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Variation in personality traits of medical students between schools of medicine

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Variation in personality traits of medical students between schools of medicine

Abstract

Introduction: While there have been studies exploring the impact of personality on medical student selection and performance there has not been an investigation of the personality of students at different schools.

Method: Demographic data and responses to the NEO measure of personality traits were collected from medical students in the first two weeks of their enrolment (2011) in seven medical schools in Australia. Personality traits were analysed by school features, gender and age using logistic regression.

Results: Differences were detected between schools in the personality traits of Agreeableness and Conscientiousness. Higher Agreeableness and Conscientiousness were associated with attending an Undergraduate school (OR = 1.07 and 1.03, respectively) and a rural or community focussed school (1.06 and 1.03). Students attending a school that used interviews for selection had higher levels of Agreeableness (1.04) and lower levels of Neuroticism (0.96).

Discussion: This is the first study to demonstrate that personality traits differ between students entering different medical schools. While there seems to be logic behind some differences, others are perplexing. Further research should expand on these findings and the implications to schools in regards to attracting students through selection processes, mission statements and their broader social focus.

Keywords

between, students, medicine, medical, schools, traits, personality, variation

Disciplines

Medicine and Health Sciences | Social and Behavioral Sciences

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Variation in personality traits of medical students between schools of medicine.

Running title: Medical student personality

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Article 2063 words

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Abstract

Introduction

While there have been studies exploring the impact of personality on medical student selection and performance there has not been an investigation of the personality of students at different schools.

Method

Demographic data and responses to the NEO measure of personality traits were collected from medical students in the first two weeks of their enrolment (2011) in seven medical schools in Australia. Personality traits were analysed by school features, gender and age.

Results

Students who were older (OR=0.74, $p < 0.01$) were less likely to attend a postgraduate school but the students were more likely to have higher Agreeableness (OR=1.07, $p < 0.01$) and Conscientiousness (OR=1.03, $p < 0.01$) scores. A similar pattern was seen for students entering community focussed schools, while students entering schools that did not require an interview were less likely to have high Agreeableness (OR=0.94 $p < 0.01$) and Conscientiousness (OR=0.96 $p < 0.01$) scores.

Discussion

This is the first study to demonstrate that personality traits differ between students entering different medical schools. While there seems to be logic behind some differences, others are perplexing.

Abstract 171 words

Practice Points

- There is significant variation in the personality factors between students from different medical schools.
- Conscientiousness is known to predict performance in medical school, and anything that reduces the chances of high level Conscientious students being enrolled needs to be examined.
- Gender has no impact on the school chosen.
- Certain schools with specific policies/features may attract students with particular personality patterns.

Introduction

The personality of medical students has been well studied, including its relationship to student selection (Griffin and Wilson, 2012, Kulasegaram et al., 2010, Merlo and Matveevskii, 2009), career choice (McGrath and Zimet, 1977, Taber et al., 2011, Zeldow and Daugherty, 1991), academic performance (Hobfoll et al., 1982, Lievens et al., 2002, Lievens et al, 2009, Poropat, 2009, Shen and Comrey, 1997) and stress (Tyssen et al., 2007).

To our knowledge there has never been an investigation into whether the personality of students varies between medical schools. Nevertheless, differences between schools in terms of their focus, curriculum and/or selection procedure might be expected to impact on the student body in terms of the personality characteristics of students who are attracted and offered a place. This paper investigates the differences in personality of first year medical students commencing in seven different medical schools across Australia.

Personality

The measurement of personality has a chequered history with many different self report methods developed. The variation in instruments and theoretical approaches contributed to a lack of consensus in the field. However, in the 1970s Costa and McCrae (Costa and McCrae, 1976) developed a 3 factor model of personality – Neuroticism, Extraversion and Openness to experience, later adding two further factors, Agreeableness and Conscientiousness. The five factor model has become established as the most accepted model of personality and the NEO test (Costa and McCrae, 1992) is an instrument widely used in research and practice as a measure of this model.

Investigation into the personality of medical students has consistently demonstrated that Conscientiousness is the most significant predictor of academic performance (Doherty and Nugent, 2011) and, together with Neuroticism and Extraversion, contributes to the vulnerability to psychological stress in students and interns (Doherty and Nugent, 2011).

The relationship between medical school policy and practice with personality

The current paper investigates how students' personality affects the odds of their being enrolled at a particular medical school when schools are clustered by four differences in policy and practice. The first difference is whether or not the school focuses on rural medicine. Recent research (Jones et al., 2012) has shown that students who are interested in rurally-located medical practice have a different personality profile to those intending to work in urban areas, in particular higher levels of Openness, even after controlling for age and gender. Therefore, it is possible that medical schools that focus on the issues of rural medicine may attract applicants with certain personality attributes.

The second factor differentiating schools is whether or not they use interviews for selection and thirdly how the interview score contributes to ranking applicants. The use of interviews aims to select those with the non-cognitive qualities required of medical practitioners, such as communication and empathy (Wilson et al., 2012). A study by Griffin and Wilson (Griffin and Wilson, 2012) demonstrated that interview scores were significantly related to certain levels of Conscientiousness, Extraversion and Agreeableness. It is therefore possible that students who are selected by interview will have a different personality profile than those selected without the use of interviews. Furthermore, the effect of interviewing is likely to be greater when

interview scores form part of the ranking score for selection than when they are used only to exclude unsuitable candidates (Harris and Owen, 2007).

The final factor relates to the type of degree offered by the medical school.

Australian universities offer both undergraduate medical degrees (entry straight from high school) and postgraduate degrees (entry after the completion of an undergraduate university degree). Although research into career choice has a degree of consistency in terms of the influence of personality, (Borges and Osman, 2001, Borges and Savickas, 2002) how age or tertiary education affects this process is not clear. Nevertheless, there may be personality differences between those who enter a medical degree as undergraduates compared to postgraduates, for example the latter, having been exposed to broad ranging university degrees may be more open to experience than school leavers.

The research questions therefore become:

- Are there personality factors that predict entry to different medical schools?
- If so are they related to the type of school and / or the selection process?

Method

The Medical Schools Outcomes Database and Longitudinal Tracking Project (MSOD) (<http://www.medicaldeans.org.au/projects-activities/msod>) collects data on a large proportion of all medical students at commencement of their education in Australia. Data collection from each cohort of students is planned to continue until the establishment of their careers. Data collected includes school and admission data, demographic data, rural urban background, country of birth, language(s)

spoken and future career intentions. MSOD offers researchers the opportunity to collect additional information at the same time as the MSOD survey is completed.

Seven schools of medicine joined with researchers from Macquarie University to collect data from consenting year 1 medical students in the first two weeks of their enrolment in 2011. The schools reflected a broad spectrum of the types of medical schools within Australia.

Data consisted of the MSOD commencing questionnaire and an additional questionnaire designed for this and other studies. The only MSOD data used in this study were gender, age and school at commencement. The additional instrument included the short form of the NEO Personality Inventory (NEO-FFI), a well validated measure of the five factor model of personality (Costa and McCrae, 1992).

Participants rated their responses to 60 items on a 5-point Likert scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*), with factor scores having a possible range of 5 to 50. Note that high scores on each factor indicate a range of both strengths and limitations for different contexts.

International students were removed from the analysis as they undergo highly variable selection procedures and choice of school is significantly affected by variables other than those under investigation here.

The clusters of schools under investigation are:

1. Four year graduate entry programs vs five or six year undergraduate programs (called graduate entry and school leaver entry for convenience),
2. Regionally-based schools with a rural/community focus vs those without this emphasis,

3. Schools that use interview as part of selection vs schools that do not use an interview for selection (interview and non-interview), and
4. Schools that use interview scores to rank students during selection vs those schools that use the interview to exclude applicants (include and exclude).

TABLE 1 NEAR HERE

Additionally, the impact of gender and age was investigated. ANOVAs were used to determine differences in the five personality factors between students at the seven schools. Logistic regression with backward removal of non-significant items was used to determine the impact of personality on school enrolment. Significance was set at an alpha of 0.05 and all analyses were conducted using SPSS (version 20).

Ethics approval for the study was received from the Human Research Ethics committee of each participating institution.

Results

A total of 1291 students completed the MSOD commencing student survey. After excluding students who had not completed the personality profile, 1053 (81.6%) students remained in the study. After excluding the remaining international students this number reduced to 808 (62.6%).

Of those students who completed the MSOD, the response rates in the various schools for completion of the NEO ranged from 56.6% to 98.5%, with all but one school registering over 90% response rate. The numbers of participants from individual schools are not detailed as this would enable easy identification of each

school. The schools represent a mix typical of that seen in Australia and the number in the study represents almost half of the students entering medicine in 2011.

The majority of the sample were female ($n=423$; 52.4%) and age ranged from 15 to 55 years with a median of 21 years.

Table 1 shows the range of students' scores on the NEO in all seven schools.

ANOVA was used to compare scores. Differences were significant for all factors except Neuroticism. When the age of students was dichotomised around the median the only difference was a higher level of openness to experience in the older group ($F=13.9$, $df=1$, $p<0.01$). Female students had higher scores for Neuroticism ($F=36.3$, $df=1$, $p<0.01$), Extraversion ($F=5.4$, $df=1$, $p=0.02$), Agreeableness ($F=90.1$, $df=1$, $p<0.01$) and Conscientiousness ($F=10.5$, $df=1$, $p<0.01$).

Because of the gender and age related differences in personality, we controlled for both when analysing the school cluster comparisons using logistic regression with backward removal of non-significant factors. The analyses started with all NEO factors, gender (categorical) and age in the model.

Undergraduate compared to graduate entry schools

As expected, increasing age decreased the odds of being in an undergraduate school ($OR=0.74$, 95% CI 0.69 – 0.80, $p<0.01$). Higher levels of Agreeableness ($OR=1.07$, 95% CI 1.03 – 1.10, $p<0.01$) and Conscientiousness ($OR=1.03$, 95% CI 1.00 – 1.06, $p<0.05$) also predicted being in an undergraduate program.

High rural/community focus compared to low focus

Lower age (OR=0.96, 95% CI 0.93 – 0.99, $p=0.01$), higher Agreeableness (OR=1.06, 95% CI 1.03 – 1.08, $p<0.01$) and higher Conscientiousness (OR=1.03, 95% CI 1.00 – 1.05, $p<0.05$) increased the odds of being in a rural /community focussed school.

Interview compared to No Interview

The logistic regression demonstrated that decreases in age (OR=0.95, 95% CI 0.91 – 0.98, $p<0.01$), Agreeableness (OR=0.95, 95% CI 0.92 – 0.98, $p<0.01$) and Conscientiousness (OR=0.96, 95% CI 0.93 – 0.98, $p<0.01$) decreased the odds of being in a school that interviewed applicants.

Interview for Selection and Interview for Exclusion

Students with higher levels of Neuroticism (OR=1.04, 95% CI 1.01 – 1.07, $p<0.02$) and lower levels of Agreeableness (OR=0.96, 95% CI 0.92 – 0.98, $p<0.05$) were more likely to be in a school that used an interview to exclude students compared to one that used interview scores to rank students.

Gender was a not a significant factor in any of the analyses.

Discussion

In recognising that differences between schools in terms of focus, curriculum and selection procedure exist, we considered it reasonable to presume these factors might have an influence on characteristics of individuals attracted to that school and offered a place. This paper investigated the differences in levels of personality traits of first year medical students commencing in seven different medical schools across Australia.

As the survey was conducted within the first week as students matriculate in medical school, their personality scores do not reflect any influence of the course /school.

Comparison of entry type did not show any relationship to Openness to experience in graduate entry students. There was however an association between higher levels of both Agreeableness and Conscientiousness and entry to an undergraduate school.

Comparison of school focus showed lower levels of Agreeableness and particularly conscientiousness in schools with a lower emphasis on rural /community medicine. This is congruent with recent studies that have found that intention to practice in a rural location is associated with higher Agreeableness, self-discipline and self-directedness. (Eley et al., 2008, Jones et al., 2012)

We found higher Conscientiousness and Agreeableness in schools using interviews for selection. While the use of an interview for selection could be expected to favour higher Conscientiousness and agreeableness it is difficult to explain why extraversion was not also higher, given previous research (Griffin and Wilson, 2012) demonstrates that Extraversion is significantly correlated with performance in interviews. The results in relation to the use of interviews to exclude applicants were perplexing, although the small change in the Odds Ratio may mean that this is not a practical difference. While this selection method has been discussed in the literature (Harris and Owen, 2007) it is not widely used. Perhaps at these universities interviewers focus on identifying applicants with an obvious lack of interpersonal skills, so that those who are low, but not extremely low on Agreeableness and emotional stability are not excluded but retain their original ranking. This too is an area for further research.

The finding of lower levels for Conscientiousness in students associated with certain schools is concerning because Conscientiousness is a significant predictor of performance as a medical student (Doherty and Nugent, 2011, Lievens et al, 2009).

Strengths and limitations

This study's main strength resides in the large sample size and the range of medical schools typical of schools seen in Australia. Apart from Lievens et al (2009) there are no studies of the personality of the medical students on such a scale.

Care must be used when interpreting the results. We structured the study around the interplay between the personality characteristics of students attracted to the university and the attraction/selection process. Because the personality differences were not large, over-interpretation should be avoided as there may be other factors contributing to the results.

Conclusions

We have demonstrated variability in personality characteristics at course entry among medical students between schools and with respect to certain features of those schools. Future research will be required to determine whether the observed differences have an impact on predicting progress or future career paths. Such research is of importance given that medical schools seek to attract and enrol students who are a good match for that institution's educational and community goals.

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Declarations of interest

Nil

	Range of means	Significance (all 6 df)
NEO-N	18.2 – 20.6	F = 1.73 p = 0.11
NEO-E	29.8 – 32.6	F = 3.00 p < 0.01
NEO-O	29.0 – 31.6	F = 3.09 p < 0.01
NEO-A	32.5 – 34.6	F = 6.94 p < 0.01
NEO-C	30.9 – 34.2	F = 4.03 p < 0.01

Table 1 Variation in mean score across schools
and significance of differences (ANOVA)