An Exploration of the Relationships Between Multiple Mini-Interview Scores and Personality Traits

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Objective. To explore the relationship between pharmacy students’ social and behavioral competencies assessed using multiple mini-interviews (MMIs) and their personality traits.

Methods. A retrospective study was conducted using data from two Doctor of Pharmacy (PharmD) cohorts. Students’ self-reported scores from an externally validated tool completed during their first professional year that assessed five personality traits (openness to experiences, conscientiousness, extraversion, agreeableness, and emotionality) were collected. Students’ scores on empathy, integrity, adaptability, critical thinking, and collaboration were collected during MMIs conducted during the admissions process. Analysis of variance was used to test the homogeneity of the sample, and correlation analyses were used to determine the strength of relationships between variables.

Results. When examining for associations between students’ personality traits and their social and behavioral competencies measured during the MMIs, we found a few significant but very weak correlations with extraversion.

Conclusion. Our results revealed weak to negligible correlations between scores on competencies measured during the MMIs and personality traits, potentially because the assessments measured different constructs.

Keywords: personality; multiple mini-interview; admissions; non-cognitive, five-factor, Big Five

INTRODUCTION

The multiple mini-interview (MMI) method may be used to assess nonacademic or professional characteristics of applicants as part of an admissions or hiring process. MMIs were developed to address the shortcomings of the structured interview and differentiates among prospective students based on social and behavioral (also called non-cognitive or nonacademic) abilities. Evaluating applicants based on their social and behavioral skills is believed to improve the probability of selecting those applicants who are most likely to become successful practitioners, as many of the characteristics integral to the success of health care team members are social and behavioral. Since its first description in the literature, the MMI method has been replicated in medical schools, pharmacy schools, pharmacy and medical residency programs, and veterinary schools. While applicants’ MMI scores do not strongly correlate with their prior academic achievement, some researchers believe MMI scores on social and behavioral competencies may reflect applicants’ more intrinsic characteristics, such as personality.

Personality is an inherent trait from birth and may not be overly dictated by environment until an individual reaches their 30s. Personality traits have been associated with academic achievement in addition to interpersonal skills like cooperativity, empathy, ethics and leadership, trustworthiness, and other personal values. Researchers have established a five-factor structure for personality which includes: openness to experience, conscientiousness, extraversion, agreeableness, and emotional stability (or neuroticism). Openness to experience is characterized by a willingness to try new activities. People with higher levels of openness are open to unconventional ideas and beliefs, including those that challenge their existing assumptions. Conscientiousness reflects an individual’s awareness of their actions and the consequences of their behavior.
Often, they are generally careful to carry out the duties assigned to them. Extraversion is associated with being assertive and sociable rather than quiet and reserved, which would be consistent with the opposite end of the spectrum or introversion. Agreeableness measures friendliness and cooperativeness, and individuals high in this area often show prosocial behavior. Finally, emotionality (or neuroticism) is emotional stability. Individuals with high scores in this area are prone to experiencing negative emotions, such as anxiety, depression, and irritation, rather than being emotionally resilient.

These five personality traits have been implicated in student’s academic achievement (ie, their degree of success in school). For example, conscientiousness correlates the most with academic achievement. This relationship may be because these individuals have better time management strategies, and there is a positive relationship between higher scores on time management skills and higher levels of conscientiousness. In this study, the five-factor personality structure was used because of its reliability, validity, and prior research investigating its relationship to academic achievement.

Several studies have examined the relationship between MMI results and personality scores in various health disciplines, but never in pharmacy. Within the literature, significant correlations were discovered between extraversion and MMI performance. In addition, Griffin and Wilson found correlations between conscientiousness and agreeableness with MMI performance. However, associations between a single personality trait and MMI performance are often weak, with correlations under 0.3. Studies often only look at a composite or total MMI score instead of analyzing each MMI station separately. Therefore, we used a novel approach by performing subscale analyses with attention to composite MMI score.

Studies investigating the relationship between personality traits and MMI performance in pharmacy candidates are lacking. As pharmacy schools use the MMI method in the admissions process, it would be beneficial to know about their relationship to personality traits. The literature indicates that certain personality traits are associated with postsecondary academic performance and may influence success in different career paths within the profession of pharmacy. Thus, the results from both this and future studies may help provide additional guidance for either admissions or student affairs.

The goal of the study was to examine the relationship between MMI scores and personality traits in an effort to better understand the extent to which MMI scores reflect applicants’ personality rather than their social behavioral characteristics. We conducted an exploratory study regarding personality traits among enrolled students who had been assessed using the MMI method during the admissions process to identify any associations between MMI station scores and personality traits. This study will help advance our understanding of the relationship between personality assessments and MMI station scores and may provide insight into advancing applicant selection techniques.

METHODS

This was a retrospective study conducted in 2019 with Doctor of Pharmacy (PharmD) students from the class of 2018 (n=162) and class of 2019 (n=154) at a single institution. Personality data were obtained from students’ self-reported five-factor personality scores measured with an externally validated tool early in the spring semester of the first year of the curriculum. Personality data were collected as part of a first-year course that used the data to form course groups.

Students’ MMI station scores were obtained from the school’s admissions office. The traits assessed by the MMI stations included: empathy, integrity, adaptability, critical thinking, and collaboration (teamwork). A seventh, less-structured station was added that asked candidates why they were interested in admission to the school (ie, why UNC?). This station was designed in this manner to provide the candidates an opportunity to tell the interviewer more about themselves. Reliability of the MMI stations was high. An MMI was administered on both the Chapel Hill, North Carolina campus and on the satellite campus in Asheville, North Carolina.

Descriptive statistics were obtained on personality traits and MMI station scores. An analysis of variance (ANOVA) was used to determine homogeneity of the study population. As no significant differences were found between classes, data were combined for analysis. Spearman’s correlations were calculated to investigate possible relationships between factors. Cohen’s cutoffs were used to determine the strength of the association (.1 = small, .3 = medium, .5 = large). This study was considered exempt from further review by the University of North Carolina at Chapel Hill Institutional Review Board.

RESULTS

Two hundred ninety-one students (92.1%) were included in the study; 25 students (7.9%) were excluded because of missing data on the personality assessment. Upon admission, the two classes within the study had a grade point average of 3.5 and average composite PCAT score of 87%.

Performance on the multiple mini-interview stations can be found in Table 1 and summary of the personality
characteristics can be found in Table 2. Scores for both the MMI stations and personality traits included nearly the whole range of possible values.

Table 3 summarizes the association of each MMI station with a personality trait. Higher scores on the extraversion/introversion scale, indicating extraverted tendencies, were significantly correlated with integrity, adaptability, empathy, teamwork, and a thoughtful response to the “why UNC” station. However, the correlation coefficients suggested the strengths of these relationships were small ($r<.3$). The only other significant correlation was conscientiousness and critical thinking. Again, this was a weak relationship.

**DISCUSSION**

This is one of the first papers examining the relationship between student pharmacists MMI scores, a potential measure of social and behavioral competencies, and their personality traits. Our study found weak but significant relationships between extraversion and some of the social and behavioral competencies believed to be assessed at MMI stations. However, overall little association was found between scores on the competencies assessed at the MMI stations and the five-factor personality traits. This suggests that our MMI was not biased towards an applicant’s personality. In addition, our findings reflect the same low correlations as prior studies that examined overall MMI performance and personality.

When examining different personality traits of the students in the study, conscientiousness received the highest score. This trait is a measure of an individual’s self-discipline, and those who score higher tend to be more efficient and organized, as well as have a great need for achievement. This finding is not surprising for students seeking admission to a professional or graduate program that has very competitive admission criteria.

This study was conducted to ensure that the admissions process, specifically our MMI method, was not selecting or rejecting candidates because they had a certain personality trait. Based on these results, the MMI stations were not measuring personality, at least not as a single trait. A combination of certain personality traits could lead to higher scores, but no one trait was strongly associated with a candidate’s scores. This may be important because the student body should be diverse, which means accepting candidates with a wide variety of personality traits. Additionally, various personality traits and skills are required for success in different career paths within the profession of pharmacy.

We investigated the association of personality traits with MMI performance. The strength of the study was the reliability of the MMI metrics combined with a psychologically validated personality assessment. While there were some associations with the extraversion trait for admitted students, we do not have data for students who were not admitted.

This study had several limitations. First, the personality assessment tool required students to self-report their results using a web-based instrument. Although self-reported findings may have some degree of bias, personality studies often use self-reported tools. Moreover, the online instrument that we used had been validated for research purposes. Second, the data in this study were from a single institution and a single MMI process, which may limit the generalizability of the results. To help strengthen the rigor of the study, two cohorts of students were included, and data were drawn from well-designed and psychometrically supported data collection processes, as noted earlier. Third, this is an exploratory study and one of the first to examine the relationship between social and behavioral competencies believed to be assessed during MMIs and applicants’ personality traits. As researchers advance this line of inquiry, additional analyses that incorporate factors or data that may help explain the relationships between admissions, performance, and personality are warranted. Specifically, further investigation is needed to conclude if personality traits dictate overall decisions during the admissions process. To date, scores on qualities assessed at MMI stations do not seem to be associated with admitted students’ personality traits; thus, future

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**Table 1. Pharmacy School Applicants’ Performance on the Multiple Mini-Interview Stations (n=291)**

<table>
<thead>
<tr>
<th>Station No. and Construct Assessed</th>
<th>Score, Mean (SD)</th>
<th>Score, Minimum</th>
<th>Score, Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Teamwork</td>
<td>6.6 (1.9)</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>2-Teamwork</td>
<td>6.7 (1.9)</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>3-Integrity</td>
<td>7.2 (1.9)</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>4-Adaptability</td>
<td>7.4 (1.7)</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>5-Empathy</td>
<td>7.0 (1.9)</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>6-Critical thinking</td>
<td>7.1 (1.9)</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>7-Why UNC?</td>
<td>7.2 (1.9)</td>
<td>2</td>
<td>10</td>
</tr>
</tbody>
</table>

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**Table 2. Pharmacy School Candidates’ Performance on the Five-Factor Personality Traits (N=291)**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Score, Mean (SD)</th>
<th>Score, Minimum</th>
<th>Score, Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Openness to Experience</td>
<td>31.7 (24.9)</td>
<td>1</td>
<td>93</td>
</tr>
<tr>
<td>Extraversion</td>
<td>45.3 (28.7)</td>
<td>1</td>
<td>97</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>66.6 (23.9)</td>
<td>4</td>
<td>97</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>73.6 (21.4)</td>
<td>3</td>
<td>98</td>
</tr>
<tr>
<td>Emotionality</td>
<td>32.7 (24.3)</td>
<td>1</td>
<td>97</td>
</tr>
</tbody>
</table>
Table 3. Results of a Study to Identify Correlations Between Multiple Mini-Interview Station and Personality Traits in Pharmacy School Candidates (n=291)

<table>
<thead>
<tr>
<th>Personality Trait</th>
<th>Station 1 (Teamwork)</th>
<th>Station 2 (Teamwork)</th>
<th>Station 3 (Integrity)</th>
<th>Station 4 (Adaptability)</th>
<th>Station 5 (Empathy)</th>
<th>Station 6 (Critical thinking)</th>
<th>Station 7 (Why UNC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotionality</td>
<td>-.004</td>
<td>-.059</td>
<td>-.041</td>
<td>-.023</td>
<td>-.029</td>
<td>-.007</td>
<td>.089</td>
</tr>
<tr>
<td>p</td>
<td>.95</td>
<td>.053</td>
<td>.000</td>
<td>.000</td>
<td>.003</td>
<td>.91</td>
<td>.13</td>
</tr>
<tr>
<td>Extraversion</td>
<td>.11</td>
<td>.12</td>
<td>.21</td>
<td>.69</td>
<td>.62</td>
<td>.91</td>
<td>.18</td>
</tr>
<tr>
<td>p</td>
<td>.053</td>
<td>.046</td>
<td>.000</td>
<td>.036</td>
<td>.003</td>
<td>.003</td>
<td>.003</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>.001</td>
<td>.013</td>
<td>.082</td>
<td>.11</td>
<td>.042</td>
<td>.071</td>
<td>.046</td>
</tr>
<tr>
<td>p</td>
<td>.99</td>
<td>.82</td>
<td>.16</td>
<td>.063</td>
<td>.47</td>
<td>.23</td>
<td>.43</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>.050</td>
<td>.11</td>
<td>.007</td>
<td>.11</td>
<td>.11</td>
<td>.12</td>
<td>-.006</td>
</tr>
<tr>
<td>p</td>
<td>.40</td>
<td>.063</td>
<td>.91</td>
<td>.072</td>
<td>.072</td>
<td>.041</td>
<td>.91</td>
</tr>
<tr>
<td>Openness to Experience</td>
<td>.022</td>
<td>.042</td>
<td>.050</td>
<td>.057</td>
<td>.081</td>
<td>.079</td>
<td>.086</td>
</tr>
<tr>
<td>p</td>
<td>.71</td>
<td>.48</td>
<td>.40</td>
<td>.34</td>
<td>.17</td>
<td>.18</td>
<td>.14</td>
</tr>
</tbody>
</table>

* p < .05
b p < .01

Studies should focus on the whole application pool. This would include examining associations with MMI scores and the personality traits of the entire applicant pool (applicants admitted and denied admission).

CONCLUSION

This study examined relationships among personality traits as measured by the five-factor personality instrument and admission MMI scores of PharmD students. Based on this preliminary investigation, there appears to be little overlap of the scores on social and behavioral competencies assessed during the MMIs with personality traits for admitted students, which is preferred. While this study contributes to addressing a clear gap in the pharmacy literature, it must be advanced and expanded upon to generate a body of evidence that helps pharmacy practice and pharmacy education better understand the role of personality traits and social and behavioral competencies in student success.

REFERENCES