



Are Surgeons Born or Made? A Comparison of Personality Traits and Learning Styles Between Surgical Trainees and Medical Students

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OBJECTIVE: Medical students and surgical trainees differ considerably in both their preferential learning styles and personality traits. This study compares the personality profiles and learning styles of surgical trainees with a cohort of medical students specifically intent on pursuing a surgical career.

DESIGN: A cross-sectional study was conducted contrasting surgical trainees with medical students specifying surgical career intent. The 50-item International Personality Item Pool Big-Five Factor Marker (FFM) questionnaire was used to score 5 personality domains (extraversion, conscientiousness, agreeableness, openness to experience, and neuroticism). The 24-item Learning Style Inventory (LSI) Questionnaire was used to determine the preferential learning styles (visual, auditory, or tactile). χ^2 Analysis and independent samples *t*-test were used to compare LSI and FFM scores, respectively.

SETTING: Surgical trainees from several UK surgical centers were contrasted to undergraduate medical students.

PARTICIPANTS: A total of 53 medical students who had specifically declared desire to pursue a surgical career and were currently undertaking an undergraduate intercalated degree in surgical sciences were included and contrasted to 37 UK core surgical trainees (postgraduate years 3-4).

RESULTS: The LSI questionnaire was completed by 53 students and 37 trainees. FFM questionnaire was completed by 29 medical students and 34 trainees. No significant difference for learning styles preference was detected between the 2 groups ($p = 0.139$), with the visual modality being the preferred learning style for both students and

trainees (69.8% and 54.1%, respectively). Neuroticism was the only personality trait to differ significantly between the 2 groups, with medical students scoring significantly higher than trainees (2.9 vs. 2.6, $p = 0.03$).

CONCLUSIONS: Medical students intent on pursuing a surgical career exhibit similar personality traits and learning styles to surgical trainees, with both groups preferring the visual learning modality. These findings facilitate future research into potential ways of improving both the training and selection of students and junior trainees onto residency programs. (J Surg Ed 73:768-773. © 2016 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: medical education, personality profiling, learning styles, medical student, surgical resident

COMPETENCIES: Patient Care, Medical Knowledge, Practice-Based Learning and Improvement

INTRODUCTION

The learning of practical skills in craft specialties, such as surgery, may be influenced by natural learner preferences for stimuli, which predominate in these fields. For example, the operating theater typically presents visual and kinesthetic stimuli to learners and may, therefore, favor individuals who possess particular preferences toward learning through these modalities.

Previous studies have shown that surgeons have significantly different learning style preferences to other medical specialists, with surgeons generally exhibiting a predilection for accommodator and diverger learning styles.¹ However, other authors have found no clear relationship between learning style and career choice among physicians and have

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cited clinical courses at medical school as being the most influential factor in career choice.² Similarly with studying nursing students, Laschinger and Boss³ found no relationship between learning style and preferred nursing specialty.

Evidence from the psychology literature implies that a certain level of overlap exists between personality attributes and preferred learning style,⁴ suggesting that these entities should not be considered in isolation. Both subjective opinions and objective research suggest that a specific “surgical personality” exists with unique identifiable characteristics; however, no clear consensus has yet been determined.⁵ Differences in the distribution of different personality traits have been shown between surgical residents and general population age-matched controls. Surgical residents (men and women) scored significantly higher for conscientiousness, extraversion, and openness than the general population.⁶ Other authors have suggested that this personality profile blueprint could be used to possibly identify those who would be most suited for work as surgeons,⁷ although others feel that at present this is not feasible⁸ and that there are significant difficulties with applicant “faking” of personality tests.⁹

Hoffman et al.¹⁰ compared the personality of surgical residents, nonsurgical residents, and medical students, and found that surgical residents had higher scores for conscientiousness and extraversion but less openness than medical students. Other studies have found that medical students have significantly different learning style preferences to surgeons.¹¹ However, these studies tend to investigate heterogeneous groups of medical students without a specific interest in pursuing a surgical career. What is not clear is whether surgical residents become more extraverted during the course of training and whether their preferred learning style evolves in line with this, or whether these findings are because of attrition through the years of the surgical training residency.¹⁰ Investigation of learning style and personality trait has huge implications for surgical education as it has been found that personality differences between teachers and learners affect students' evaluations of surgical clerkships,¹² and this in turn may affect career choice.¹³

This study investigates a cohort of medical students specifically intent upon undertaking a surgical career rather

than a generic, heterogeneous group. It examines both personality traits and preferred learning styles and aims to draw comparison with a cohort of surgical trainees (United Kingdom core surgical trainees equivalent to postgraduate years 3 and 4). We hypothesized that there would be no significant difference in both traits between the students and trainees.

MATERIAL AND METHODS

This was a cross-sectional study involving surgical trainees and medical students. Specifically, the cohort of medical students ($n = 53$) in this study had indicated a particular interest to pursue a future career in surgery. All students were in their fourth or fifth year of undergraduate study and undertaking a 1-year undergraduate surgical sciences degree. The surgical trainees ($n = 37$) were all UK core surgical trainees (a 2-year period of preresidency training during postgraduate years 3 to 4 whereby trainees acquire knowledge and skills by rotating through several allied surgical specialty posts).

Personality traits were assessed using the 50-item self-reported International Personality Item Pool Big-Five Factor Marker (FFM).¹⁴ This questionnaire, by assessing responses to 50 statements, measures the 5 domains of extraversion, conscientiousness, agreeableness, openness to experience, and neuroticism. Each of the 5 domains is measured by 10 items¹⁴ and scored from 0 to 5, with 5 indicating a higher disposition for that trait. A brief explanation of the domains and items used to measure them is given in Table 1.

Although many permutations exist for the exact definition of what comprises a learning style, the term broadly refers to the preferred manner in which an individual collects, processes, and perceives information for learning.¹⁵ Learning styles have previously been described as predominantly clustering into 3 modalities of learning; visual, auditory, and tactile styles.¹⁶ This study utilized a freely available 24-item self-reported Learning Style Inventory (LSI) Questionnaire to determine the preferential learning styles of students and trainees (available at: <http://www.personal.psu.edu/bxb11/LSI/LSI.htmShowResults>).

TABLE 1. The Big-Five Factor Questionnaire Domains

Domain	Description	Example Item
Extraversion	Gregarious and active individuals, typically confident in social situations	“I am the life of the party”
Conscientiousness	Individuals desiring to complete tasks to a high standard with good organization and efficiency	“I am always prepared”
Agreeableness	Altruistic individuals, kind, co-operative and sympathetic to others	“I sympathize with others' feelings”
Openness to experience	The extent of an individual's artistic, intellectual, and imaginative capability	“I am full of ideas”
Neuroticism	Tendency of an individual to be emotionally unstable and experience higher levels of anxiety or depression	“I get stressed out easily”

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