%)	Pharmacy (%)	PT† (%)	PA‡ (%)	OT§ (%)
Male	66.0	44.0	10.0	39.0	10.0
Female	34.0	56.0	90.0	61.0	90.0
Age (y)	27.6	25.2	25.3	28.4	25.3
Ethnic group	OM* (%)	Pharmacy (%)	PT† (%)	PA‡ (%)	OT§ (%)
Asian	8.0	12.0	8.0	5.0	5.0
Black	5.0	5.0	3.5	3.0	5.0
Hispanic	11.0	27.0	8.0	11.0	7.5
White	74.0	53.0	80.0	78.0	80.0
Other	2.0	3.0	0.5	3.0	2.5

*OM: Osteopathic medicine
†PT: Physical therapy
‡PA: Physician assistant
§OT: Occupational therapy

ate marketing students pursuing degrees in marketing management.

The health professions are no different. Research indicates a dominant personality style among students enrolled in medicine, nursing, pharmacy, physical therapy, and dentistry programs.[7-11] In addition, research demonstrates that personality styles among health profession students tend to remain constant over time.[12]

With differences in personality styles reported in other professions, are there differences in personality styles between the health professions? For example, is there a dominant personality style among nursing students that differs from that of pharmacy students? A review of the literature would indicate that differences in personality styles exist; however, different instruments with varying psychometric qualities were used, making strong comparisons difficult. As such, the study reported herein was undertaken to determine if differences in personality style exist between pharmacy and other health profession students. Such information would be valuable to educators and counselors who guide students and to instructors who should adapt teaching methods to fit students' learning styles.

Methods

This retrospective-descriptive study was designed to assess the personality traits of health profession students. We tested this null hypothesis: There is no difference in personality traits between students in osteopathic medicine, pharmacy, physical therapy, physician assistant, and occupational therapy.

The instrument used to survey the students was the Myers-Briggs Type Indicator (MBTI). The MBTI is a forced-choice, self-report personality inventory developed to measure variables in Carl Jung's theory of psychologic type. The MBTI consists of 126 questions, representing four underlying bipolar constructs:

- ☐ Extraversion-Introversion (E/I),
- ☐ Sensation-Intuition (S/N),
- ☐ Thinking-Feeling (T/F), and
- ☐ Judgment-Perception (J/P).

The four constructs are combined into a profile of which 16 possibilities exist. For example, a person can have a profile type of ESTJ (Extroversion, Sensation, Thinking, Judgment). Research has established evidence of the MBTI's validity and reliability.[13]

The bipolar constructs are defined as follows: *Extroverts (E)* tend to focus on the outer world of people and things, while *Introverts (I)* focus on the inner world of ideas and impressions. *Sensors (S)* focus on the present and on concrete information gained from senses, while *Intuitives (N)* focus on the future with an emphasis on patterns and possibilities. *Thinkers (T)* base their decisions on logic and objective analysis, while *Feelers (F)* base decisions primarily on values and subjective evaluations of person-centered concerns. *Judgers (J)* prefer a planned and organized approach to life, while *Perceptors (P)* enjoy a flexible, spontaneous approach to life.

As part of a southern health science school's core curriculum, the MBTI is regularly administered to physician assistant, physical therapy and occupational therapy students during the first semester of the first professional year, and to osteopathic medicine and pharmacy students during the first semester of the second professional year. The purpose of administering the MBTI is to give students insight into their specific learning and personality styles. Students are given class time to complete the MBTI. This study was approved by the university's institutional review board.

Explanations of the MBTI, as well as an opportunity to ask questions are presented to students before the MBTI is administered. Participation is voluntary, and the results are confidential. After students have completed the MBTI, results are scored and returned to students with explanations; again, class time is used to present the results. For this study, analyses are based on data taken from the following time frames: osteopathic medical students (9 years; 1988-1996), pharmacy students (8 years; 1989-1996), physician assistant students (4 years; 1993-1996), and physical therapy and occupational therapy students (3 years; 1994-1996).

Results

The MBTIs completed by 1508 osteo-

pathic medicine, 654 pharmacy, 165 physical therapy, 211 physician assistant and 70 occupational therapy students were used in the analyses. Demographic data are presented in *Table 1*.

To see if our hypothesis (There is no difference in personality traits between osteopathic medicine, pharmacy, physical therapy, physician assistant and occupational therapy students) holds true, we conducted chi-square analyses of the data. The analyses were calculated on the four bipolar constructs, as well as the 16 profile types. Results are presented in *Table 2* and *Table 3*. The relatively small number of occupational therapy students resulted in frequencies of less than five for some of the profile types. This small number made statistical inference in some cases difficult.

A significant difference was found on the E/I dimension with pharmacy students (P<.005) more likely to be introverts and physician assistant (P<.05) students preferring the Extroverted dimension. A significant difference (P<.005) was found on the S/N dimension. Pharmacy students (P<.005) preferred the S dimension, while osteopathic medicine students (P<.005) preferred to use intuition to a greater degree. No statistical significant difference was discovered on the T/F dimension. A significant difference (P<.10) was discovered on the J/P dimensions, with pharmacy students showing a strong J preference.

The chi-square analyses calculated on the 16 profile types (chi-square = 135.77, df = 60, P<.005) indicated the distribution of profile types was not homogenous across disciplines. To identify specific differences, the chi-square analyses were decomposed to inspect for cell-specific contributions. The decomposed chi-square analysis indicated:

- Osteopathic medicine medical students are more likely to be INFP (P<.10), ISFJ (P<.05), and ENTP (P<.005);
- Pharmacy students are more likely to be ISTJ (P<.01) and ISFJ (P<.005);
- Physical therapy students are more likely to be ESFJ (P<.005), and less likely to be ISTP (P<.10);
- Physician assistant students are less likely to be ENTP (P<.005) and INFJ (P<.05), and more likely to be ESTJ (P<.05);
- Occupational therapy students are less likely to be ENFJ (P<.10).

Table 2
Chi-square Analyses for Groups: Myers-Briggs Type Indicator Personality Preferences

Preference	OM* (n=1508)	Pharmacy (n=654)	PT† (n=165)	PA‡ (n=211)	OT§ (n=70)
Extrovert vs Introvert					
Extrovert	885	318	111	131[c]	44
Introvert	623	336[a]	54	80	26
Sensing vs Intuition					
Sensing	843	424[a]	108	149	42
Intuition	665[a]	230	57	62	28
Thinking vs Feeling					
Thinking	835	353	76	110	34
Feeling	673	301	89	101	36
Judging vs Perceiving					
Judging	860	419[d]	107	134	34
Perceiving	648	235	58	77	36

[a] Significant at P<.005; [c] Significant at P<.05

[d] Significant at P<.10

*Osteopathic medicine
†PT: Physical therapy
‡PA: Physician assistant
§OT: Occupational therapy

Discussion

Clearly no value judgment is made concerning any of the functions. For example, it is neither better nor worse to be a Thinking or Feeling personality type. In certain situations or contexts, however, each function possesses various advan-

Table 3
Chi-square Analyses for Groups
Myers-Briggs Type Indicator Profiles

Profile	OM* (n=1508)	Pharmacy (n=654)	PT† (n=165)	PA‡ (n=211)	OT§ (n=70)
ISTJ¶	169	107[b]	20	29	5
ISFJ	96[c]	78[a]	10	15	6
INFJ	63	23	3	1[c]	0
INTJ	63	28	3	7	3
ISTP	56	32	2[d]	7	2
ISFP	40	23	7	10	2
INFP	78[d]	21	4	5	4
INTP	59	24	5	6	4
ESTP	93	33	10	14	5
ESFP	72	28	12	11	7
ENFP	123	46	11	23	8
ENTP	113[a]	28	7	1[a]	4
ESTJ	197	70	20	38[c]	6
ESFJ	112	53	27[a]	25	9
ENFJ	74	29	15	11	0[d]
ENTJ	100	31	9	8	5

*OM: Osteopathic medicine
†PT: Physical therapy
‡PA : Physician assistant
§OT: Occupational therapy
¶E: Extrovert; F: Feeling, N: Intuition, J: Judgment, T: Thinking, P: Perception
[a] Significant at P<.005: [b] Significant at P<.01 [c] Significant at P<.05: [d] Significant at P<.10

tages and disadvantages. The key is in recognizing this fact. Students or practicing health professionals who are misplaced may find themselves suffering dissonance or high anxiety (or both).

Comparing the Extrovert/Introvert dimension reveals that a larger proportion of osteopathic medical students, and physical therapy, physician assistant and occupational therapy students prefer the Extrovert dimension, while more pharmacy students prefer the Introvert dimension. According to McCaulley,[14] about 75% of the population in the United States are extroverts; so it is not surprising to find the majority of students enrolled in the osteopathic medicine, physical therapy, physician assistant and occupational therapy programs are Extroverts. These findings are also consistent with Lowenthall and Meth[15] who discovered that most pharmacy students are Introverts. Research examining the relationship between academic achievement and the Introvert/ Extrovert dimension are mixed.

Lowenthal and Meth[15] found that Introverts do not perform any better in school than extroverts. Rezler and colleagues,[16] however, reported that high achievers prefer the Introvert dimension. Similarly, Borg and Shapiro[17] discovered that Introverts possess a greater probability of achieving a higher grade than extroverts.[17] Research focusing specifically on medical education also provides mixed conclusions. Lacorte and Risucci[18] found that Extroverts score higher on the American Board of Pediatrics Intraining Examination. Conversely, Tharp[19] discovered that Introverts achieved higher grades in a human physiology course. This brings up an interesting question: Are the requirements to gain admittance into the various programs filtering out Extroverts or Introverts, or is each discipline more attractive to the respective dimensions?

A significant difference was discovered on the Sensing/Intuition dimension. Pharmacy students were more inclined to use the Sensing function, while a greater proportion of osteopathic medical students preferred the Intuitive function than would be expected. In terms of school performance, pharmacy students who prefer the Intuitive function have a tendency to score higher on timed multiple choice tests (Scholastic Aptitude Test, Pharmacy College Admission Test, and the National Association of Boards of Pharmacy Licensure Examination).[15] Yet, medical students who prefer the Sensing function have an easier time passing the National Board of Medical Examiners (NBME) examinations and in-service training examinations. These disparate statistics may be a result of a need by Sensors to grasp the concrete world.[20] Sensors tend to perform better on objective measures, while Intuitives display a greater proclivity for theoretical constructs. For example, research indicates that Sensors perform better in lecture-discussion formats.[21]

Examining the five health science disciplines reveals no significant differences across the Thinking/Feeling dimension. Research demonstrates that in education, Thinking preferences tend to perform better in math and science.[22] For instance, O'Donnell[23] discovered that in medicine, Feelers were less likely to pass the NBME exams and to drop out at a greater rate.[23]

All disciplines preferred the Judging dimension, with the sole exception of occupational therapy students. Research indicates that Judgers perform better in science-based courses and examinations.[24] This study lends support to conclusions of earlier research. It is possible

that with a larger sample, a greater proportion of occupational therapy students would prefer the Judging dimension.

Comment

This study was undertaken to see if there was a difference in personality traits between pharmacy, physical therapy and occupational therapy, physician assistant, and osteopathic medical students. Results indicate significant differences across the E/I, S/N, and J/P dimensions. Data also indicate a logical trend in profiles. Specifically, the dominant profile—ESTJ—for osteopathic medicine and physician assistant means they are practical, realistic, with a natural head for business or mechanics. The dominant profile for physical and occupational therapy students—ESFJ— indicates they are warm-hearted, talkative, whose main interest is in things that affect people's lives. The dominant profile for pharmacy students—ISTJ—means they are serious, thorough, logical, and realistic.

These results support the notion that people choose professions partially based on personality traits.[5-7] For example, if past research is any indication, osteopathic medical students from this study will specialize in obstetrics-gynecology, general practice, internal medicine, psychiatry, child psychiatry, pediatrics, or neurology. This information could be used by educators to help guide prospective students into compatible careers or to counsel students who are having a difficult time completing the curriculum. In addition, this information can help enlighten students of osteopathic medicine, pharmacy, physical therapy, physician assistant, or occupational therapy about the differences in personality and how these differences may manifest themselves in the workplace.

This study was conducted in a large, urban, southern setting. Differences may exist in other locales. Nevertheless, the findings are notable and supported by previous research. Future research in health-profession education and practice should concentrate on the effect personality has on each profession. Which MBTI profile defines the most satisfied practicing osteopathic physician or physician assistant, and whether the admissions process filters out excellent candidates or merely self selects candidates, need to be determined. Insightful and reasoned analysis will help make the profession stronger.

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