

Core Personal Competencies Important to Entering Students' Success in Medical School: What Are They and How Could They Be Assessed Early in the Admission Process?

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Abstract

Assessing applicants' personal competencies in the admission process has proven difficult because there is not an agreed-on set of personal competencies for entering medical students. In addition, there are questions about the measurement properties and costs of currently available assessment tools. The Association of American Medical College's Innovation Lab Working Group (ILWG) and Admissions Initiative therefore engaged in a multistep, multiyear process to identify personal competencies important to entering students' success in medical school as well as ways to measure them early in the admission process.

To identify core personal competencies, they conducted literature reviews, surveyed U.S and Canadian medical school admission officers, and solicited input from the admission community. To identify tools with the potential to provide data in time for pre-interview screening, they reviewed the higher education and employment literature and evaluated tools' psychometric properties, group differences, risk of coaching/faking, likely applicant and admission officer reactions, costs, and scalability.

This process resulted in a list of nine core personal competencies rated by stakeholders as very or extremely

important for entering medical students: ethical responsibility to self and others; reliability and dependability; service orientation; social skills; capacity for improvement; resilience and adaptability; cultural competence; oral communication; and teamwork.

The ILWG's research suggests that some tools hold promise for assessing personal competencies, but the authors caution that none are perfect for all situations. They recommend that multiple tools be used to evaluate information about applicants' personal competencies in deciding whom to interview.

There is general agreement in the medical education community about the *academic* competencies that medical students should demonstrate when they matriculate. Widely accepted measures, such as undergraduate grade point averages (UGPAs) and Medical College Admission Test (MCAT) scores, provide information about these competencies early in the medical school admission process. Although the community has agreed on the personal competencies that medical students should demonstrate at graduation,¹ it has not reached consensus on those that are important at entry or how to incorporate them into the admission process.

Albanese and colleagues² estimated that more than 87 different personal qualities are assessed during the admission process. This lack of consensus among schools is surprising given that research has linked certain personal competencies to positive admission and medical school outcomes. For example, Carrothers and colleagues³ found that having good interpersonal skills, knowing one's emotions, recognizing emotions in others, possessing the ability to manage one's emotions in difficult situations, and being able to motivate oneself were frequently cited by medical school admission committee members as desirable attributes for prospective medical students. Similarly, Adams and colleagues⁴ found that demonstrating motivation, a desire to learn, integrity and ethics, self-management, and strong interpersonal and teamwork skills were reported by medical school faculty members, residents, and students as being important to success in medical school.

Researchers have related some of these personal characteristics and skills to

improved patient care outcomes and to patients' ratings of their physicians.^{5,6} For example, good teamwork and collaboration are correlated with improved patient outcomes, patient satisfaction, and greater job satisfaction among physicians.⁷ Patients who report being treated with dignity by their physicians are more likely to adhere to treatment plans and to be satisfied with their care.⁸ Similarly, physicians who "adopt a warm, friendly, and reassuring manner" with their patients are more effective than those who keep consultations formal and do not offer reassurances.⁹ Recently, Hojat and colleagues¹⁰ found that patients of physicians with high levels of empathy have better health outcomes than patients of physicians with moderate and low levels of empathy. Moreover, when physicians' personal skills are lacking, negative professional outcomes are likely. For instance, Papadakis and colleagues¹¹ showed that unprofessional behavior in medical school (e.g., irresponsibility, lack of capacity for self-improvement) predicts later disciplinary action by state medical boards.

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The Role of Personal Competencies in Medical School Admissions

Leaders of the Association of American Medical Colleges (AAMC)¹² and others in the medical education community have called for more emphasis to be placed on applicants' personal competencies in the admission process. Many applicants who have the potential to become excellent doctors may not be invited to interview because admission committees lack information about their personal competencies. Data show that a significant part of admission screening takes place before interviews: In 2011, the average applicant submitted 14 applications but received less than 2 interview invitations.¹³

This challenge—identifying and accepting applicants who have the knowledge, skills, attitudes, and/or diversity that could make a positive contribution to medical schools and the physician workforce—highlights the need to develop tools that present readily usable, standardized data about applicants' personal competencies for inclusion in pre-interview screening. To meet this challenge, the medical education community must first agree on a universal set of personal competencies to measure as well as a set of tools that balances the needs and goals of the admission community with practical (e.g., cost, accessibility) and psychometric issues. Many of the tools currently available to provide data about applicants' personal competencies do not have sufficient reliability and predictive validity^{14,15}; moreover, they do not present data in an easily consumable format or in time for pre-interview screening.

In this article, we describe the results of research designed to address these two needs. First, we identify a set of core personal competencies that students should demonstrate when they enter medical school. Then, we evaluate existing tools that could be used to assess these competencies. Finally, we make recommendations for future research.

Defining Core Personal Competencies for Entering Medical Students

Although there have been attempts to systematically define the personal

competencies that medical school matriculants should demonstrate on entry (e.g., the AAMC explored this in the 1970s and 1990s),¹⁶ there has been little effort to build consensus about these competencies in the wider medical education community. Therefore, the AAMC undertook a rigorous, multi-year process to research and identify core personal competencies for students entering medical school in the 21st century. This process (Table 1) relied on the work of individuals involved in three large-scale projects—the committee conducting the fifth comprehensive review of the MCAT exam (MR5 Committee), the Innovation Lab Working Group (ILWG),* and the AAMC Admissions Initiative†—as well as input from stakeholders representing admissions, academic affairs, student affairs, and multicultural/diversity affairs.

Identifying personal characteristics important to success in medical school

The MR5 Committee began the process by conducting two surveys designed to identify the knowledge, skills, and personal characteristics that are important for entering students to be successful in medical school. In 2008, U.S. and Canadian admission officers were asked to describe their school's admission process and to rate the importance of 41 personal characteristics to success in medical school. In 2009, U.S. and Canadian academic affairs officers were asked to rate the importance of 72 characteristics to success in medical school. Data from these two surveys^{17,18} served as a starting point to prioritize personal characteristics for future study.

Developing the set of core personal competencies

Next, the ILWG conducted a multistep job analysis to identify the core set of personal competencies that entering students require to be successful in

medical school. A job analysis is a systematic process used to determine the tasks required by a position and the competencies required to perform them successfully. In employment settings, conducting a job analysis before designing a selection system is considered a best practice.¹⁹ We first reviewed the literature, published through summer 2012, on the importance of various personal characteristics and behaviors in medical education, and then linked the behaviors deemed important for medical student performance with the personal characteristics previously identified as important in the MR5 Committee's admission¹⁷ and academic affairs¹⁸ officer surveys. (This linking activity is a critical component of the job analysis.) We then asked the following questions about each personal characteristic:

1. Is this characteristic related to medical student performance, particularly the behaviors associated with success in medical school?
2. Do students need to display this characteristic at entry into medical school?
3. Is it reasonable to assume that medical school applicants can demonstrate this characteristic? (Is it developmentally appropriate?)
4. Is this characteristic fixed, or is it malleable? Is it something that medical education can build on as the student matures and is exposed to new experiences?

On the basis of the answers to these questions, we selected a subset of personal characteristics to develop into core personal competencies. We adopted this approach to be consistent with calls for an integrated and competency-based approach to medical education, the competency-based approaches used by others in the medical community (e.g., the Accreditation Council for Graduate Medical Education [ACGME] Outcomes and Milestones Projects,¹ the Scottish Doctor Project²⁰), and research conducted in the United Kingdom on a competency model for general practitioners.²¹ This approach also allowed us to group related characteristics, knowledge, skills, and attitudes into larger behavioral categories that are important for success in medical school and to reduce the number of characteristics identified as "top priorities."

* The authors of this article were members of the ILWG, which was composed of four medical school representatives (T.W.K., S.K.P., C.T., J.P.W.), one consultant with expertise in developing assessments of personal characteristics (Nick Vasilopoulos), and three AAMC staff members (D.M.D., Karen Mitchell, Karla Whittaker).

† The AAMC Admissions Initiative (<https://www.aamc.org/initiatives/admissions/>) is a multiyear project designed to help medical schools transform their admission processes. Its purpose is to develop new tools and improve existing tools to provide information to medical schools about applicants' personal and academic competencies.

Table 1

Summary of the Multi-Year Process Used to Develop the Core Personal Competencies for Entering Medical Students, Association of American Medical Colleges (AAMC)

Group	Time frame	Actions taken
MR5 Committee*	Spring 2008	<ul style="list-style-type: none"> Conducted site visits at 8 U.S. and Canadian medical schools that use the Medical College Admission Test (MCAT) to learn about the personal characteristics required for success at those medical schools and their admission practices.
	Summer to fall 2008	<ul style="list-style-type: none"> Surveyed admission officers at U.S. MD-granting medical schools and Canadian medical schools that use the MCAT exam about their admission practices and the knowledge, skills, and personal characteristics required for success in medical school. Collected input about personal characteristics from constituents at the AAMC's annual meeting.
	Spring 2009	<ul style="list-style-type: none"> Collected input about personal characteristics from constituents at the AAMC's spring meetings.
	Summer 2009	<ul style="list-style-type: none"> Surveyed academic affairs officers at U.S. MD-granting medical schools and Canadian medical schools that use the MCAT exam about the knowledge, skills, and personal characteristics required for success in medical school.
	Fall 2009	<ul style="list-style-type: none"> Collected input about personal characteristics from constituents at the AAMC's annual meeting.
Innovation Lab Working Group	December 2009 to May 2010	<ul style="list-style-type: none"> Convened by the AAMC to identify core personal competencies for entering medical students and evaluate tools for assessing them. Reviewed the following materials: <ul style="list-style-type: none"> Data from the 2008 admission officers' survey¹⁷ Data from the 2009 academic affairs officers' survey¹⁸ Higher education and employment literatures about personal characteristics and common assessment tools Collected feedback from constituents at the AAMC annual meeting, AAMC regional meetings, MR5 meetings, and Holistic Review Project Advisory Committee meetings. Drafted a list and definitions of core personal competencies for entering medical students based on results of the admission officers and academic affairs officers' surveys, constituent feedback, and the literature.
	April to May 2010	<ul style="list-style-type: none"> Conducted a survey of admission officers at U.S. MD-granting medical schools and Canadian medical schools that use the MCAT exam to validate the importance of the draft personal competencies required at entry to be successful in medical school. Shared survey results and collected input about draft personal competencies from constituents at AAMC regional meetings.
	Fall 2010	<ul style="list-style-type: none"> Collected input on draft personal competencies from constituents at outreach events.
Admissions Initiative	Summer 2011	<ul style="list-style-type: none"> Convened by the AAMC to review and finalize the list of personal competencies and to investigate tools to assess personal competencies.
	Fall 2011	<ul style="list-style-type: none"> Collected input on draft personal competencies from constituents at the AAMC's annual meeting.
	February 2013	<ul style="list-style-type: none"> Received endorsement of final list of 9 core competencies from the AAMC Committee on Admissions.

*MR5 Committee indicates the committee that conducted the fifth comprehensive review of the MCAT exam.

We initially identified and drafted definitions for seven personal competencies for prospective medical students. In spring 2010, we invited the associate/senior associate dean for admissions (or his or her designee) at each U.S. MD-granting medical school and the Canadian medical schools that use the MCAT to participate in an ILWG survey designed to validate the importance of the draft competencies. The 41-item, online survey provided a definition for each competency. Respondents were asked to rate each competency's importance to entering students' success in medical school and their satisfaction with tools currently available to assess it. They were also asked

to indicate when in the admission process they would prefer to receive information about each competency. Nonresponders received three reminder e-mails. Ninety-eight (69%) of 143 admission officials responded, representing 65 (66%) public and 33 (34%) private institutions. Eight (8%) of the schools represented were in Canada, and the rest were in the United States (31 [32%] in southern states, 23 [23%] in northern states, 21 [21%] in central states, and 14 [14%] in western states).

As shown in Table 2, on average, all of the draft personal competencies were rated by admission officials as "very important" to "extremely important."

Respondents were not, however, satisfied with the quality of information available about these competencies during the admission process. Most reported that they would like to receive information about each competency at the pre-interview screening stage, when the data could be used to help select the interview pool (Table 3). Results did not differ by respondent institution type (public versus private) or location.

On the basis of these findings, we initially recommended that the AAMC engage in further study of six of the seven proposed core personal competencies for entering students.

Table 2

Admission Officers' Ratings of Core Personal Competencies' Mean Importance to Entering Students' Success in Medical School and Their Mean Satisfaction With the Tools Currently Available to Assess These Competencies, 2010*

Core personal competency	Importance to entering students' success in medical school [†]	Satisfaction with tools currently available to assess [‡]
Ethical responsibility to self and others	4.8	2.8
Social skills	4.6	3.3
Reliability and dependability	4.5	2.9
Capacity for improvement	4.4	2.9
Resilience and adaptability	4.3	2.8
Service orientation	4.3	3.6
Teamwork [§]	4.3	—
Oral communication [§]	4.2	—
Cultural competence [§]	3.7	—

*Ratings reflect the responses of 98 admission officers at U.S. MD-granting medical schools and Canadian medical schools that use the Medical College Admission Test on the Innovation Lab Working Group's 2010 personal competencies survey (response rate = 69%). On that survey, "ethical responsibility to self and others" was called "integrity and ethics," "social skills" was called "social and interpersonal skills," and "capacity for improvement" was called "desire to learn."

[†] Respondents rated the importance of each personal competency using a five-point scale (1 = not important, 2 = somewhat important, 3 = important, 4 = very important, 5 = extremely important).

[‡] Respondents rated overall satisfaction with tools available to assess each competency using a five-point scale (1 = not satisfied, 2 = somewhat satisfied, 3 = satisfied, 4 = very satisfied, 5 = extremely satisfied).

[§] Separate importance and satisfaction ratings for this competency were not collected on the 2010 survey because it was added to the list after the data collection was complete. The mean reported is the average of the importance ratings from the 2008 admission officers' survey¹⁷ and the 2009 academic affairs officers' survey.¹⁸ The response rate to the 2008 admission officers' survey was 90% (n = 129), and ratings were made on the same five-point scale as in the 2010 survey.

Collecting feedback on the core personal competencies

The ILWG's recommendation served as the foundation for the AAMC Admissions Initiative. One of that group's

first projects was to review the ILWG's draft definitions of the recommended core personal competencies. Admissions Initiative members collected input from the AAMC's Group on Student Affairs

Table 3

Admission Officers' Preferences Regarding the Receipt of Information About Applicants' Personal Characteristics at the Pre-interview Screening Stage, 2010*

Core personal competency	% Who would prefer information at pre-interview screening stage
Reliability and dependability	81
Resilience and adaptability	81
Capacity for improvement	76
Ethical responsibility to self and others	74
Service orientation	71
Social skills	68
Cultural competence [†]	—
Oral communication [†]	—
Teamwork [†]	—

*Ninety-eight admission officers at U.S. MD-granting medical schools and Canadian medical schools that use the Medical College Admission Test responded to the Innovation Lab Working Group's 2010 personal competencies survey (response rate = 69%). Survey question: If information from *reliable and valid* measures of [insert competency name] were available to you, how would you use it in selecting your applicants? (1) In selecting applicants who receive secondary applications; (2) In selecting applicants who are invited to interview; (3) Not at all; we have local tools to assess this competency. On that survey, "ethical responsibility to self and others" was called "integrity and ethics," "social skills" was called "social and interpersonal skills," and "capacity for improvement" was called "desire to learn."

[†] Data are not available for this competency because it was added to the list after the data collection was complete.

(GSA), Committee on Admissions (COA), and Holistic Review Project Advisory Committee, as well as from AAMC staff representing different constituencies and from constituents at AAMC regional and annual meetings. Revisions to the competency definitions were generally minor and related to form and organization. Many constituents stated that cultural competence, oral communication, and teamwork (which were subsumed in the definitions of the ILWG's six recommended competencies) should be stand-alone competencies to signal their importance to medical schools and to ensure that they receive adequate attention during the admission process. Before adding these three as core personal competencies, Admissions Initiative members reviewed data from the MR5 Committee's admission and academic affairs officers' surveys^{17,18} about their importance to success in medical school. As shown in Table 2, on average, each of these three was rated as "important" or "very important" in those surveys. As such, they were added, resulting in a final list of nine core personal competencies for entering medical students.

Approving the nine core personal competencies for entering medical students

In February 2013, the AAMC's COA endorsed the final list of nine core personal competencies for entering medical students (defined in Table 4): ethical responsibility to self and others; reliability and dependability; service orientation; social skills; capacity for improvement; resilience and adaptability; cultural competence; oral communication; and teamwork.

These personal competencies are linked to behaviors associated with success in medical school, are linked to the ACGME competencies, and build on the personal characteristics rated by admission and academic affairs officers as the most important for students to demonstrate at entry in order to be successful in medical school.

Exploring Tools to Assess the Core Personal Competencies Early in the Admission Process

Although the ILWG survey suggested a desire among admission officers for

Table 4
Core Personal Competencies for Entering Medical Students*

Competency	Definition
Ethical responsibility to self and others	Behaves in an honest manner; cultivates personal and academic integrity; adheres to principles; follows rules and procedures; resists peer pressure to engage in unethical behavior and encourages others to behave in honest and ethical ways; develops and demonstrates ethical and moral reasoning.
Reliability and dependability	Consistently fulfills obligations in a timely and satisfactory manner; takes responsibility for personal actions and performance.
Service orientation	Demonstrates a desire to help others and sensitivity to others' needs and feelings; demonstrates a desire to alleviate others' distress; recognizes and acts on his/her responsibilities to society, locally, nationally, and globally.
Social skills	Demonstrates an awareness of others' needs, goals, feelings, and the ways that social and behavioral cues affect people's interactions and behaviors; adjusts behaviors appropriately in response to these cues; treats others with respect.
Capacity for improvement	Sets goals for continuous improvement and for learning new concepts and skills; engages in reflective practice for improvement; solicits and responds appropriately to feedback.
Resilience and adaptability	Demonstrates tolerance of stressful or changing environments or situations and adapts effectively to them; is persistent, even under difficult situations; recovers from setbacks.
Cultural competence	Demonstrates knowledge of social and cultural factors that affect interactions and behaviors; shows an appreciation and respect for multiple dimensions of diversity; recognizes and acts on the obligation to inform one's own judgment; engages diverse and competing perspectives as a resource for learning, citizenship, and work; recognizes and appropriately addresses bias in self and others; interacts effectively with people from diverse backgrounds.
Oral communication	Effectively conveys information to others using spoken words and sentences; listens effectively; recognizes potential communication barriers and adjusts approach or clarifies information as needed.
Teamwork	Works collaboratively with others to achieve shared goals; shares information and knowledge with others and provides feedback; puts team goals ahead of individual goals.

*This list represents a core set of entry-level personal competencies required for success at most medical schools. It is not intended to be exhaustive of all the entry-level competencies required for students to be successful in medical school.

tools that assess applicants' personal competencies early in the admission process, there are many unanswered questions about the use and value of such measures in medical school admissions.²² To begin to answer these questions, the ILWG reviewed the medical, higher education, and employment literatures published through summer 2012. We identified more than 50 seminal articles (including several meta-analyses) and six nonpublished technical reports about tools currently used to measure personal competencies in higher education and employment settings. We made subjective, holistic judgments about tools' potential to provide information on applicants' core personal competencies for use in the pre-interview screening stage of the admission process. We judged six types of tools according to the following eight criteria: validity, reliability, group differences, susceptibility to faking and coaching, applicant reactions, user reactions, cost/resource utilization, and scalability for use in pre-interview screening (Appendix 1).

Situational judgment tests

In situational judgment tests (SJTs), examinees are asked to indicate how

they would (or should) respond to dilemmas presented in text-based, video, or animated scenarios. Response formats vary: Examinees may be asked to select from multiple-choice options, identify the most and least effective responses, and/or answer open-ended questions. SJTs have been used in medical school admission processes in Canada (the CASPer assessment²³), Belgium,^{24–26} and Israel.²⁷

The employment literature²⁸ provides strong evidence for the reliability and validity of SJTs, as does research conducted in Belgium,²⁶ where an SJT has been used in the medical school admission process since 1997. Additionally, research from the United Kingdom shows that SJT scores predict competency-based ratings of physician performance and provide incremental validity above and beyond a clinical problem-solving test.²⁹ Further, applicants hold generally positive attitudes about SJTs.³⁰

There is some evidence suggesting that there may be small racial/ethnic group differences in performance on SJTs that emphasize decision making.³¹ However, research conducted by the College Board

and the Law School Admission Council indicates that including these tests in the admission process may increase the percentage of African American and Latino matriculants compared with using academic data alone, and that performance on SJTs is the best predictor of "lawyering effectiveness."^{32,33} These studies were conducted in a research (rather than operational) environment, though.

SJTs are somewhat expensive to develop because of the technical expertise needed to create and score scenarios. However, they are scalable for use in pre-interview screening because they can be administered to a large number of applicants before the interview. Further, when SJTs are scored, data are presented in a format that is easy to consume.

Standardized evaluations of performance

In standardized evaluations of performance (SEPs), raters use a graphic, comparative, or behaviorally anchored rating scale to evaluate applicants on a set of competencies.

Although most medical school admission processes use nonstandardized letters of recommendation—which have poor interrater reliability for nonacademic variables,³⁴ have poor predictive validity, and lack comparative data—other graduate and professional program (e.g., veterinary medicine, optometry, physical therapy) admission processes use SEPs. In 2009, the Educational Testing Service introduced the Personal Potential Index,³⁵ an SEP for use in graduate admissions, but there is no published literature to date on its psychometric properties.

Research on the Medical Student Performance Evaluation shows small but significant observed positive correlations between standardized evaluations and performance on comprehensive clinical performance exams.³⁶ Admission officers are likely to have positive attitudes about SEPs because raters must include specific examples of behaviors illustrating applicants' personal competencies.³⁷ Although the employment literature includes some evidence of small racial/ethnic group differences,³⁸ there is no evidence of group differences in the educational literature.

There is potential for rater leniency and consequent lack of variance in ratings, though. Given that applicants select their SEP raters, those raters may feel obligated to act as advocates rather than as objective evaluators. SEPs are also somewhat expensive because of the expertise needed to develop them and the infrastructure required to support their use. However, they are scalable for use with large applicant pools. SEP ratings would make data about applicants' personal competencies available in an easy-to-use format in time for pre-interview screening.

Accomplishment records

Accomplishment records, also known as autobiographical questionnaires, are standardized descriptions of achievements and experiences. Applicants are asked to describe behaviors related to a set of important personal competencies. Typically, applicants write about a situation in which they demonstrated a certain competency, describing the specific actions taken and the outcome. The resulting narratives can be scored by raters or left unscored. Variations

of this tool are already used in medical school admission processes, such as in the descriptions of experiences in the Work/Activities section of the American Medical College Application Service (AMCAS) application, in secondary applications developed at individual medical schools, and as part of the MOR²⁷ center assessment.

Reliability is best when accomplishment records are collected in proctored settings and are scored by multiple raters.³⁹ Validity data are not available with respect to their use in admissions. Applicants and users may have lukewarm reactions to them because of the added workload. There is little published research on unscored accomplishment records, but they are inexpensive to develop and can be administered to large numbers of applicants. It should be noted that unscored accomplishment records cannot be easily incorporated into pre-interview screening because a substantial amount of time and experience is needed to read and interpret them.

Personality and biographical data inventories

Personality inventories and biographical data inventories ask applicants to indicate the extent to which a series of statements accurately describe them, typically using a Likert-type response scale. These tools are relatively inexpensive to develop and can be administered to large numbers of applicants.

Both types of inventories have good psychometric properties and are commonly used in employee selection. However, there are concerns about their use in a high-stakes admission context. A primary concern is the potential for coaching and faking responses. Research demonstrates that applicants can respond to these types of inventories in ways that may make them appear more attractive and may compromise the validity of these assessments.⁴⁰ Bardes and colleagues²² suggest that this phenomenon could be exacerbated in the medical school admission context because test preparation companies and others routinely help applicants prepare to apply to medical school. Applicants from low socioeconomic backgrounds who do not have access to such coaching may be at a disadvantage. There could also be negative reactions from

applicants regarding privacy issues³⁰ and from admission officers concerning the validity of these assessments.

Local interviews

The majority of medical schools use local (on-campus) interviews to assess applicants' personal competencies. Interview types range from unstructured to structured, but most medical school interviews are semistructured. The typical medical school interview process includes a standard set of dimensions or questions, uses rating scales to evaluate applicant responses, and involves multiple interviews and/or interviewers.⁴¹ Local interviews have a number of limitations, however. Reliability for unstructured interviews is poor, and the practice of providing interviewers with access to applicants' application data introduces bias.^{42,43} In addition, local interviews are subject to rater error, and ratings may have more to do with the interviewer than the interviewee.⁴³

Although the unstructured personal interview has not been shown to predict clinical performance in medical school,⁴⁴ semistructured interview scores have been shown to predict clerkship performance.^{45,46} In recent years, the Multiple-Mini Interview (MMI)[‡] pioneered by McMaster University,^{14,15} structured interviews conducted at the University of Iowa Carver College of Medicine,⁴⁷ and "behavioral event interviews" used by the Scholarly Excellence, Leadership Experiences, Collaborative Training program at the Morsani College of Medicine⁴⁸ have paved the way for improved measurement of personal characteristics via interviews.

The employment⁴⁹ and medical school admission^{45,46,50,51} literatures provide strong evidence for the reliability and validity of semistructured and structured interviews. Applicants and interviewers generally have positive attitudes about semistructured interviews,³⁰ and applicants perceive the MMI process as being fair.⁵² There is no evidence of racial/

[‡] It should be noted that the MMI could be categorized as an assessment center because it includes multiple exercises (i.e., situational interview questions, role-play activities, and group activities). We categorized it as an interview because of its heavy emphasis on situational interview stations. In addition, in our experience, most admission officers view the MMI as a variant of an interview.

ethnic group differences on interviews in the educational literature.

One concern about interviews is the potential for coaching and faking. Research suggests that applicants actively try to present themselves in a more favorable light during interviews and that those who do so successfully are likely to obtain higher interview scores.^{53–55} Unstructured local interviews may provide important information about medical school applicants' personal competencies, but they lack reliability and have not been shown to predict future performance. Semistructured and structured interviews may also provide information about personal competencies and have better psychometric properties. However, local interviews are resource intensive.

Assessment centers

Assessment centers can employ several standardized exercises (e.g., interviews, role-plays, in-baskets, group discussions) to provide multiple opportunities for multiple raters to evaluate applicant behaviors. Assessment centers have been used in medical school admission processes in Belgium^{24–26} and Israel.²⁷ In the United States, assessment centers' role-playing component has been used in the United States Medical Licensing Examination Step 2 Clinical Skills exam and in various medical schools' objective structured clinical exams. The employment,^{56,57} medical school admission,^{24–26} and medical practice⁵⁸ literatures all provide evidence for the reliability and validity of assessment centers. In Israel, applicants and admission officers who participated in the MOR perceived it to be fair for screening purposes.²⁷ Data from assessment centers provide important information about applicants' personal competencies, but such centers are resource intensive. Thus, it is not feasible to conduct them on a national level to provide data in time for pre-interview screening.

Tools recommended for future study

After reviewing the literature and evaluating potential tools on the eight criteria, we suggested that the AAMC further investigate three tools for possible use in assessing applicants' core personal competencies during the admission process: SJTs, SEPs, and accomplishment records. We recommended these tools because each of them

- provides data about personal competencies in a format that is easy to use and would be available in time for pre-interview screening,
- allows for multiple sources of assessment,
- has acceptable validity and is likely to provide predictive value beyond UGPAs and MCAT scores in predicting nonacademic outcomes,
- demonstrates less potential risk of coaching and faking effects compared with other tools,
- is likely to be accepted by applicants and admission officers, and
- avoids exorbitant costs that would likely be passed on to applicants.

Given the many unanswered questions about assessment of personal competencies, we believe that the AAMC should conduct additional research before developing these tools for use in medical school admissions. No tool is perfect for all situations, so we recommend that multiple tools be employed to assess personal competencies to enable admission officers to evaluate the information collected (just as they currently consider both UGPAs and MCAT scores in context). SJTs, SEPs, and accomplishment records should be used together—as part of an “admissions toolbox”—along with data on applicants' academic competencies, in deciding which applicants to interview.

Moving Forward

Lack of consensus about the personal competencies² needed at entry for success in medical school and concerns²² about the tools available to assess them have long hampered changes in medical school admission processes. Yet if medical schools do not incorporate data about applicants' personal competencies into their admission processes, the composition of future matriculating classes is unlikely to change.

In this article, we report the nine core personal competencies for entering medical students that have been endorsed by the AAMC COA: ethical responsibility to self and others; reliability and dependability; service orientation; social skills; capacity for improvement; resilience and adaptability; cultural competence;

oral communication; and teamwork. This is the first list of personal competencies that is likely to generalize to all U.S. MD-granting medical schools and Canadian medical schools that use the MCAT exam, and it provides a common taxonomy for admission researchers. Individual medical schools may require additional personal competencies, but our data suggest that these nine are important for—and can be linked to behaviors critical to—success at the majority of medical schools. Each of these competencies can also be linked to ACGME competencies and competency models for physician performance. Future research should examine the relationships among these personal competencies and performance outcomes at the national level, and whether these personal competencies differ in importance on the basis of medical schools' characteristics (e.g., mission, values).

Our evaluation and comparison of tools currently used to measure personal competencies incorporates research from the employment literature and provides admission officers with new information that may be useful as they evaluate their local admission practices. From a practical perspective, the data and literature reviewed in this article will serve as the foundation for the AAMC Admissions Initiative, which over the next several years will investigate options for developing tools to assess these core personal competencies in the medical school admission process and make recommendations about which tools, if any, should be implemented by medical schools.

Future research on the use of SJTs in medical school admissions should explore different formats for presenting scenarios (e.g., actors, avatars), alternative response formats (e.g., rank order, narrative responses), validity, and the impact of coaching/faking on validity and user acceptance. In addition, research should investigate admission officers' interest in SEPs and in incorporating an accomplishment record in the AMCAS application, as well as the likely value to the admission process. Research should also identify strategies to minimize the negatives and to capitalize on the strengths of the individual tools. In determining which tool (or set of tools) is a viable option for assessing applicants' core personal competencies during the medical school admission process, the AAMC Admissions Initiative

should weigh each tool's advantages and drawbacks and balance them both with the admission community's needs and goals and patients' needs.

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Appendix 1

Strengths and Weaknesses of Tools Currently Available to Assess Core Personal Competencies for Entering Medical Students*

Assessment tool	Description	Validity ^{†,‡}	Reliability [†]	Racial/ethnic group differences [†]	Potential for faking/coaching [†]	Likely applicant reaction [†]	Likely admission officer reaction [†]	Cost and resources [†]	Scalability for use in pre-interview screening [†]
Situational judgment test	<ul style="list-style-type: none"> Examinees indicate how they would (or should) respond to the dilemma presented in a text-based, video, or animated scenario. Response formats include multiple-choice, identifying the most/least effective responses, and open responses. 	+	+	=	=	+	+	=	+
Standardized evaluation of performance	<ul style="list-style-type: none"> Raters evaluate applicants on a set of competencies using a rating scale. Rating formats include graphic, comparative, and behaviorally anchored rating scales. 	=	=	=	- Unknown	=	=	+	+
Accomplishment record (unscored)	<ul style="list-style-type: none"> Applicants describe behaviors related to the competencies being assessed, typically by writing about a situation, the specific actions taken, and the outcome. Narratives can be scored by raters or left unscored. 	Not applicable	Not applicable	=	=	=	=	+	+
Personality and biographical data inventories									
Personality inventory	<ul style="list-style-type: none"> Applicants indicate the extent to which a series of statements accurately describe them. Responses typically use a Likert-type scale. 	=	+	+	-	=	=	+	+
Biographical data inventory	<ul style="list-style-type: none"> Applicants indicate the extent to which a series of statements about past experiences accurately describe them. Responses are typically multiple-choice or use a Likert-type scale. 	+	+	=	-	=	=	+	+

(Appendix continues)

Appendix 1, *Continued*

Assessment tool	Description	Validity ^{†,‡}	Reliability [†]	Racial/ethnic group differences [†]	Potential for faking/coaching [†]	Likely applicant reaction [†]	Likely admission officer reaction [†]	Cost and resources [†]	Scalability for use in pre-interview screening [†]
Local interview									
Unstructured interview	<ul style="list-style-type: none"> • Questions vary in this formal interaction between an applicant and one or more interviewers. • Scoring is unspecified. 	-	-	=	=	+	+	-	Not applicable
Semistructured interview	<ul style="list-style-type: none"> • The number and content of questions are predetermined in this formal interaction between an applicant and one or more interviewers. • Scoring may be structured. 	+	+	+	=	+	+	-	Not applicable
Assessment center	<ul style="list-style-type: none"> • Applicants participate in several standardized exercises (e.g., interviews, role-plays, in-baskets, group discussions). • Multiple opportunities are provided for behavioral evaluations by multiple raters. 	=	=	=	=	+	+	-	-

*The summary of empirical evidence summarized in this appendix is subjective and reflects consensus among the Innovation Lab Working Group members after reviewing and discussing data from the higher education and employment literatures published through summer 2012.

[†] Plus sign indicates that data are favorable and suggest use; equals sign, data are mixed but still positive overall; minus sign, data suggest caution before implementation; unknown, limited or no empirical research available.

[‡] Decision rule for assigning a value to validity data: Plus sign indicates average validity ≥ 0.20 ; equals sign, average validity between 0.11 and 0.19; minus sign, average validity ≤ 0.10 .