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Does gender impact personality traits in female versus male otolaryngology residents and faculty?

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ABSTRACT

Objective: Gender differences in personality have long been a subject of interest. This study assessed personality traits within female and male residents and faculty and evaluated for meaningful differences between the groups.

Methods: A series of web-based, commercially available, self-administered five factor-based personality assessments were given to otolaryngology residents and faculty at nine academic training programs. The psychometrically validated assessments evaluate innate personality 1) strengths, 2) challenges, and 3) motivators/values. Differences between groups were evaluated using the Mann-Whitney *U* test. A standardized measure of effect size, Cohen's d, was calculated to indicate the magnitude of gender differences. Subset analysis was done to examine differences between female and male residents and female and male faculty.

Results: Seventy-eight faculty (42.6%) and 104 residents (70.3%), responded, which included 63 female (34.6%) participants. Significant differences between females and males overall were found across four traits (mischievous, imaginative, altruistic, and commercial) out of twenty-eight (4/28; 14.3%). Subset analysis of residents revealed two statistically significant differences related to motivators/values (increased altruism in females and increased commercial in males). Faculty exhibited a statistically significant difference in one stress tendency (increased imaginative in males). When examining the seven total traits that exhibited a statistically significant difference between any of the groups (7/84; 8.3%), four were considered a small difference and three a moderate difference.

Conclusion: When personality trait differences were identified in both otolaryngology resident and faculty populations based on gender, they were relatively small. Overall, females and males in otolaryngology exhibit significant overlap in the distribution of their personality traits. Therefore, personality-based initiatives should focus on the individual, rather than perceived gender "norms."

"Imagine how much happier we would be, how much freer to be our true individual selves, if we didn't have the weight of gender expectations." Chimamanda Ngozi Adicie

Introduction

Personal and professional growth is impacted by personality. However, personality is often conflated with behavior. Rather, observed behavior is a function of both an individual's personality and environment.[1] Gender differences in personality have long been a subject of interest.[2–6] The published literature on this topic varies substantially and there is no consensus. Some studies have failed to identify gender differences, while others note significant differences across an extensive array of traits, aspects, and domains.[2–6] With respect to the latter, women are often noted to score lower in domains like assertiveness and score higher in areas such as warmth, positive emotions, politeness, and compassion.[2–4] However, there remains concern regarding the bias that can be inherent in these studies. Additionally, it is unknown how to best interpret and apply the findings in a way that enhances the well-being and productivity of all involved.

Many personality assessment tools exist, each with their own

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theoretical, cultural, and methodological origins. The Five Factor Model (FFM) - AKA The Big Five - categorizes traits into broad domains of Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism and encompasses much of the variance seen in personality via a robust, but simple, set of dimensions.[7]

The Hogan series of personality assessments are built on the FFM. These assessments provide insights into an individual's usual tendencies, stress tendencies, and motivators/values.[8,9] They were developed in 1976 and over two million assessments have been performed, validated, and utilized in the business sector for professional development. Prior research has demonstrated personality differences between otolaryngology residents and faculty.[10] To date, it is not known whether gender impacts personality traits in otolaryngologists. The objective of this study is to assess personality traits within female and male residents and faculty and evaluate for meaningful differences between the groups utilizing the Hogan series of assessments.

Materials and methods

Nine Accreditation Council for Graduate Medical Education otolaryngology training programs were invited to complete a series of psychometrically validated assessments. Briefly, the assessments are comprised of three inventories that provide information on (1) baseline personality characteristics or usual tendencies (Hogan Personality Inventory [HPI]), (2) tendencies that emerge under stress (Hogan Development Survey [HDS]), and (3) motivators, preferences, and values or drivers (Motivations, Values, Preferences Inventory [MVPI]). The assessments are comprised of a total of 600 questions and take 45 min to 1 h to complete. Most questions are short phrases to which respondents indicate the extent to which they agree or disagree (5-point Likert scale or Yes/No), to a given statement. Assessment results are reported on a 0 to 100 scale, with values at either end of the scale representing extremes of personality.

These assessments have been widely used in personality research and validated for both selection and development purposes. E-mail invitations to complete the online assessments were sent in June/July 2017, depending on the program. Invitations were unique to each participant and provided information to establish a personalized account. For this reason, it was not possible for any invited participant to complete more than one series of assessments. There were no incentives to participate, aside from gaining individualized psychometrically validated personality information and narrative feedback that could be used for professional development. Reminder emails were sent three times and assessment access was closed four weeks after the initial email.

An anonymized dataset was obtained from J3Personica (J3P) (Princeton, NJ). Only data from subjects who completed all three assessments were analyzed. Faculty or resident status and participant self-identification as male or female was noted. No other demographic information was collected.

The primary output was percentile data, which was then analyzed to compare differences in the assessed characteristics between female and male residents and faculty. The majority of the measures failed normality testing with the Shapiro-Wilk test. Consequently, the groups were compared using the Mann-Whitney *U* test. An initial α of 0.05 or less was determined to be statistically significant a priori. However, the significance level was adjusted to $p < 0.0167$ using the Bonferroni correction to control for multiple comparisons. A standardized measure of effect size, Cohen's d, was obtained to indicate the magnitude of gender differences.[11] Generally, differences are accepted as being small if Cohen's $d \geq 0.20$, moderate if ≥ 0.50, and large if ≥ 0.80. In contrast, Cohen's $d \leq 0.20$ are considered trivial.[11] All statistical calculations were made using SPSS software (version 24; IBM Corp., Armonk, NY).

The institutional review board at the corresponding author's institution deemed this to be non-human research due to the anonymized nature of the dataset.

Results

Seventy-eight faculty (42.6% total response rate) and one hundred and four residents (70.3% total response rate) from nine institutions completed all three assessments. Overall, there were 63 female (34.6%) and 119 (65.4%) male responses. For the residents, there were 39 female responses (37.5%) and 65 male responses (62.5%). For the faculty, there were 24 female responses (30.8%) and 54 male responses (69.2%).

Significant differences between females and males overall were found across four traits (4/28; 14.3%) within the personality assessment scales (Fig. 1). In terms of baseline tendencies, there were no differences noted between females and males. With respect to tendencies that emerge under stress, a small gender difference was noted with males scoring higher on the mischievous ($d = 0.42$) and imaginative ($d = 0.44$) traits. When comparing values, females scored higher on altruism by a small difference ($d = 0.44$), while males were higher in commercial by a small difference ($d = 0.41$).

Subset analysis was done to examine differences between female and male residents and female and male faculty (Figs. 2 and 3). Significant differences between female and male residents were found across two traits (2/28; 7.1%). In terms of the baseline characteristics and stress tendencies of residents, there were no differences noted between females and males in either group. Regarding drivers, male residents valued commercial more than female residents by a moderate difference ($d = 0.50$); female residents valued altruism more than male residents by a moderate difference ($d = 0.53$). Significant differences between female and male faculty were found across one trait (1/28; 3.6%) within the stress tendencies. Male faculty scored higher in the imaginative category by a moderate difference ($d = 0.60$).

When examining the seven total traits that exhibited statistically significant differences between any of the groups (7/84; 8.3%), there were small differences in mischievous, imaginative, altruistic, and commercial when comparing females and males overall; two domains – altruistic, and commercial – in which there were moderate differences between female and male residents; and one domain – imaginative – in which there were moderate differences between female and male faculty. In summary, regarding the traits that exhibited statistical differences, four were small (4/7; 57.1%) and three were moderate (3/7; 42.9%).

Discussion

There has been increasing recognition within the medical education community that both cognitive (e.g. intellectual abilities) and noncognitive (e.g. personality) factors contribute to academic and professional performance.[12] As such, it is important to consider distinctions between females and males and be aware of how these differences may impact development needs. This study investigated variances among female and male otolaryngology residents and faculty at nine academic training programs via the Hogan personality assessments. Importantly, statistically significant differences between females and males overall were present in only four (mischievous, imaginative, altruistic, and commercial) of twenty-eight (14.3%) personality domains. Furthermore, during subset analysis statistical differences were only found in 2/28 (7.1%; altruistic and commercial) traits between female and male residents and 1/28 (3.6%; imaginative) between female and male

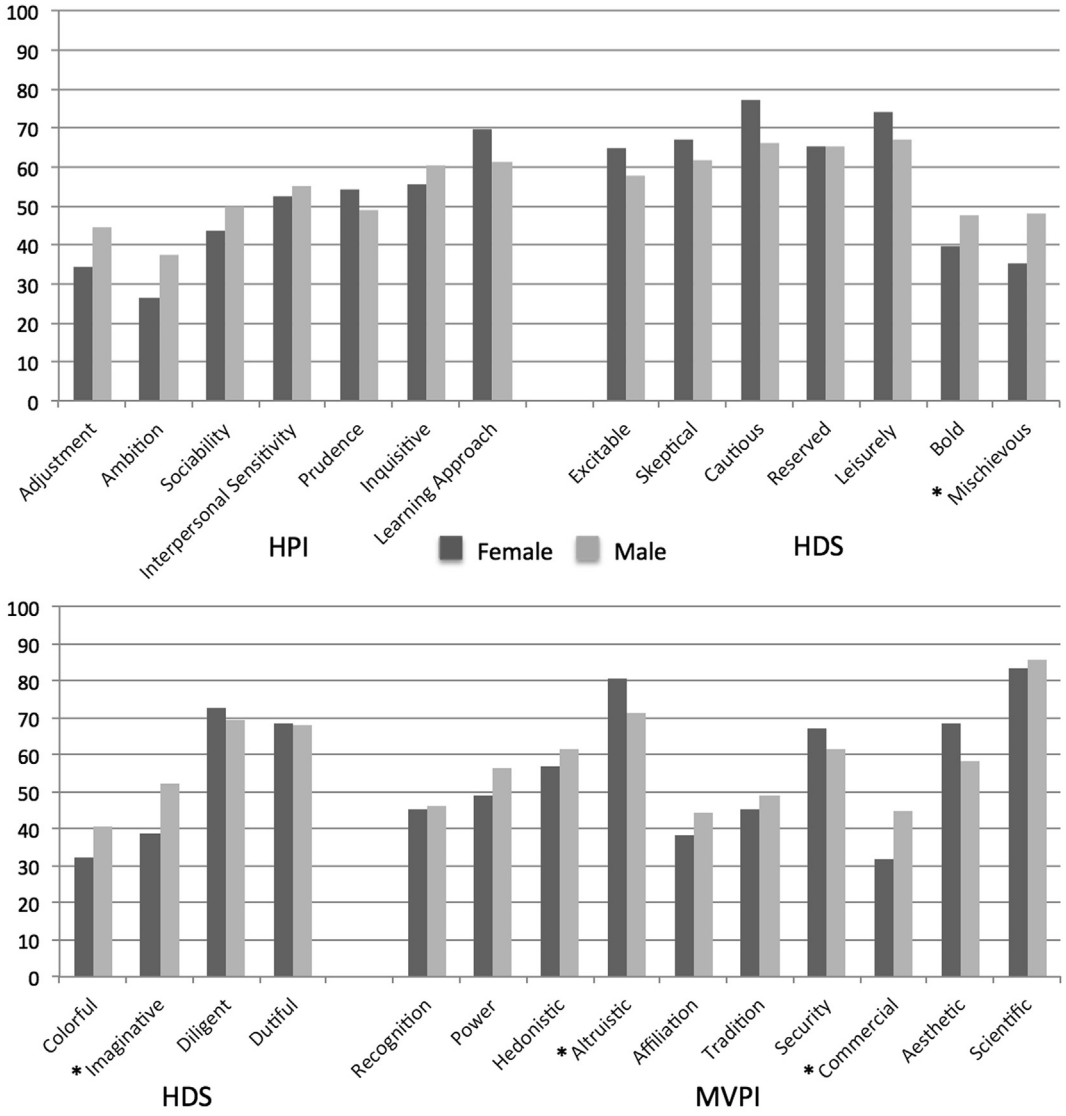

Fig. 1. Female and male results on the three personality assessment scales. Statistically significant differences ($p < 0.0167$) are indicated with an *. HPI = Hogan Personality Inventory, HDS = Hogan Development Survey, MVPI = Motivations, Values, Preferences Inventory.

faculty. These findings suggest that the distribution of responses is similar when comparing female and male otolaryngologists.

More frequently, we found significant gender differences in stress tendencies, which can be thought of as strengths that are generally present but become counterproductive when overleveraged in demanding situations. Males scored higher on the traits of mischievous and imaginative. The former is associated with being charming and interesting. However, in times of duress, mischievous is associated with risk-taking and impulsivity. As the name implies, imaginative is associated with innovation and creativity, yet under stress may present with a lack of focus and impractical solutions. In respect to values, males scored higher on commercial, which suggests money may be a stronger motivator for males than females. In contrast, females scored higher on altruism, which is associated with helping others and a service mentality. Similar gender differences were identified amongst the resident and faculty comparisons. As a whole, these findings are consistent with pervasive stereotypes that associate men with thinking and women with feeling, as well as differentiation along the agentic versus communal continuum, respectively.[2,3]

However, it is important to note that, while significant differences between genders were found, twenty-eight personality scales were evaluated for each of the three pairings and statistically significant differences were only identified across seven traits (7/84; 8.3%). This is in contrast to popular culture philosophy that typically argues that males and females are vastly different psychologically.[6] Recall the worldwide best seller, Men are from Mars, Women are from Venus, which sold over 30 million copies in 40 languages.[13] While studies exist that demonstrate some of these differences, the gender similarities hypothesis is gaining support and posits that females and males are similar in most psychometric indices.[3–6] Furthermore, when differences are noted, they are frequently in the close-to-zero or small range.[6] In her meta-analysis in support of the gender similarities hypothesis, Hyde found that 78% of gender differences were in this close-to-zero or small range.[6] This result was similar to that of Hyde and Plant, who found that 60% of effect sizes for gender differences were in the close-to-zero or small range.[5] The results of our study are also similar, showing that 57.1% of differences were in the small range.

When gender differences are found in these small ranges, the

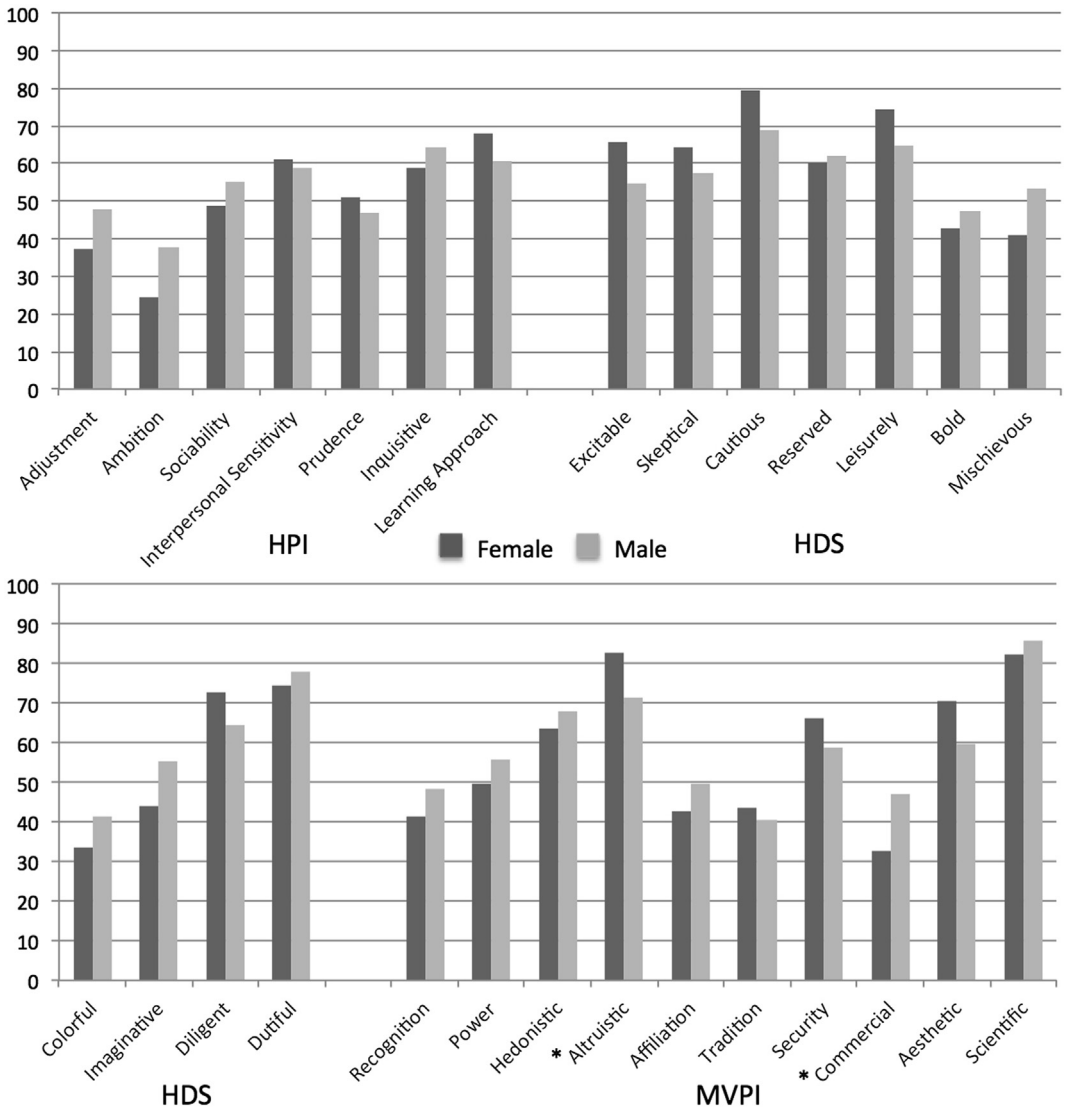

Fig. 2. Female and male resident results on the three personality assessment scales. Statistically significant differences ($p < 0.0167$) are indicated with an *. HPI = Hogan Personality Inventory, HDS = Hogan Development Survey, MVPI = Motivations, Values, Preferences Inventory.

distributions of responses for females and males are largely overlapping. For instance, when the difference is considered small, 85% of the areas of distribution overlap.[7] As a result, gender differences are actually subtle compared with the broad range of individual differences found within each gender. To illustrate this point, we have provided a visualization of a Cohen's d effect size of 0.6, which represents the personality trait in our study with the largest gender difference (i.e. imaginative for faculty).[14] (Fig. 4) Even at this moderate effect size, 76.4% of the group distributions will overlap.[14] Given that this represents the largest gender difference in our study, all other traits that were statistically different would show even greater overlap between the female and male distributions.

Thus, while we found a few significant differences between the average personalities of females and males, we have also shown evidence that there is substantial overlap in personality traits between genders. As a result, the greatest benefit of participating in personality assessment is truly at the level of the individual. The field of Personality and Social Psychology seeks to advance the progress of theory, basic and applied research, and practice in the field of personality and social psychology. It is one of the fifteen recognized specialties in professional psychology and is represented by Division 8 of the American Psychological Association. One of the core ideas in personality psychology pertains to personality traits, ways that we are consistent with ourselves across our lifespan and are reliably different from others. Individual difference theories propose that the variability in personality traits is one of the core ways that human uniqueness is expressed.[15,16] Dr. Tomas Chamorro-Premuzic, Professor of Business Psychology at the University College London and Columbia University, has been a strong advocate for cognitive diversity, encouraging a focus on psychological individual differences, as opposed to demographic group differences.[17] By examining demographic variables, we inadvertently may "perpetuate stereotypical and prejudiced group characterizations which harm individuals and neglect their potential."[17] Such biases may also compound known existing issues including microaggressions and stereotype threat. In contrast, there is growing support within the healthcare community that personalized, data-driven, self-reflection can enhance leader performance across all levels of healthcare communications.[18] Therefore, rather than trying to delineate differences between females and males and how these differences may impact development needs, our efforts should instead focus on understanding what

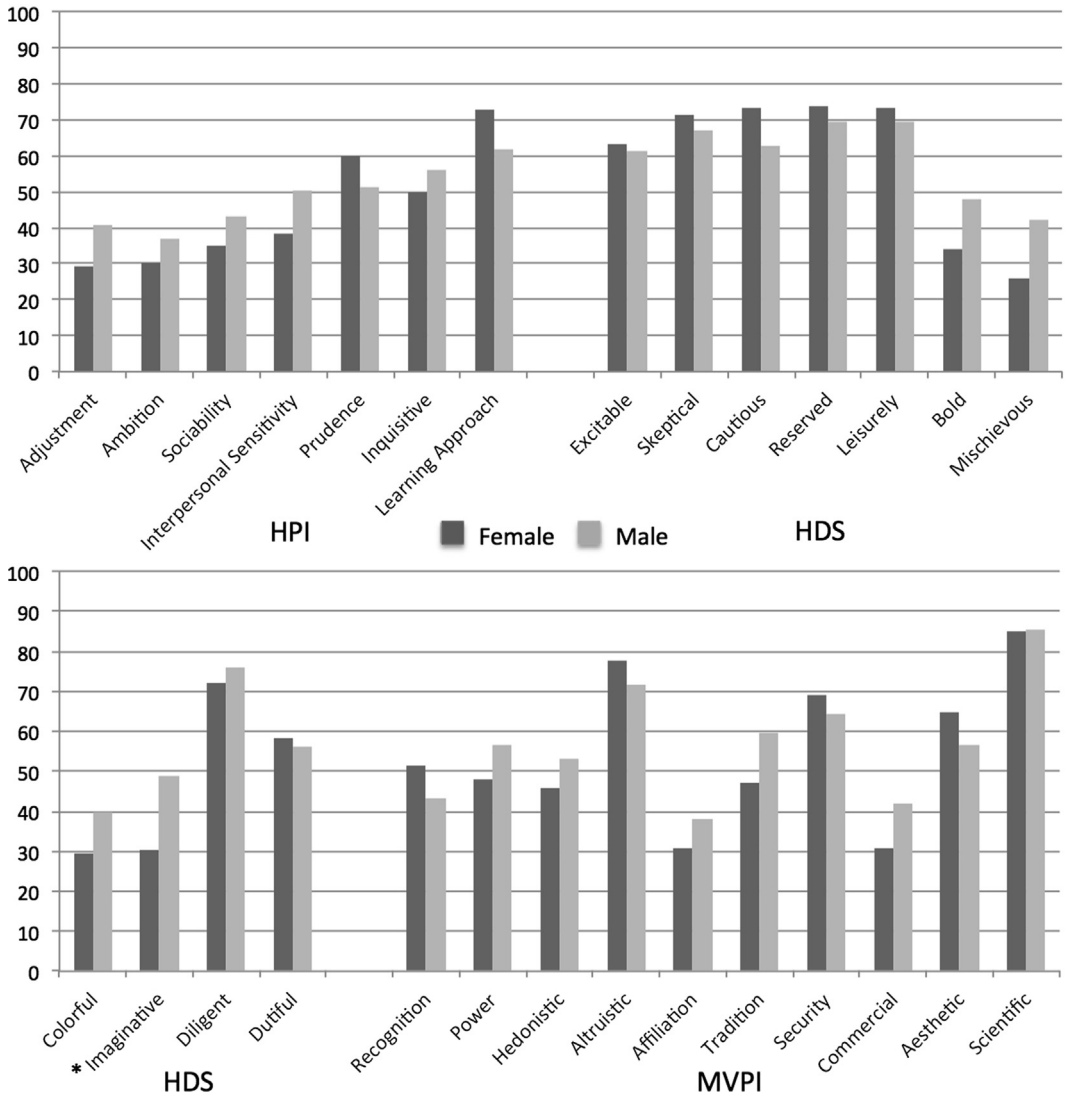

Fig. 3. Female and male faculty results on the three personality assessment scales. Statistically significant differences ($p < 0.0167$) are indicated with an *. HPI = Hogan Personality Inventory, HDS = Hogan Development Survey, MVPI = Motivations, Values, Preferences Inventory.

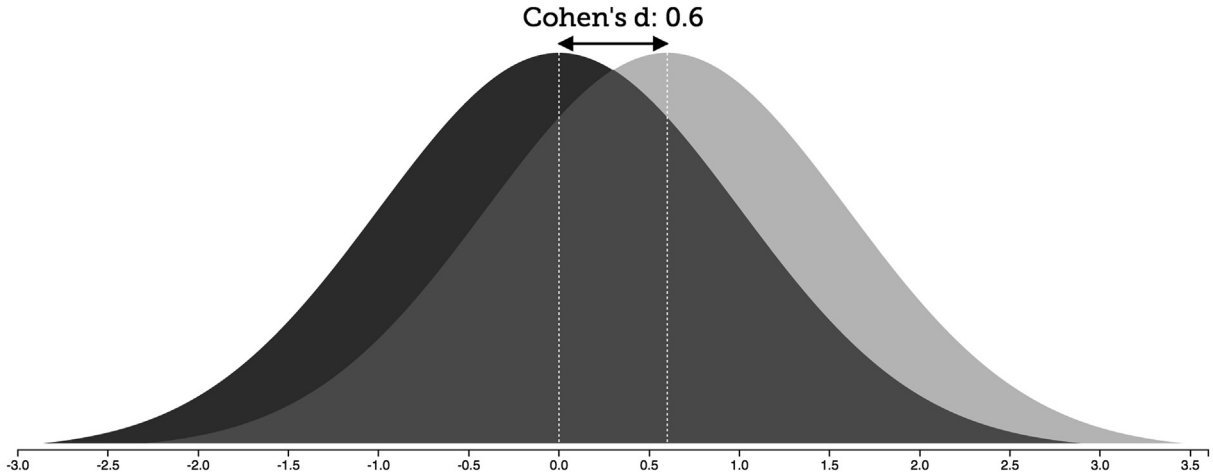

Fig. 4. Visualization of a Cohen's d effect size of 0.6, which is representative of the male and female distributions from our sample for the trait that showed the largest gender difference, imaginative for faculty. At this moderate effect size, 76.42% of the group distributions will overlap.

makes each individual unique and how that can be leveraged for career success.

This study is not without limitations. First, this pilot study was a convenience sample consisting of only nine programs. However, given that the programs varied in size and geographic location, as well as the reasonably high number of participants (i.e., 78 faculty and 104 residents), we believe that our sample is representative of many programs and this helps to improve generalizability. Additionally, the overall gender distribution is similar to prior reports of gender diversity in academic otolaryngology, with approximately 34.7% of otolaryngology residents and 31.5% of faculty being female.[19] All data were voluntarily provided via self-report, which introduces a risk for both selection and response bias. Selection bias is introduced if only subjects with a preexisting interest in and appreciation for personality took the assessments. Response bias would include social desirability, that is, the desire to provide answers that show "good" personality traits such as interpersonal sensitivity. This is less likely given that prior studies have shown that, even when subjects may be motivated to manipulate their responses, their assessment results do not change significantly.[20] In addition, these results were not evaluative but exploratory. It was made clear that the sole purpose of completing the assessments was for professional development, which should reduce social desirability. It is also important to highlight that these findings indicate differences in how females and males perceive themselves. However, personality traits reflect an individual's innate internal environment and do not guarantee a behavioral output. They also do not necessarily reflect how others perceive them. Only attending physicians who serve as faculty were eligible to participate. As such, attending physician data may not be generalizable to the nonacademic practicing surgeon population. Finally, our sample was cross-sectional rather than longitudinal. Variation in results between gender differences in residents and faculty may not accurately reflect the trajectories of personality change over time, but might instead be due to generational differences as has been shown previously.[10]

Conclusion

There is a burgeoning interest in personality and how it contributes to performance. While gender differences exist in both otolaryngology resident and faculty populations, they are small. Overall, females and males in otolaryngology exhibit significant overlap in personality traits. Personality-based initiatives should focus on the individual, rather than perceived gender "norms." Furthermore, personality traits must be situated within the context of the environment in order to understand behavioral output and ultimately how this relates to broader goals within medicine, such as improved patient care and reduced provider burnout.

Financial disclosure information

None;

Meeting information

None.

Disclosures

The views expressed herein are those of the authors and do not reflect the official policy or position of Brooke Army Medical Center, the US Army Medical Department, the US Army Office of the Surgeon General, the Department of the Army, the Department of Defense, or the US government.

Declaration of competing interest

Dr. Sarah Bowe is currently a member of the physician advisory board for J3Personica (Princeton, NJ). J3Personica did not have any involvement in the design, conduct, analysis, or interpretation of the research.

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