



Dissecting a department of surgery: Exploring organizational culture and competency expectations



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ARTICLE INFO

Article history:

Received 15 June 2020

Received in revised form

24 August 2020

Accepted 4 October 2020

ABSTRACT

Introduction: In order to recruit high-potential trainees, surgery residency and fellowship programs must first understand what competencies and attributes are required for success in their respective programs. This study performed a systematic analysis to define organizational culture and competency expectations across training programs within one academic surgery department.

Methods: Subject matter experts rated the importance and frequency of 22 competencies and completed a 44-item organizational culture inventory along 1 to 5 Likert-type scales.

Results: Importance and frequency attributions of competencies varied significantly among programs ($p < .05$ by ANOVA), but there was substantial agreement on organizational culture; self-directed ($x = 3.8$), perfectionist ($x = 3.7$) and social ($x = 3.7$) attributes were most representative of the program, while oppositional ($x = 1.8$), competitive ($x = 2.5$) and hierarchical ($x = 2.7$) characteristics were least representative.

Conclusions: Residency and fellowship programs within the same department have shared perceptions of the culture and values of their institution, but seek different competencies among entering trainees.

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Introduction

Organizational culture describes the basic pattern of shared values, assumptions, interpretations, and approaches that characterize a workplace. An organization's culture consists of four key elements: 1) it is a shared experience across all members of the organization, 2) it has visible and less visible elements, 3) it is quickly learned among new members of the organization, and 4) it changes slowly over time.¹ Culture has been colloquially described as "how we do things around here" or the DNA of an organization.² In healthcare, organizational culture has been shown to impact a number of valuable outcomes, including provider attitudes,³ patient satisfaction,⁴ and patient outcomes.⁵ In residency education specifically, culture has been linked to trainee burnout, job satisfaction, perceptions of organizational support, attrition, and

feedback delivery.^{6–8}

Given the array of outcomes associated with organizational culture, measuring its patterns and level of agreement among members can provide useful insights for identifying opportunities for improvement, developing organizational strategies, and exploring the utility of focused interventions. Defining culture can also help organizations better understand the types of individuals who will thrive in their environment so they can maximize person-organization fit (p-o fit). P-O fit describes the extent to which an individual's competencies, values, and preferences are compatible with the organization's core values and offerings^{9,10} and has been lauded as the ultimate competitive advantage for companies given the array of positive outcomes associated with high levels of p-o fit.¹¹ Indeed, the members of organizations with higher p-o fit experience benefits of higher job satisfaction, job performance, and organizational commitment along with decreased turnover.^{9,10,12–14}

Maximizing opportunities for p-o fit may be valuable within the surgical education community as well. Achieving alignment between a trainee's values and desires within a work environment and those available from a training program may be one solution to

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the high rates of burnout and attrition reported among those within some surgical training pathways.^{15,16} However, the value of p-o fit rests on the ability to accurately assess relevant aspects of both the person and culture. Thus, in order to begin to make efforts to increase this alignment, departments must first systematically define their culture and the competencies needed to fit those unique demands.

The goal of this study is to explore organizational culture across the educational units within a department of surgery. Specifically, we examine the extent of shared agreement about organizational culture across educational leaders from different surgical training programs within a department. We also investigate the extent to which each of these unique training programs agree on the competencies required among entering trainees to be successful in their program.

Methods

Data were collected using multi-method, semi-structured interviews with subject matter experts (SMEs) from five programs in a surgery department. The SMEs who participated in the interviews came from a variety of positions, including Chair, Program Director, Associate Program Director, incumbent trainees, and other key stakeholders.

Four industrial organizational psychologists conducted the interviews. During each hour-long interview SMEs completed a quantitative assessment where they rated the importance (1 = not essential/optional, 5 = absolutely essential) and frequency (1 = almost never, 5 = constantly) of 21 competencies (e.g., trustworthiness, resilience) derived from the literature and job descriptions of surgeons and surgical residents^{16,17} using a 5-point Likert-type scale. The product of these two ratings was then used to create an overall criticality rating for each competency. All SMEs were given a definition sheet at the beginning of each interview to ensure that each understood the constructs in the same way.

In addition, the SMEs also completed a 44-item organizational profile inventory adapted from the Organizational Culture Inventory (OCI)¹⁸ The OCI is a 120-item questionnaire that measures 12 cultural styles (i.e., humanistic-helpful, affiliative, approval, conventional, dependent, avoidance, oppositional, power, competitive, competence/perfectionistic, achievement, and self-actualizing) that fall under three dimensions (i.e., constructive, passive-defensive, and aggressive-defensive). Its use is widespread: the OCI has been used in medical,¹⁹ business,^{20,21} and military contexts.²² Cooke and Szumal²³ have found that the interrater reliability for the subscales ranges from 0.66 to 0.82, and the internal consistency of each subscale was also acceptable across four samples. In addition, the scale has been found to demonstrate both construct-related and criterion-related validity.²³ In this study, SMEs indicated how accurately each statement (e.g., “Trainees must be creative to be successful in this program”) described their program on a 5-point Likert scale (1 = Not at all accurate, 5 = Very accurate). These items were then grouped into subscales for analysis.

Multiple analyses of variance (MANOVAs) were conducted using SPSS version 25 to compare the competency criticality ratings and the scores on the culture scale across the five programs. In addition, r_{wg} and the average deviation index (AD) were computed to assess the level of interrater agreement with each program.

Results

A total of 31 SMEs participated in the interviews with 6 interviewed for more than one program. Most of the SMEs ($n = 14$) were associated with the general surgery residency program, while the

others were associated with the vascular residency and fellowship programs ($n = 8$), the surgery critical care fellowship program ($n = 6$), the minimally invasive surgery (MIS) fellowship program ($n = 5$), and the pediatric surgery fellowship program ($n = 4$). The majority of the SMEs were male (65%, $n = 20$) and white (65%, $n = 20$). Faculty tenure ranged from 1 to 28 years, for an average tenure within the department of 11.31.

Across all programs, integrity ($M = 23.88$, $SD = 3.45$), dependability ($M = 23.06$, $SD = 4.63$), communication ($M = 21.86$, $SD = 3.88$), professionalism ($M = 21.75$, $SD = 4.49$) and attention to detail ($M = 20.39$, $SD = 5.15$) had the highest criticality ratings. Conscientiousness ($M = 19.06$, $SD = 5.52$), problem-solving ($M = 18.64$, $SD = 5.38$), feedback receptivity ($M = 18.33$, $SD = 4.55$), time management ($M = 18.28$, $SD = 5.59$), and team orientation ($M = 18.11$, $SD = 5.98$) also had high criticality ratings. The results of a MANOVA showed, however, that there were differences among the programs on competency criticality ($F(40, 77.69) = 1.68$, $p = .03$, Wilk's $\Lambda = 0.09$). Table 1 shows the means, standard deviations, and r_{wg} values for these competencies for each program. As the table shows, post-hoc testing revealed that programs differed in their opinions of the criticality of trust, detail orientation, and team orientation. Trust was considered more critical by the vascular residency and fellowship programs, the general surgery residency program, and the critical care fellowship program than by the MIS fellowship program. The vascular residency and fellowship programs also rated detail orientation more critical than the MIS fellowship program did, and team orientation was more important for the critical care fellowship program, the pediatric surgery fellowship program, and the vascular residency and fellowships programs than it was for the MIS fellowship program.

The 44 organizational culture inventory items were split into twelve subscales for analyses: political (3 items; $r_{wg(j)} = 0.76$; $AD_{m(j)} = 0.80$, $\alpha = 0.79$), hierarchical (3 items; $r_{wg(j)} = 0.68$; $AD_{m(j)} = 0.92$, $\alpha = 0.79$), competitive (3 items; $r_{wg(j)} = 0.63$; $AD_{m(j)} = 0.92$, $\alpha = 0.88$), social support (6 items; $r_{wg(j)} = 0.76$; $AD_{m(j)} = 0.73$, $\alpha = 0.51$), perfectionistic (6 items; $r_{wg(j)} = 0.82$; $AD_{m(j)} = 0.59$, $\alpha = 0.44$), dependence (2 items; $r_{wg(j)} = 0.70$; $AD_{m(j)} = 0.80$, $\alpha = 0.58$), input seeking (4 items; $r_{wg(j)} = 0.69$; $AD_{m(j)} = 0.77$, $\alpha = 0.67$), self-directed learning/initiative (3 items; $r_{wg(j)} = 0.83$; $AD_{m(j)} = 0.69$, $\alpha = 0.64$), conventional (3 items; $r_{wg(j)} = 0.75$; $AD_{m(j)} = 0.85$, $\alpha = 0.74$), self-actualization (6 items; $r_{wg(j)} = 0.79$; $AD_{m(j)} = 0.65$, $\alpha = 0.65$), oppositional (3 items; $r_{wg(j)} = 0.82$; $AD_{m(j)} = 0.69$, $\alpha = 0.61$), and conforming (2 items; $r_{wg(j)} = 0.73$; $AD_{m(j)} = 0.77$, $\alpha = 0.51$). Description of each subscale is provided in Table 2. The results of a MANOVA show that program affiliation did not affect agreement on scales ($F(48, 75.23) = 1.37$, $p = .11$, Wilk's $\Lambda = 0.09$). Fig. 1 shows the mean accuracy ratings across all programs for the 12 dimensions.

Discussion

The goal of this study was to explore the extent to which different surgery training programs within one department of surgery reported similar competency needs among entering trainees and perceptions of organizational culture. These findings revealed that surgical specialty influences the criticality of competencies needed to successfully perform the role of a trainee, suggesting that a “one size fits all” competency assessment for entering trainees would not be ideal for the department. For example, while these data indicate all programs desire a dependable and trustworthy trainee, it would be most worthwhile for the vascular programs to further focus on attention to detail, the MIS program on feedback receptivity, the critical care program on problem solving ability, the pediatric surgery program on conscientiousness, and the general surgery residency on time

Table 1
Competency ratings by specialty.

	General Surgery		Vascular		MIS		Critical Care		Pediatric Surgery	
	Mean (SD)	r _{wg}	Mean (SD)	r _{wg}	Mean (SD)	r _{wg}	Mean (SD)	r _{wg}	Mean (SD)	r _{wg}
Trust	24.18 ^a (2.71)	0.86	25.00 ^a (0.00)	1.00	18.80 ^b (6.87)	0.90	25.00 ^a (0.00)	1.00	25.00 ^{ab} (0.00)	1.00
Dependability	22.45 ^a (4.72)	0.57	25.00 ^a (0.00)	1.00	19.20 ^a (8.01)	0.00	22.83 ^a (5.31)	0.46	25.00 ^a (0.00)	1.00
Communication	20.64 ^a (3.67)	0.74	23.10 ^a (3.25)	0.80	19.80 ^a (6.53)	0.18	23.33 ^a (2.58)	0.87	22.50 ^a (2.89)	0.84
Detail Orientation	18.27 ^{ab} (4.29)	0.65	24.10 ^a (2.85)	0.84	15.20 ^b (7.79)	0.00	21.00 ^{ab} (3.46)	0.77	22.50 ^{ab} (2.89)	0.84
Conscientiousness	17.18 ^a (4.42)	0.62	21.30 ^a (4.16)	0.67	15.80 ^a (7.29)	0.00	19.33 ^a (7.17)	0.01	23.33 ^a (2.89)	0.84
Problem Solving	17.09 ^a (5.86)	0.34	17.80 ^a (4.24)	0.65	15.80 ^a (6.72)	0.13	22.67 ^a (3.83)	0.72	22.50 ^a (2.89)	0.84
Feedback Receptivity	18.36 ^a (4.78)	0.56	20.30 ^a (4.14)	0.67	18.40 ^a (2.19)	0.91	17.67 ^a (5.96)	0.32	14.25 ^a (3.50)	0.76
Time Management	19.54 ^a (5.34)	0.45	18.80 ^a (5.73)	0.37	12.80 ^a (5.22)	0.48	19.17 ^a (6.55)	0.17	19.00 ^a (2.00)	0.92
Team Orientation	17.55 ^{ab} (4.68)	0.58	19.90 ^a (3.93)	0.70	9.80 ^b (6.94)	0.07	20.60 ^a (6.19)	0.26	22.50 ^a (2.89)	0.84

Note. Means sharing the same superscript do not differ from one another, $p > .05$. Maximum values for each competency are 25.0, indicating that all SMEs rated the competency as both “absolutely essential” and used “daily” by trainees.

management when considering the fit of incoming trainees. Although differences in ratings across specialties may at first appear trivial, a difference of 22.5 (pediatric surgery's rating of communication ability) and 23.3 (critical care surgery's rating of communication ability) can have substantial implications from a test development standpoint, influencing the number of items created, the type(s) of assessments used to measure the competency, and overall weights assigned to that competency.

Perceptions of organizational culture, on the other hand, were consistent regardless of program affiliation. Organizational scientists would classify this widespread agreement about the salience and importance of various organizational features as a “strong” culture, one in which a central value system and patterns of behavior exists.^{8,13,24} For departments with a more negative or “toxic” culture, having such a strong pattern of agreement would be challenging for any effort to implement change or recruit new members. Fortunately, given the features of this department's culture, having a strong culture is beneficial, emphasizing numerous constructive aspects (social support, input seeking, self-actualizing) with minimal potentially harmful elements (oppositional, competitive, hierarchical). Given research demonstrating that leaders are the most influential shapers of culture,²⁵ these results suggest that educational leadership within the department have been successfully attending to, monitoring, and rewarding positive behaviors and practices within each of the programs, thereby impacting the development and strengthening of the positive cultural elements.

These data have a number of implications for both the organization and the surgical education community. First, this study highlights how methods can be developed to empirically define the pattern of values and expectations that define organizational culture within a surgery department. Adoption of quantitative methods, compared to the traditional culture research requiring

qualitative methods,²⁵ can allow us to quantify the higher-order social-psychological fabric of the organization, opening a number of doors for exploring differences in culture across training programs and institutions. Additionally, being able to measure culture can also allow us to explore patterns of change and evaluate the relative effectiveness of interventions aimed at changing or improving culture. For programs seeking to evolve their culture – whether that is away from a traditionally malignant or hierarchical culture or toward a more open and innovative culture – measurement is the first step.

Finally, these results have a number of implications for program recruitment and selection. Programs seeking to maximize p-o fit may be wise to share accurate information about their program culture and competency expectations on program websites, at networking events, and at other venues where interacting and communicating with potential applicants takes place. Programs who have gone through the systematic process of defining and achieving consensus on their desired and required competencies and organizational culture can have confidence in the accuracy and consistency of these messages. Given that applicants develop their perceptions about an organization's culture prior to interviewing, and that organizational culture beliefs developed from brief work experiences (e.g., rotations and sub-internships) and shared through word of mouth from social networks are often inaccurate,²⁶ programs need to be intentional about the cultural attributes they share and emphasize with potential applicants. This may be even more important during this era of remote interviewing when applicants will not be able to meet members of an organization face-to-face. While no program should attempt to beguile applicants with false information about their culture (thereby increasing likelihood of poor fit, lower commitment, and increased turnover), programs seeking to change their culture may consider actively highlighting the desired cultural attributes in order to attract new

Table 2
Descriptions of each organizational culture dimension.

Dimension	Description	# of Items
Political	Measures the extent to which networking is important for success within the program	3
Hierarchical	Measures the extent to which seniority is awarded authority and the importance of wielding that authority over juniors	3
Competitive	Measures the extent to which trainees are rewarded for competing with one another	3
Social Support	Measures the extent to which strong interpersonal bonds among trainees are necessary for a program	6
Perfectionistic	Measures the importance of avoiding mistakes and persistent hard work to the program	6
Dependence	Measures the extent to which independent decision making by trainees is sought by the program	2
Input Seeking	Measures the extent to which trainees are involved in program decisions	4
Self-directed	Measures the extent to which trainees are expected to set and meet their own goals	3
Conventional	Measures the extent to which trainees are expected to adapt to the way the program does things	3
Self-actualization	Measures the extent to which trainee growth and quality of work is rewarded by the program	6
Oppositional	Measures the extent to which being critical of others is rewarded by the program	3
Conforming	Measures the extent to which avoiding conflict with others is important to the program	2

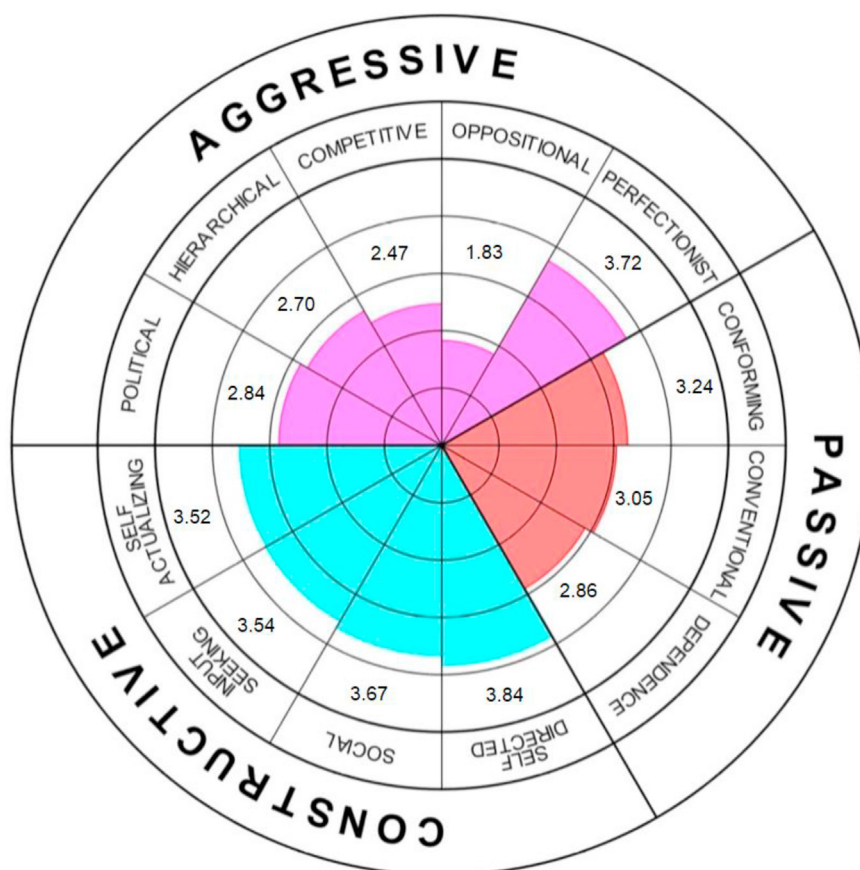


Fig. 1. Mean ratings for each organizational culture dimension.

members whose values are consistent with those cultural attributes and who in turn can help change the organizational culture.

For the programs within the department studied here, sharing specific examples of program offerings that facilitate social and emotional bonds (social support), highlighting the infrastructure and avenues through which trainees are able to provide input into the educational program (input seeking), emphasizing that hard work and persistence are expected (perfectionism), demonstrating how the program has prioritized the fulfillment of trainees' unique talents and career goals (self-actualization), and emphasizing the value of autonomous goal setting is important (self-directed) can help ensure potential applicants gain accurate insights into the organizational culture.

As with any study, there are a number of limitations worth mentioning. Although we included five different training programs in this study, these results represent data from just one department. While the differences in desired competencies aligns with other research showing that similar types of surgery training programs differ in their competency needs and expectations,²⁷ more data is needed across the surgery community to better understand the extent to which these differences exist. In addition, data on the predictive ability of the modified version of the OCI used in this study is not yet available. More data from across the surgical community examining how different aspects of organizational culture are related to outcomes such as resident turnover and performance is needed. These data were also provided via self-report methods of individuals identified as key stakeholders within each program. Although all responses were anonymous and kept confidential, the extent to which any faculty or trainee felt pressured to provide "positive" responses to either the competency

or culture questionnaire is unknown. Further, the extent to which these stakeholders' opinions represent all of those within their program, and thus if any discrepant findings would have emerged if others were included, is also uncertain.

Conclusion

Our findings reveal that surgery specialty, even within the same department, can impact the desired and required competencies expected among entering trainees, and that programs should reflect on these differences when forming their applicant screening and interviewing plans. Organizational culture, however, can be strong enough to cross specialty boundaries and result in a cohesive pattern of values, beliefs, and practices agreed upon by all.

Conflicts of interest

The authors declare no relevant conflicts of interest.

References

1. Schein EH. Organizational culture. *Am Psychol*. 1990;45:109–119.
2. McShane S, Von Glinow M. Organizational Behavior. eighth ed. McGraw Hill Education: New York.
3. Meterko M, Mohr DC, Young GT. Teamwork culture and patient satisfaction in hospitals. *Med Care*. 2004;42:492–498.
4. Mahl S, Lee SK, Ross Baker G, Cronin CMG, Stevens B, Ye XY. The association of organizational culture and quality improvement implementation with neonatal outcomes in the NICU. *J Pediatr Health Care*. 2015;29:435–441.
5. Applebaum NP, Lee N, Amendola M, Dodson K, Kaplan B. Surgical resident burnout and job satisfaction: the role of workplace climate and perceived support. *J Surg Res*. 2019;234:20–25.

6. Bongiovanni T, Yeo H, Sosa JA, et al. Attrition from surgical residency training: perspectives from those who left. *Am J Surg*. 2015;210:648–654.
7. Bing-You R, Ramani S, Ramesh S, et al. The interplay between residency program culture and feedback culture: a cross-sectional study exploring perceptions of residents at three institutions. *Med Educ Online*. 2019;24:1.
8. Hoffman BJ, Woehr DJ. A quantitative review of the relationship between person-organization fit and behavioral outcomes. *J Vocat Behav*. 2006;68:389–399.
9. Verquer ML, Beehr TA, Wagner SH. A meta-analysis of relations between person-organization fit and work attitudes. *J Vocat Behav*. 2003;63:473–489.
10. Collins CJC, Porras JL. *Built to Last: Successful Habits of Visionary Companies*. New York: Harper Business; 1994.
11. Silverthorne C. The impact of organizational culture and person-organization fit on organizational commitment and job satisfaction in Taiwan. *Leader Organ Dev J*. 2004;25:592–599.
12. O'Reilly CA, Chatman J, Caldwell DF. People and organizational culture: a profile comparison approach to assessing person-organization fit. *Acad Manag J*. 1991;34:487–516.
13. Kristof-Brown AL, Zimmerman RD, Johnson EC. Consequences of individual's fit at work: a meta-analysis of person-job, person-organization, person-group, and person-supervisor fit. *Person Psychol*. 2005;58:281–342.
14. Pulcrano M, Evans SR, Sosin M. Quality of life and burnout rates across surgical specialties: a systematic review. *JAMA Surg*. 2016;151:970–978.
15. Khoushal Z, Hussain MA, Greco E, et al. Prevalence and causes of attrition among surgical residents: a systematic review and meta-analysis. *JAMA Surg*. 2017;152:265–272.
16. Louridas M, Szasz P, de Montbrun S, Harris KA, Grantcharov TP. Optimizing the selection of general surgery residents: a national consensus. *J Surg Educ*. 2017;74:100–107.
17. Summary report for: 29-1067.00 - surgeons. O*NET OnLine. Published July 28, 2020 <https://www.onetonline.org/link/summary/29-1067.00>. Accessed August 12, 2020.
18. Cooke RA, Lafferty JC. *Level V : Organizational Culture Inventory (Form 1)*. Plymouth, MI: Human Synergistic; 1983.
19. Seago JA. Work group culture, stress, and hostility: correlations with organizational outcomes. *J Nurs Adm*. 1996;26:39–47.
20. Chaudhry A, Yuan L, Hu J, Cooke RA. What matters more? The impact of industry and organizational factors on organizational culture. *Manag Decis*. 2016;54:570–588.
21. Xenikou A, Simosi M. Organizational culture and transformational leadership as predictors of business unit performance. *J Manag Psychol*. 2006;21:566–579.
22. Ledim O. Diversity management: an organisational culture audit to determine individual differences. *J Appl Bus Res*. 2015;31:1733–1746.
23. Cooke RA, Szumal JL. Measuring normative beliefs and shared behavioral expectations in organizations: the reliability and validity of the Organizational Culture Inventory. *Psychol Rep*. 1993;72:1299–1330.
24. Chatman J. Matching people and organizations: selection and socialization in public accounting firms. *Adm Sci Q*. 1991;36:459–484.
25. Schneider B, Gonzalez-Roma V, Ostroff C, West MA. Organizational climate and culture: reflections on the history of the constructs in the journal of applied psychology. *J Appl Psychol*. 2017;102:468–482.
26. Cable DM, Aiman-Smith L, Mulvey PW, Edwards JR. The sources and accuracy of job applicants' beliefs about organizational culture. *Acad Manag J*. 2000;43:1076–1085.
27. Gardner AK, Cavanaugh KJ, Willis RE, et al. Great expectations? Future competency requirements among candidates entering surgery training. *J Surg Educ*. 2020;77:267–272.