

Personality Factors Associated With Resident Performance: Results From 12 Accreditation Council for Graduate Medical Education Accredited Orthopaedic Surgery Programs

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OBJECTIVES: To understand the personality factors associated with orthopedic surgery resident performance.

DESIGN: A prospective, cross-sectional survey of orthopedic surgery faculty that assessed their perceptions of the personality traits most highly associated with resident performance. Residents also completed a survey to determine their specific personality characteristics. A subset of faculty members rated the performance of those residents within their respective program on 5 dimensions. Multiple regression models tested the relationship between the set of resident personality measures and each aspect of performance; relative weights analyses were then performed to quantify the contribution of the individual personality measures to the total variance explained in each performance domain. Independent samples *t*-tests were conducted to examine differences between the personality characteristics of residents and those faculty identified as relevant to successful resident performance.

SETTING: Data were collected from 12 orthopedic surgery residency programs¹ throughout the United States. The level of clinical care provided by participating institutions varied.

PARTICIPANTS: Data from 175 faculty members and 266 residents across 12 programs were analyzed.

RESULTS: The personality features of residents were related to faculty evaluations of resident performance (for all, $p < 0.01$); the full set of personality measures accounted for 4%-11% of the variance in ratings of resident performance. Particularly, the characteristics of agreeableness, neuroticism, and learning approach were found to be most important for explaining resident performance. Additionally, there were significant differences between the personality features that faculty members identified as important for resident performance and the personality features that residents possessed.

CONCLUSION: Personality assessments can predict orthopedic surgery resident performance. However, results suggest the traits that faculty members value or reward among residents could be different from the traits associated with improved resident performance. (J Surg Ed ■■■■■) © 2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

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¹The full list of participating programs is available from the corresponding author upon request.

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COMPETENCIES: Interpersonal and Communication Skills, Professionalism, Practice-Based Learning and Improvement, Systems-Based Practice

INTRODUCTION

The criteria used to select residents for orthopedic surgery residency programs overwhelmingly rely on cognitive evaluations of a candidate's capabilities as a way to predict performance as a resident. Measures, such as US Medical Licensing Examination (USMLE) scores, medical school grades, and ranking within medical school classes, are used to evaluate candidates based on numeric indicators of their intellectual capabilities and technical skills.^{1,2} In addition, residency programs also consider subjective evaluations, such as interviews, letters of recommendation, and reviews of extracurricular activities. Presumably, these subjective evaluations are performed, in part, to gain an understanding of a candidate's personality as a way to predict "fit" within the program. However, while some evidence exists to support the widely held notion that cognitive assessments accurately predict resident performance, there is no evidence to suggest that unstructured interviews or letters of recommendation provide any useful indication of a candidate's future performance.³ Often, unstructured interviews are not based on any objective criteria or script that is consistent across candidates, and letters of recommendations are variable; therefore, the validity of these measures for predicting performance is nonexistent at best and, in fact, can introduce multiple forms of subjective bias at worst.⁴

Research from the field of human resource management has shown that a candidate's fit with the culture and values of a work environment can be a predictor of success in that job role.⁵ Personality assessments are a widely used method of predicting fit in corporate job settings and have been shown to be significantly related to job performance.⁶⁻⁸ These types of assessments measure qualities, such as a person's behavioral tendencies, attitudes, values, and motivators. Indeed, the role of an orthopedic surgeon is not simply a matter of accurate science and intellectual fortitude; it is also the capacity to work well with colleagues and to provide high quality patient care. Thus, personality measures can be a valuable tool in understanding a candidate's proclivity toward exhibiting effective interpersonal skills.

Recently, the medical community has moved toward gaining a better understanding of how such "noncognitive" measures can be used in the selection of orthopedic surgery residents for programs to which they are best suited.⁹ The Accreditation Council for Graduate Medical Education (ACGME) has provided guidelines for this purpose as a way to begin standardizing the use of noncognitive factors

in the development of future physicians.¹⁰ Indeed, a recent study with 54 applicants to neurosurgical residency programs showed that a personality assessment accurately distinguished between candidates that were rated as more versus less qualified for the role, as measured by USMLE Step 1 scores and publication productivity.¹¹ In addition, research suggests that noncognitive factors are predictive of successful leadership within healthcare settings.¹²

Using personality assessments to evaluate a candidate's selection into orthopedic surgery residency programs has far reaching implications. Anecdotal evidence from selection committee members in nationally ranked orthopedic surgery programs has suggested that many of the candidates who apply to their programs are highly (and similarly) qualified in terms of the traditional objective criteria (test scores, rankings, etc.), thus making it hard to distinguish between the quality of the final list of candidates.¹³ By adding a measure that evaluates personality traits, selection committees would have an additional, standardized data point to use to distinguish between candidates who will fit well into their programs and those who will not. Thus, programs can avoid the consequences of poor matches, namely residents who are highly qualified in technical and intellectual skill, but are less suited for the work environment, which reduces the time and resources directed toward those individuals that can instead be reinvested more productively into the program.¹³ Likewise, it may provide the candidate with the opportunity to consider how his or her personality features may be better or worse suited for particular programs and specialties.

Research on personality is largely based on the Five Factor Model: agreeableness, conscientiousness, extroversion, neuroticism, and openness. This is the preeminent model used among social scientists for the measurement of personality.¹⁴⁻¹⁷ This model, which is based on multiple sources of evidence, was developed by mathematically condensing large lists of personality traits into five categories.¹⁸⁻²⁰ Over time, it has repeatedly been shown that 5 factors consistently emerge as a cohesive set of personality trait groupings.^{17,21} Although scholars have sometimes disagreed on the terminology used to describe the 5 factors,²²⁻²⁴ using a five factor approach to measuring personality has been the most empirically investigated and supported model. In addition, research on this model has consistently shown that, within individuals, these characteristics are largely stable over time and represent a set of biologically predisposed traits.² Furthermore, these traits have been shown to be predictive of

²Conscientiousness is defined as a person's tendency toward order, diligence, and prudence, as well as an orientation toward high quality achievements. Agreeableness is defined as a person's tendency toward cooperation, interpersonal sensitivity, and positive temperament. Neuroticism is defined as the degree to which a person experiences negative emotions, such as anxiety and depression. Openness is defined as a person's intellectual curiosity about the world, as well as a propensity to be willing to try new things and take risks. Extroversion refers to a person's propensity toward being outgoing, sociable, and assertive.

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