


ARTICLE

Against Intelligence: Rethinking Criteria for Medical School Admissions

Jacob M. Appel 

Department of Psychiatry, Icahn School of Medicine at Mount Sinai, New York, New York, USA
Email: jacobmappel@gmail.com

Abstract

Intelligence, as measured by grades and/or standardized test scores, plays a principal role in the medical school admissions process in most nations. Yet while sufficient intelligence is necessary to practice medicine effectively, no evidence suggests that surplus intelligence beyond that threshold is correlated with providing higher quality medical care. This paper argues that using perceived measures of intelligence to distinguish between applicants, at levels that exceed the level of intelligence required to practice medicine, is both unfair to applicants and fails to serve the interests of patients.

Keywords: medical education; admissions; intelligence; intelligence testing; professionalism; medical school

The primary criterion for admission to medical school is intelligence. This largely unquestioned aspect of the gatekeeping process for the medical profession is true in the United States, Canada, Great Britain, Australia, Japan, the states of the European Union, and most other nations across the globe. As discussed below, critics may question whether grades and test scores are accurate measures of intelligence, and even which forms of intelligence should be measured, but the underlying premise that high intelligence should be required goes unchallenged. That is not to suggest that intelligence is the *only* dispositive factor involved in the admissions process. In the United States, the trend has increasingly shifted toward holistic review, in which the overall strengths of applicants are measured in the context of their social capital and their opportunities for advancement.¹ A first-generation college graduate from a low-income family and a background underrepresented in medicine (URiM) may not produce test scores equal to those of a high-income applicant whose parents are physicians but may prove as intellectually able, or more so, and ultimately as or more gifted a physician. However, among applicants similarly situated with regard to social capital and opportunity, admissions committees on average give preference to those with stellar examination scores and grades over mid-tier metrics. As renowned Brown University literature scholar Arnold Weinstein says, students at schools like his own are admitted “on the strength of their intelligence, not their virtue.”² Yet in medical education, where the same norms hold true, virtue—as well as compassion, collegiality, and flexibility—may prove far more valuable traits than raw intellect.

Criticism of intelligence-based assessment has tended to be oblique. Since the 1980s, advocates for admissions reform have noted that personality and motivation play a substantially greater role in medical school performance than traditional measures of intelligence.³ These findings led to calls for the use of personality testing in the admissions process.⁴ More recently, drawing upon developmental psychologist Howard Gardner’s theory of multiple intelligences, skeptics of traditional metrics have advocated for situational judgment tests that assess interpersonal skills.^{5,6,7} Unfortunately, these tools come with their own burdens and biases.⁸ Closely related are proposals that emphasize screening out applicants who lack the social and communication abilities necessary to practice medicine.⁹ Another approach has been to

question the individual admissions requirements, such as MCATs and science sequences, but without challenging the intelligence-related assumptions underlying their use.¹⁰ What these critiques have in common is a desire to supplement assessments based on intelligence, rather than supplant them entirely. These arguments appear radical or transformative only within a highly circumscribed and hidebound context. In his controversial essay, “Legal Education and the Reproduction of Hierarchy,” Harvard Law Professor Duncan Kennedy proposed that law school slots should be raffled off among all applicants who could meet baseline academic standards, but advocacy for such radical democratization has been largely absent from debates surrounding medical school admissions criteria.¹¹

This paper argues that using intellectual abilities as an assessment tool for medical school admissions, beyond the level of cognition required to complete coursework and practice medicine skillfully, is both unjust to applicants and runs contrary to the interests and wishes of patients. That is not to say that rigorous criteria should not be used for admission into a profession charged with caring for the health and welfare of strangers. Nothing in this paper is meant to echo the reasoning of former Nebraska Senator Roman Hruska, who gained ignominy for arguing that “mediocre” people were entitled to be represented by similar mediocrities on the United States Supreme Court.¹² Nor is this approach intended to guard the pathways to medical education like a modern-day Madame Defarge, preventing entry to individuals who do score well on traditional measures of intelligence from pursuing medical careers solely because of their intellects. Most importantly, this paper is not arguing that some baseline intelligence should not be required for matriculation nor it is an attempt to open a backdoor for admission to those candidates who embrace ideas contrary to the fundamental tenets of science and allopathic medicine. Rather, this paper calls for a fundamental reimagining of what it means to be a mediocre applicant versus an outstanding one. What follows is an argument that, once sufficient intelligence to practice medicine is ascertained, any additional cognitive advantage should not—with few exceptions—play a determinative role in the medical school admissions process.

Metrics Versus Intelligence

Social scientists have noted a significant correlation between intelligence and both high school and college grades in the United States since the 1920s.¹³ More recently, significant correlations have been reported between intelligence and standardized test scores on such examinations as SATs and ACTs.¹⁴ That is not to say that the sorts of intelligence being measured are the kinds most useful for the practice of medicine. As Emanuel and Gudbranson have pointed out, “Knowing how to calculate the speed of a ball rolling down an inclined plane or recalling the Bamford–Stevens reaction are totally irrelevant to being an astute diagnostician.”¹⁵ Nor do these metrics reflect *only* intelligence. Rather, even among applicants with similar degrees of economic and social capital, metrics (grades and standardized test scores) are a measure of various factors, including effort and so-called test-taking abilities. As noted above, among individuals with differing levels of economic and social capital, metrics are clearly not effective measures of intellect. What matters is that admissions committees largely *use* metrics as surrogates for intelligence. Of course, some geniuses may produce poor metrics, whereas those of lesser cognitive skills may harness diligence and drive to achieve higher grades and scores, but the particular kind of intelligence measured by these grades and scores on average will prove higher in those with higher levels of that particular variety of intelligence. Should schools measure the other factors that influence metrics (among those similarly situated by economic and social capital)—such as drive or commitment to medicine—schools have numerous other, more precise tools for doing so: requiring volunteer clinical hours, for instance, to display dedication. The fact that schools continue to rely upon metrics suggests that they value the component of metrics that they believe to reflect intelligence.

Fairness to Applicants

Considerable disagreement exists over the meaning of fairness in medical school admissions. This paper proposes a very broad definition: Fair admissions standards are those that do not penalize applicants for characteristics that are neither necessary for the effective practice of medicine nor beyond their control to

modify. Some implications of this definition are readily apparent. First, this approach creates an opportunity for the meaningful evaluation of URiM and lower-income applicants who do not have it within their power to alter the structural and systemic biases that may limit opportunities to enhance their applications. Second, it allows for rational discrimination in circumstances where a particular applicant does not possess a characteristic or ability that would be essential for him to provide care to patients. For instance, an individual with a track record of dishonesty might not display the requisite ability or willingness to comply with the ethical standards of the profession. The question is whether, and to what extent, using intelligence in admissions conforms to this standard of fairness.

Intelligence, however, it is measured, varies considerably among individuals, and high concordance exists between different forms of intelligence.^{16-17,18} A significant portion of cognitive variance, likely more than 50 percent among adults, stems from genetic factors.^{19,20} Genetic proclivities for intelligence are not randomly distributed. Long before psychologists had quantified the genetic basis of intelligence, common wisdom recognized that smart parents were prone to have smart children. Assortative mating exacerbates this phenomenon.²¹ At present, viable mechanisms do not exist for the modification of the genetic components of intelligence. Moreover, the highly polygenic nature of intelligence suggests that efforts to enhance intelligence through gene editing, even if deemed ethical, are likely a long way off.²² In other words, individuals born with lower intelligence may be limited in their ability to augment that intelligence, even if afforded ample or unlimited resources. It should be emphasized that nothing in this paper is intended to suggest genetic differences in intelligence between racial, ethnic, or socioeconomic groups. Rather, the point here is to argue that among applicants who have had similar opportunities in life, possess similar degrees of social capital and are endowed with the same privileges, intelligence is still likely to vary through no faults or choices of their own. Grades and MCAT scores are often used as proxies for intelligence. Although they are extremely poor proxies for comparing intelligence between differently situated applicants, they likely have some value for the limited purpose of assessing particular types of intelligence between similarly situated applicants. Of course, motivation, mental health, and a range of other variables may also shape an applicant's metrics. However, when comparing two applicants of similar backgrounds from the same upscale suburb and Ivy League college, these metrics probably do correlate with the forms of intelligence that they are designed to assess. Whether those forms of intelligence are relevant to the practice of high-quality medicine is an entirely different matter.

If intelligence is largely beyond the control of applicants to modify, the next question is whether it is necessary for the effective practice of medicine. Historically, the assumption has been affirmative. One recent study estimated the average IQ of American physicians at 120, substantially higher than any other occupation assessed.²³ Yet it would be a grave error to conflate the familiar with the necessary. The ranges for grades and MCAT scores at which students perform poorly in medical school or on licensing exams stand far lower than those at which acceptance at a top-tier medical school proves unrealistic, certainly for the upper-middle class Ivy League applicant from an advantaged background competing with similarly situated applicants who produce higher metrics. No meaningful data exist on whether these differences in metrics affect clinical skills. In other words, no evidence indicates that a B student with an MCAT score of 510 will prove less able to meet the needs of patients than an A student with an MCAT score of 520, all other factors being equal, yet the latter is given a considerable advantage in the admissions process. By the definition proposed above, that approach is highly unfair. At the same time, concerns of this nature are all too easy to dismiss or laugh off—unless one is a medical school applicant of slightly below average intelligence and mid-tier metrics, but an enormous heart and a deep empathy for one's fellow human beings, who is denied admission to American medical schools based upon grades and scores. A just approach would determine precisely what levels of intelligence (whether measured by current metrics or some other means) are necessary for quality medical practice and not consider variations above this threshold in the admissions process.

One might argue that while intelligence is not essential, increased intelligence might prove beneficial at the margins. In some cases, added intelligence could add to insights, better diagnostic skills or even a life-saving realization. But in the absence of evidence, that argument is purely speculative and must be weighed against the demonstrable injustice of judging applicants on an unmodifiable characteristic that has no clear bearing on the work of physicians.

Interests of Patients and Society

The second problem with using intelligence, or its surrogates, as a driving factor in admissions decisions is that it does not serve the wishes or interests of patients. Studies across multiple nations show that doctors rate “medical competence” and “ethics” as “the most important” qualities for their profession, whereas interpersonal and communication skills are “much less valued.”²⁴ This differs from patients, who place considerable emphasis on additional factors like interpersonal competence.²⁵ That is not to say that patients do not value competence, because they do, but that it is one among many attributes that they consider important. But competence is not synonymous with intelligence. In fact, intelligence is not even listed as a choice in most surveys of patient preferences. Like the man in the children’s joke whose legs are just long enough to reach the ground, the competent doctor may be just smart enough to do the job. So while grandparents may claim—like the author’s own once did—that their progeny are so smart that they should be doctors, those same grandparents likely prefer good listening skills or compassion to surplus intellect when visiting their own internists. When it comes to future physicians, “the best” and “the brightest” have limited overlap, and whom society chooses to *become* a physician differs considerably from whom society wants to *be* a physician. Even the perception that high intelligence is a requirement for admission into the medical field may be detrimental to patient and societal welfare—scaring away potential applicants of considerable empathy and generosity of spirit who are unable to notch perfect metrics.

Some patients may want a doctor of extraordinary intelligence, a gifted intellectual who quotes Shakespeare, speaks Attic Greek and Old Norse with equal fluency and has translated Toni Morrison’s novels into Sanskrit. Yet such patients are likely few and represent one among many idiosyncratic preferences. A patient might easily prefer a good-looking physician, yet no medical school uses conformity with popular norms of physical attractiveness as a standard for admissions—nor should any. In his controversial essay, “Doctor Talk to Me,” the late literary critic Anatole Broyard wrote of turning “irrevocably against” a urologist who wore his surgical cap “without inflection or style,” but “like an American in France who affects a beret without understanding how to shape or cock it.”²⁶ Distinguishing applicants of sufficiently elevated and extremely high intelligence, to meet the preferences of a small subset of patients, seems no more reasonable than admitting applicants based on how well they wear their hospital regalia.

Extreme intellect might be of considerable value for a few specific positions requiring a medical degree. Certain forms of research, for example, may require levels of acumen and original thinking that far exceed those needed to provide quality patient care. To address this need, a case can be made for admitting a small percentage of applicants based on intellect. However, such standards for *all* applicants, when they are only necessary for a few, seem like a poor trade-off, as illogical as admitting only students with superlative manual dexterity because some applicants will seek careers in surgery.

Solutions

A detailed plan for various ways in which the rule of intelligence can be appropriately curtailed in the admissions process is beyond the scope of this paper. What follows are two broad proposals that would make significant headway in achieving this goal.

Blinding for Surplus Metrics

Certain grades and MCAT scores may place an applicant at high risk of either failure in medical school or an inability to practice medicine at a level of sufficient quality to meet patient needs. In a blinded system, medical school admissions offices would screen out such applications in advance. All other applicants would be interviewed and evaluated based on their other attributes with their metrics hidden—except that the evaluators and admissions committee would know from the screening process that these figures were deemed high enough for them to succeed in medical school and the profession. One might carve out space for unblinding in cases where metrics are of concern, but other attributes might yet justify such an

actuarial risk. However, among applicants of clear intellectual sufficiency, differences in metrics would not factor in the admissions process. The result might be so-called top-tier medical schools seeing lower average GPAs and MCAT scores, but classes at these schools are filled with applicants who possess the talents most necessary for success in medicine.

Increase Slots

Every year, the number of applicants to medical school far exceeds the number of seats available—and many of these rejected applicants would likely complete medical school successfully and become first-rate physicians. The stated purpose of such size limits is to keep quality high, but keeping reimbursement elevated is clearly also a driving force. Rather than driving qualified applicants to medical schools abroad, or from the ranks of aspiring doctors entirely, increasing vastly the number of seats in medical schools and residency programs so that any capable applicant could practice medicine in the United States would likely eliminate the need to rely on excess intelligence in the admissions process. Lowering reimbursement, one might argue, could dissuade applicants, who might then favor careers in other STEM fields. Fortunately, as long as only individuals capable of practicing quality medicine are admitted, patients are unlikely to see any detrimental changes to care. In fact, they might receive better care as those applicants motivated by reimbursement are replaced by others, just as competent, motivated by compassion for their fellow human beings.

Conclusions

American society is currently engaged in a transformative process where irrelevant and irrational criteria are being removed as barriers to advancement. Some of these unjustified prejudices—those based on race, gender, sexual orientation, and so forth—are readily apparent. However, other, more subtle forms of irrational bias are deeply embedded in our society in ways that impede meaningful equality, often so deep that they go unrecognized. The privileging of intelligence where it is not relevant is one such example. Using surplus intelligence in admissions criteria creates the false appearance of meritocracy, when the reality is that the attributes being favored offer no additional merit and often do not reflect desirable values, but desirable genes. The result is a pool of physicians who are too smart for our own good, when instead society might produce physicians who are sufficiently smart and more ethical, more empathetic, or more devoted.

Medical schools, needless to say, are not alone in privileging intelligence in areas where doing so is ornamental rather than essential. The arguments offered in this paper are generalizable to other areas in medicine, education, and beyond. Intelligence has its place in society—but so do good looks, height, and physical agility; using any of these factors in the wrong setting, or relying upon them excessively when not necessary, is a grave and invisible injustice.

Notes

1. Holistic Review; 2021; available at <https://www.aamc.org/initiatives/holisticreview/about/> (last accessed 20 Jan 2023).
2. Great Courses and Professor Arnold Weinstein Gets His Essay 37 Years Later; 2021; available at <https://talkerofthetown.com/2020/12/28/36-years-later-professor-arnold-weinstein-gets-his-essay/> (last accessed 20 Jan 2023).
3. Walton HJ. Personality assessment of future doctors: Discussion paper. *Journal of the Royal Society of Medicine* 1987;**80**(1):27–30.
4. See note 3, Walton 1987.
5. Gardner H. The theory of multiple intelligences. *Annals of Dyslexia* 1987;**37**(1):19–35.
6. Lievens F. Adjusting medical school admission: Assessing interpersonal skills using situational judgement tests. *Medical Education* 2013;**47**(2):182–9.

7. Patterson F, Zibarras L, Ashworth V. Situational judgement tests in medical education and training: Research, theory and practice: AMEE Guide No. 100. *Medical Teacher* 2016;**38**(1):3–17.
8. New Admission Test Flawed, Won't Produce Better Doctors; 2021; available at <https://www.medscape.com/viewarticle/924833> (last accessed 20 Jan 2023).
9. Powis D. Selecting medical students: An unresolved challenge. *Medical Teacher* 2015;**37**(3):252–60.
10. Appel JM. Medical school: The wrong applicant pool? *Hastings Center Report* 2019;**49**(2):6–8.
11. Kennedy D. Legal education and the reproduction of hierarchy. *Journal of Legal Education* 1982;**32**(4):591–615.
12. Hohan WH. Roman L. Hruska dies at 94; leading senate conservative. *The New York Times* 1999 Apr 27.
13. Harris D. Factors affecting college grades: A review of the literature, 1930–1937. *Psychological Bulletin* 1940;**37**(3):125–66.
14. Frey MC. What we know, are still getting wrong, and have yet to learn about the relationships among the SAT, intelligence and achievement. *Journal of Intelligence* 2019;**7**(4):26.
15. Emanuel EJ, Gudbranson E. Does medicine overemphasize IQ? *JAMA* 2018;**319**(7):651–2.
16. Gray ME, Holyoak KJ. Individual differences in relational reasoning. *Memory & Cognition* 2020;**48**(1):96–110.
17. Plomin R, Deary IJ. Genetics and intelligence differences: Five special findings. *Molecular Psychiatry* 2015;**20**(1):98–108.
18. Sternberg RJ. Intelligence. *Dialogues in Clinical Neuroscience* 2012;**14**(1):19–27.
19. Finkel D, Pedersen NL, McGue M, McClearn GE. Heritability of cognitive abilities in adult twins: comparison of Minnesota and Swedish data. *Behav Genet.* 1995;**25**(5):421–431.
20. Houdé O. Beyond IQ comparisons: intra-individual training differences. *Nat Rev Neurosci.* 2010;**11**(5):370.
21. See [note 17](#), Plomin 2015.
22. Davies G, Tenesa A, Payton A, Yang J, Harris SE, Liewald D, et al. Genome-wide association studies establish that human intelligence is highly heritable and polygenic. *Molecular Psychiatry* 2011;**16**(10):996–1005.
23. Hauser RM. *Meritocracy, Cognitive Ability, and the Sources of Occupational Success*. CDE Working Paper No. 98-07. Madison: Center for Demography and Ecology, University of Wisconsin-Madison; 2020.
24. Steiner-Hofbauer V, Schrank B, Holzinger, A. What is a good doctor? *Wiener Medizinische Wochenschrift* 2018;**168**:398–405.
25. See [note 24](#), Steiner-Hofbauer et al. 2018.
26. Broyard A. Doctor talk to me. *New York Times* 1990 Aug 26.