

Determining Personal Talents and Behavioral Styles of Applicants to Surgical Training: A New Look at an Old Problem, Part II

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BACKGROUND: The selection of applicants for training in any particular surgical program is an imprecise exercise. Despite the abundance of information on particular candidates, many of the fundamental qualities that are associated with success for the surgical trainee cannot be identified by review of the applicants' grades, scores, letters of recommendation, personal statement, or even from the interview process. We sought a method to determine behavior, motivation, and values possessed by applicants that coincided with traits by our current residents who had demonstrated success in our program.

METHODS: The methods have been described in detail in Part I.¹ Briefly, the individual applicants' personal talent report was used to develop a rank-ordered list by the outside consultant and was compared to the traditionally developed rank list developed by the Department in the traditional fashion and the newly developed job benchmark.

RESULTS: Five hundred thirty-five applications were received and interviews were offered to 112 (21%) applicants. Seventy-five on-line surveys were completed by the 77 applicants who were interviewed. The consultant was able to identify important personal talents, elements of motivation, and behavioral style that were not gleaned from the application or the interview process, some of which prompted a revision of our final ranking order.¹ This report discusses the results of the motivational analysis and of the Personal Talents Skills Inventory. Applicants with a strong motivation for the theoretical (knowledge) and social commitment (desire to help others) are important characteristics. Clear views of the external world and of self, as well as a sense of satisfaction with the applicants' vision of their future are positively associated with success in our program.

CONCLUSIONS: The ability to identify unique behavioral, motivational and personal talents that applicants bring to the program that were not identifiable from the traditional

application and interview process has allowed us to determine applicants who were a good match for the structure and culture of our program. (J Surg 69:23-29. © 2012 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: resident selection, behavioral profile, motivational profile, DISC analysis, personnel selection, personal assessment, personal talent report, applicant interviews, TriMetrix

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

INTRODUCTION

Finding ideal candidates for surgical training who are good matches for a particular program is challenging. Over the years it has become apparent that the traditional process of selecting residents and developing a match list can be fraught with error resulting in the appointment of trainees who struggle with a particular curriculum or training culture. Success as a medical student does not necessarily extrapolate to success as a surgical resident as the demands of surgical training are different from those of an undergraduate. The traits necessary for success during postgraduate training are often difficult to discern from the review of an application or even during the interview process.

Our Department searched for a method that would identify the individual characteristics of candidates who would have the best chance for success in our program. These included an analysis of the applicants' dominant behavioral styles, their intrinsic motivators, and an inventory of the personal talents they bring to the program. The assessment of individual behavioral styles has been previously discussed and compared with the job benchmark that was established for our particular program.¹ This discussion focuses on the second and third components of the TriMetrix (Target Training International, Ltd; TTI) assessment of candidates for our surgical training program: intrinsic motivation and the personal skills inventory.

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MATERIALS AND METHODS

This study was approved by our Institutional Review Board. The details of the methods utilized have been previously described.¹ Briefly, the Department employed the services of an outside consultant to administer the TriMetrix assessment tool (Target Training International, Inc, Phoenix, AZ) to applicants who were selected for an interview for a position in our program. Completion of the survey was voluntary. This survey allowed the consultants to provide an assessment of behavioral style, motivation, and an inventory of personal skills. The analysis was performed independently of the Department's rank list developed based on the traditional criteria, ie, grades, United States Medical Licensing Examination performance, letters of recommendation, extramural activities, class standing, and information and impressions gleaned from the interviews. The rank list of the consultant was based on how well the candidates matched the job benchmark established from an analysis of our current residents and a consensus of the traits necessary for success developed by those within our Department who were considered subject matter experts (SMEs) in the area, as previously described.¹ These subject matter experts included faculty, successful senior level residents, and others who had daily contact with the residents, ie, nurses and ancillary personnel.

Workplace Motivators

The assessment of intrinsic/workplace motivators included 6 values; theoretical, utilitarian, aesthetic, social, individualistic, and traditional. This is based on the work of Eduard Spranger published originally in 1914.² The assessment tool consists of 16 categories with 6 items in each category that applicants are asked to rank in order from what they value most to least. The workplace motivators' assessment was compared with 43,325 assessments from the database of TTI. Examples of categories include favorite subjects, leisure activities, personal motivators, and career goals to mention a few. A computer-based analysis provided a graphic representation of the degree to which the candidates fall into the 6 motivational categories listed above.

Personal Talent Skills Inventory

The third component of the TriMetrix (TTI) assessment consists of 2 parts and is based on the Hartman Value Profile.³ The 2 sets of questions provide an analysis of how clearly the individual views both their external world and internal world. The first set of questions provides a list of 18 items or statements that the candidate is asked to rank in order from good to bad. A proprietary computer analysis of answers to this set provides a graphic representation of how the individual views the external world with respect to people (empathy), things (practical thinking), and ideas (systems judgment). A second analysis provides a representation of how the candidate views themselves with respect to people (sense of self), things (role awareness), and ideas (self-direction). We refer to these graphic representations as a snapshot of an individual's "Dimensional Balance." In ad-

dition, the Personal Skills Inventory assesses 23 personal talents or attributes of the candidate compared with a population reference group derived from the TTI database of over 40,000 assessments.

We re-emphasize that the TriMetrix (TTI) assessment is not a personality inventory and does not imply good or bad, or right or wrong. The assessment only provides a representation of an individual's behavioral style, the things that motivate him to do the job, how he sees the world and himself at this moment in time and a comparison of his soft skills or natural talents to a population mean. This analysis provides information about the candidate that is not easily identified during an interview and cannot be abstracted from the usual application process. Our consultant independently developed a rank list based on the TriMetrix (TTI) results as compared with the job benchmark specifically developed for our program. The consultant's results were thus based on how well an applicant matched the culture of our program, independent of grades, scores, letters of recommendation, etc. This assessment accounted for no more than 33% of our total selection criteria.

RESULTS

One hundred twelve candidates were offered interviews from 535 applications (21%). Seventy-seven interviews were conducted (68% of offers) and 75 TriMetrix (TTI) assessments were completed. Comparison of the rank list by the Department with the list developed by the consultant, while showing general agreement with applicants in each quartile of the rank lists, demonstrated notable differences in some cases. The consultant was able to discern personal traits and characteristics that did or did not appear to be a good fit for the structure and culture of our program originally not recognized through resumes and interviews. Contrarily, some applicants who were considered a good match by the consultant had their application re-evaluated and in some cases were elevated on our rank list. The specific of how the lists were compared is reported in Part I.¹

Intrinsic Motivators

Figure 1 is illustrative of an applicant's motivational assessment. The workplace motivators' assessment suggests "why" a person does what they do. This candidate is motivated by activities that stimulate his theoretical (THE) and social (SOC) values. The theoretical motivator is the desire for knowledge. This candidate could be viewed as one who learns for the sake of learning. The dominant interest of individuals with high theoretical scores is the discovery of truth. These individuals are generally empirical, critical, and rational.

The social motivator is the desire to help others. Those with high social scores are generally kind, sympathetic, and unselfish. This applicant is passionate toward helping others, particularly those who cannot help themselves. The applicant's individualistic motivator (IND) is his desire to lead, and be in charge falls just above the national average. High scores in this area are

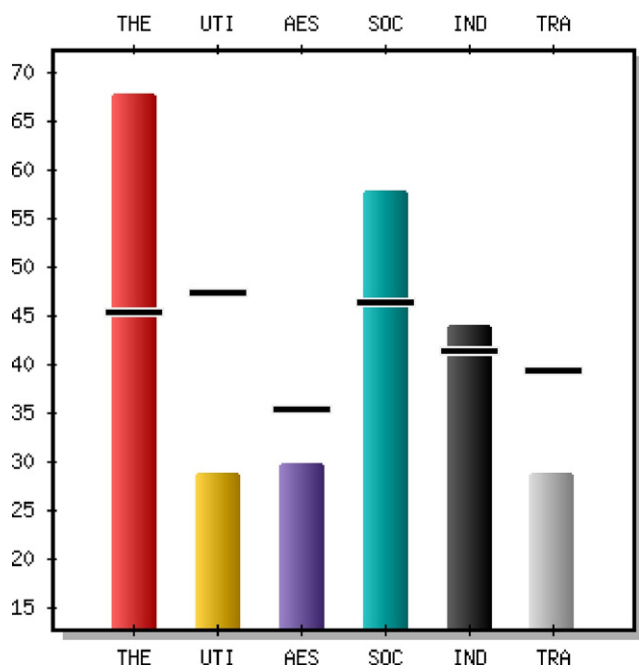


FIGURE 1. Graphic representation of an individual's intrinsic motivators. Each of the six motivators is scored on a scale of 0-70 with the black hash illustrating the national average (mainstream) for each. The individual is passionate about activities that satisfy her theoretical and social motivators and she will be energized by these activities. Conversely, this individual will be indifferent toward utilitarian, aesthetic and traditional motivators. The individualistic/political motivator is main stream and will motivate this person situationally.

generally found in people with a high power value and a desire for influence and renown. Finally, this candidate is indifferent toward the utilitarian (UTI) motivator (the desire for return on investment of his time, talent, and resources), the aesthetic (AES) motivator (the desire for balance and harmony in the world), and traditional (TRA) values (the desire for a closed system for living). When a candidate's intrinsic motivators match those identified for success in a particular job, the chances increase for a candidate to achieve success, in our case as a surgical resident.

Dimensional Balance

Figure 2 is a graphic representation of an applicant's Dimensional Balance as a real-time categorization of applicant's views of the world and himself at this particular moment in time. It assesses the candidate from 2 perspectives; how the individual views the world (external view—Graph 1) and how the individual views themselves (internal view—Graph 2).

Graph 1 reflects the person's view of the external world with respect to his empathetic outlook, practical thinking, and systems judgment. Empathetic outlook is the external intrinsic dimension and is all about people, acknowledging others as unique individuals, and reflects how the applicant may view others. Practical thinking is the external extrinsic dimension and is reflective of how an individual feels about things. This dimension reveals the person's grasp of things, causal relations,

and how things fit together. Systems judgment is the external systemic dimension and defines how the applicant feels about the systems of the external world, ie, rules, laws, regulations, policy, and procedures.

Graph 2 of Figure 2 is reflective of the individual's internal view of himself with respect to his sense of self, role awareness, and self-direction. It can be regarded as an appraisal of where the individual sees himself at this particular point in his life. Sense of self is the internal intrinsic dimension and refers to how the candidate sees and values himself. This dimension involves emotional control and a sense of harmony with self. Role awareness is the internal extrinsic dimension and is reflective of how the person feels about their current roles in their life. This dimension takes into account all of a person's roles that provide significant meaning in their life, personal and public. Self-direction is the internal systemic dimension and provides an assessment of how the person feels about his future. This dimension defines whether a person knows where he is going and what kind of future he is going to have.

Part 1, External Factors reflects the applicant's view of his external world. This candidate is above the population mean for clarity in all 3 areas, indicated by the star on the left of the bar. His external world is anchored by his empathy, or how clearly he understands and feels about others as indicated by this score being the highest of the 3 dimensions. This candidate would accurately evaluate and value people and his role in the workplace, but would not look for relationships outside the job as indicated by the down arrow in this dimension. With respect to the practical thinking dimension, the candidate clearly understands cause and effect, but the down arrow suggests a personal and emotional detachment. This may indicate a person who is able to identify deficiencies, but may interpret the problem as status quo therefore avoiding initiatives to resolve the problem. The candidate's evaluation of world systems is main stream. The positive arrow indicates that the person has respect for authority, laws, policies, and procedures.

Part 2, Internal Factors, suggests the candidate has a strong sense of self as indicated by the 9.4 clarity score, the highest of the 3 internal factors. The candidate has high self-esteem and is happy and content with whom he is. He is also very clear about his future as indicated by the high clarity score of 8.8 in the self-direction dimension. In addition the up arrow indicates the candidate is very positive about his future. The candidate's role awareness is lowest of the 3 dimensions, suggesting that the individual is not as clear about his current role. The down arrow suggests that the current role is not as fulfilling personally as it might be. This assessment reflects only a real-time view of how the individual thinks about himself at this particular point in his life, and as such, may change over time.

Personal Skills Hierarchy

Derived from the Personal Talents Skill Inventory (PTSI), the assessment reflects what an individual "can do" in 23 capacities or the personal talents he brings to the job; Figure 3. Each

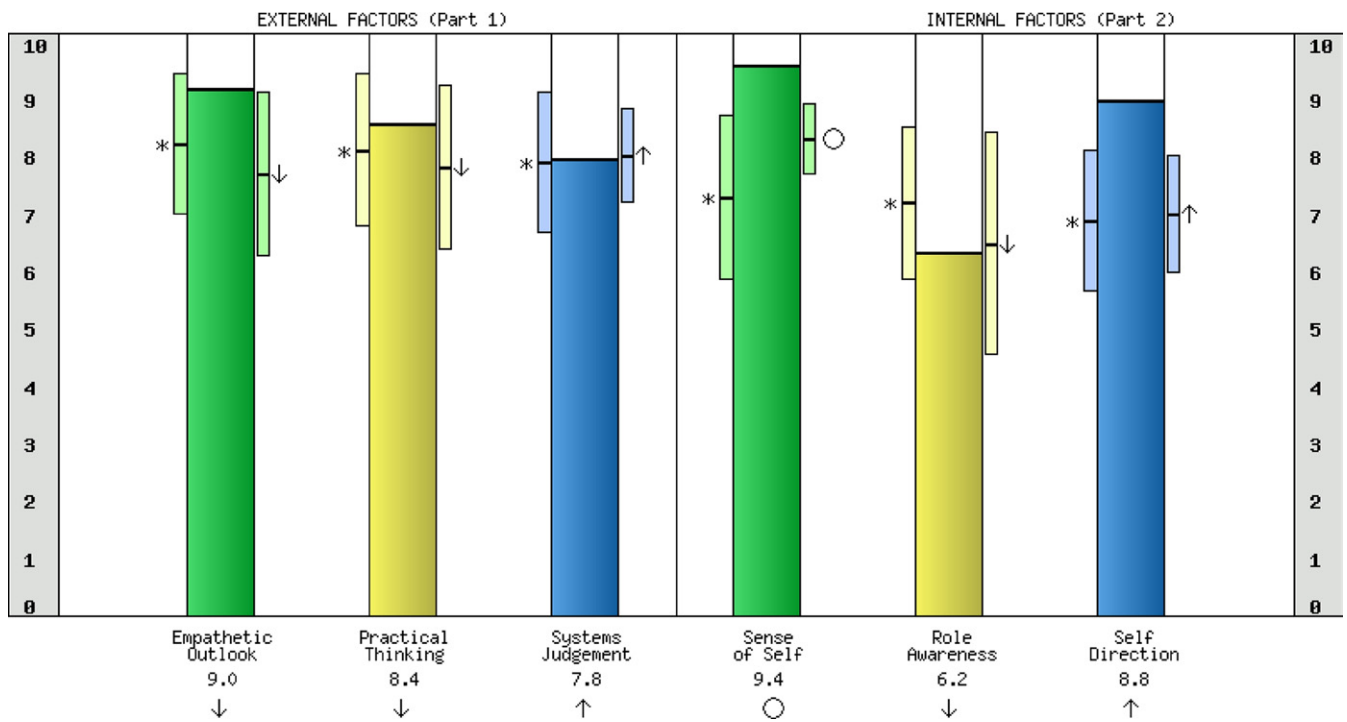


FIGURE 2. This is graphic representation of a candidate's Dimensional Balance Assessment. Each of the six dimensions is scored from 0-10 and represents how clearly an individual views each dimension. The arrows indicate this person's emotional bias toward each dimension. An up arrow represents a positive bias, a tendency to over value the positive elements of that dimension. A down arrow represents a negative bias, or the tendency to undervalue the elements of the dimension. The circle represents a neutral bias, or overall balance of the elements of the dimension. This assessment reflects only a snapshot of how the individual thinks about themselves at this particular point in their life, and as such, may change over time.

attribute is based on a scale of 0 to 10. The national average is represented by the black hash and the gray area represents 1 standard deviation, or 68% of the population. This analysis is helpful in comparing a candidate to those residents who have achieved success in our program. The analysis also indicates areas where a faculty mentor may take advantage of the opportunity to coach a surgical trainee.

DISCUSSION

Surgical educators are looking for the best and brightest of applicants and for those who have the capabilities of being successful in a particular program. As a generalization, applicants for surgical training have the inherent cognitive skills necessary as evidenced by their undergraduate performance, ie, grades and performance on the United States Medical Licensing Examination. Therefore, it is relatively easy to rank applicants based on these parameters understanding that grading scales vary widely among medical schools and that the scores may also reflect the individual effort expended by candidates during their undergraduate education. The surgical educator is tasked with not only fostering the acquisition of the psychomotor skills necessary for the development of a competent technical surgeon, but with facilitating the development of appropriate surgical thought and decision-making. Medical knowledge and patient care are only 2 of the 6 competencies requiring mastery by the surgical trainee. Each program varies in how its

curriculum is structured to assist in the development of professionalism, practice-based learning and improvement, interpersonal and communication skills, and systems-based practice. Thus, it can be said that each program has its own unique culture. The identification of a candidate who is a good fit for that particular culture is frequently problematic. Individuals who are not successful in meeting the expectations of a program or who struggle achieving competency in any of the 6 areas, rarely fail because of the lack of inherent talent or cognitive prowess. Attrition is disruptive and expensive for a program, and devastating for the trainee. The cost per individual TriMetrix® assessment of \$250 compared to the yearly cost of supporting a resident (approximately \$125, 000 to \$130, 000) appears justified. Finding a way to assure that a candidate is a good fit is beneficial for both the program and the candidate.

Many of the soft skills necessary for success are difficult to extract from an application or a brief interview. Personal discussions with faculty members from the candidate's medical school are frequently helpful, but not necessarily sufficient to gain an understanding of a candidate's natural and adaptive behavior, his primary motivation for becoming a surgeon, or how he views himself and the world in which he functions. The personal statement can shed some insight, but is not a good indicator of what the applicant values. Merlo and Matveevskii⁴ suggest that personality traits are associated with success in anesthesiology training and are the best predictors of success in clinical performance. We reiterate that the TriMetrix (TTI)



PERSONAL SKILLS HIERARCHY

Your unique hierarchy of personal skills is key to your success. Knowing what they are is essential to reaching your goals. The graphs below rank your personal skills from top to bottom.



* 68% of the population falls within the shaded area.

FIGURE 3. The Personal Skills Hierarchy is an inventory of talents that an individual brings to the position for which they are applying compared to results from the normal population. This candidate's highest soft skill is his ability to take responsibility for his own education, an important skill in postgraduate training. Scores that fall below the mean are areas with potential coaching opportunities for faculty mentors. The hash mark indicates the mean score of the average population and the shaded area is the standard deviation.

evaluation is not a personality inventory, but agree with Merlo and Matveevskii that there are additional talents and traits that contribute to success in postgraduate surgical training and in subsequent clinical performance. The call for new assessment tools to assess professionalism is an effort to explore deeper into the behaviors and motivators of today's trainees.⁵

Our efforts to identify information regarding the personal talents of applicants to our program and provide additional information that might predict success in our program resulted in the application of a system developed by TTI, the TriMetrix evaluation. This voluntary assessment was administered by an outside consulting firm and employed a proprietary computer-based analysis of the candidates' responses to a series of questions and statements which was then compared with an extensive national database. This process has been validated in business, nursing, and engineering schools.⁶⁻⁸

Eduard Spranger (1882-1963) was a German philosopher and psychologist who, in his monograph,² described 6 basic types of individuals. Spranger did not imply that each individual was purely 1 type, but a combination of all 6 to some degree. Invariably, however 1 characteristic tends to dominate the motivational fabric of an individual. The theoretical type aspires to the general ethics of legality, the value of objectivity, observation, and reason. Frequently these individuals are scientists or philosophers. Knowledge for the sake of knowledge is an underlying value. The utilitarian, or economic, individual embraces the practical world and wants education to have application, usually in the form of a return on investment, ie, monetary or some other form of reward. For him unapplied knowledge has little value. This often results in potential conflict with other values, such as the theoretical, the esthetic, and the traditional. The aesthetic person relates to beauty, balance, form, and harmony, judging life from the viewpoint of symmetry and grace. The beauty of the gonfalon of power and pomp is more appealing itself than the ideals that it may represent. Individualism and self-sufficiency are key attributes for these persons. This value system frequently is in conflict with the theoretical. The highest value for the social individual is the love of people, and characterizes one who views others as ends in and of themselves. The social person is likely to be in conflict with the individualistic type and may regard the theoretical, esthetic, and utilitarian as cold and inhumane. In the purest form, the social may approach the traditionalist attitude. The individualist, or political person, is primarily motivated by power, influence, and self recognition. Many philosophers describe this motivation as the most fundamental of all because competition and struggle are elements of almost all aspects of life. The traditionalist aspires for structure and to live by a defined set of rules or code. These persons are frequently devoutly religious. The applicant example shown (Fig. 1) matches most successful residents in our program, high theoretical and social values indicating a desire for knowledge and helping others, particularly those who are vulnerable or cannot help themselves.

The Hartman value profile (HVP)³ has its foundation in formal axiology. Axiology is a science of not only what an indi-

vidual values, but the individual's capacity to value and the process of valuation itself. The HVP is a complex mathematical model⁹ of value and moral phenomena that calculates the concurrence, or deviation, of an individual's ranking of 18 items in the order of best to worst. The reference list is derived a priori from the axiological theory developed by Hartman and has been validated extensively, most recently by Pomeroy.¹⁰ Axiological science has brought the ability to quantitate the capacity to value the heretofore subjective and intangible values, morals, and ethics, subjects in such prominence in medical education today. The HVP measures the individual's capacity to value in 3 dimensions, the intrinsic, the extrinsic, and the systemic. The intrinsic system refers to things that have value in and of itself, valued for their own sake, eg, life, self, others, family, health, etc. The extrinsic system concerns tangible things, possessions, actions, or roles. The systemic dimension concerns conceptual constructs or ideas about things. Hartman proposed that the intrinsic dimension is at the top of the hierarchy while the systemic dimension is at the bottom, with the extrinsic dimension in the middle. Stated another way, life and the view of one's self should be valued to a greater degree than things. Thoughts or ideas about things or people should be valued the least. Many psychologists believe that most human moral failings arise when things are valued above people. The analysis provided by the TriMetrix (TTI) system provides a snapshot of how a candidate currently views their place in the world and of themselves at the time the survey was completed. As a person's life experience changes and as he matures, in the case of an applicant's transition from medical student to resident and subsequently to an independent medical or surgical practitioner, the results of the evaluation can be expected to change. Considering the example candidate shown in Figure 2, the candidate may be currently dissatisfied, or confused, with his role as a "student," but satisfied and excited about his future as a surgical trainee or a practicing surgeon.

Pomeroy¹¹ has also demonstrated axiological correlation between the HVP and several of the standard admissions tests widely used for admission to medical school. This pilot study, through multivariate discriminant analysis of split halves, demonstrated good correlation between the HVP and interview scores by those experienced in the interview process (85.5% correct classification, $p < 0.021$), Medical College Admission Test-Biology scores (81.8% correct classification, despite a $p = 0.339$), Medical College Admission Test-Combined scores (89.1% correct classification, $p < 0.05$) and medical student grades, the highest (90.9% correct classification, $p < 0.05$). The small number of subjects in this pilot study ($n = 55$) calls for larger confirmatory studies to find correlates with other standard admission criteria.

The Outcome Project of the Accreditation Council for Graduate Medical Education stresses the importance of facilitating the development of professionalism in graduate medical trainees as 1 of the essential competencies. Professionalism includes respect, compassion, integrity, ethical conduct, accountability, and sensitivity to culture, age, gender, and dis-

abilities.^{12,13} The Personal Talents Skills Inventory provides information concerning the attributes a candidate brings to the program and as such can be used as a template for coaching and feedback. The candidates' view of the external dimension, particularly with respect to people and process, provides important information regarding a "baseline" from which coaching can begin in this competency.

The TriMetrix (TTI) methodology has proven uniquely accurate in predicting success for engineering students⁸ and hopefully, additional experience with this tool will prove equally as useful for selecting surgical trainees for the culture of our program. Further, the tool has the potential for assisting in the mentoring of individual residents.

SUMMARY

We have employed a mathematical model of axiological science to assist in the identification of desirable applicants to our surgical training program in addition to the standard criteria normally used to rank our candidates for our program. The results of the assessment are only a part of the decision-making process, but it has proven to be a potentially useful adjunct to the methodology we have traditionally used. It has provided insight into the behavioral characteristics of the applicants and what motivates them to excel and commit to the process of developing the cognitive and psychomotor skills necessary for competent surgical practitioners. Much of what this assessment provides has not been gleaned, historically, from the formal application or the interview process. It is expected that as our experience with this tool grows, more helpful insights will be forthcoming. The information derived from this evaluation has provided an opportunity to improve communication with our current residents and provide constructive feedback in ways that are potentially more effective.

DISCLOSURES

Drs. Bell, Fann, and Morrison report they have nothing to disclose. Mr. Lisk is a partner with Lisk Associates, Lexington, Kentucky. Lisk Associates is the consulting firm used for the TriMetrix® evaluations.

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