

Annotated Selected Readings

The following reading list is designed to alert readers to a selection of articles and resources relevant to developing and implementing holistic review. The list is not intended to be comprehensive, but rather a starting place for individuals interested in learning more. The annotations included in this bibliography are drawn from the published article abstracts.

General

Steinecke, A., Boudreau, J., Bletzinger, R.B., Terrell, C. (2007) Race-Neutral Admission Approaches: Challenges and Opportunities for Medical Schools. *Academic Medicine* 82 (2): 117-126.

In 2003, the U.S. Supreme Court's rulings in *Grutter v. Bollinger* and *Gratz v. Bollinger* affirmed the use of narrowly tailored race-conscious admission programs by institutions of higher education that find that the benefits derived from diversity rise to a compelling interest. The rulings also required institutions that use race-conscious admission programs to explore whether the results of such programs could be met through race-neutral alternatives. In this article, the authors review relevant literature in the context of medical education and summarize the existing information about race-neutral alternatives and the challenges and opportunities in implementing them, with the goal of encouraging further research that will inform medical school admission policies.

The authors argue that although undergraduate and graduate institutions across the nation are pursuing the goal of diversity within the guidelines set forth by the Court, there is too little known about how race-neutral alternatives to race-conscious admission policies can be effective in promoting diversity. They conclude that although certain approaches show promise, medical schools—as they continue to employ race-conscious admission policies to achieve the benefits of diversity—must take advantage of their compliance with the Court's decision to investigate whether race-neutral approaches can contribute to the diversity of medical school classes.

Admissions Model

Edwards, J.C., Elam, C.L., Wagoner, N.E. (2001) An Admission Model for Medical Schools. *Academic Medicine* 76 (12): 1207-1212.

Complex societal issues affect medical education and thus require new approaches from medical school admission officers. One of these issues—the recognition that the attributes of good doctors include character qualities such as compassion, altruism, respect, and integrity—has resulted in the recent focus on the greater use of qualitative variables, such as those just stated, for selecting candidates. In addition, more emphasis is now being placed on teaching and licensure testing of the attributes of the profession during the four-year curriculum. The second and more contentious issue concerns the system used to admit white and minority applicants. Emphasizing character qualities of physicians in the admission criteria and selection process involves a paradigm shift that could serve to resolve both issues.

To make this or any paradigm shift in admission policy, medical schools must think about all the elements of admission and their interrelationships. A model of medical school admission is proposed that can provide understanding of the admission system and serve as a heuristic guide. This model consists of (1) the applicant pool; (2) criteria for selection; (3) the admission committee; (4) selection processes and policies; and (5) outcomes. Each of these dimensions and

the interrelationship among the dimensions are described. Finally, a hypothetical example is provided in which the model is used to help a medical school change its admission process to accommodate a new emphasis in the school's mission.

Evaluating Applicants

Albanese, M.A., Farrell, P., Dottl, S.L. (2005) A Comparison of Statistical Criteria for Setting Optimally Discriminating MCAT and GPA Thresholds in Medical School Admissions. *Teaching and Learning in Medicine* 17 (2): 149-158.

Background: Using Medical College Admission Test-grade point average (MCAT-GPA) scores as a threshold has the potential to address issues raised in recent Supreme Court cases, but it introduces complicated methodological issues for medical school admissions. **Purpose:** To assess various statistical indexes to determine optimally discriminating thresholds for MCAT-GPA scores. **Methods:** Entering classes from 1992 through 1998 (N = 752) are used to develop guidelines for cut scores that optimize discrimination between students who pass and do not pass the United States Medical Licensing Examination (USMLE) Step 1 on the first attempt. **Results:** Risk differences, odds ratios, sensitivity, and specificity discriminated best for setting thresholds. Compensatory versus noncompensatory procedures both accounted for 54% of Step 1 failures, but demanded different performance requirements (noncompensatory MCAT-biological sciences = 8, physical sciences = 7, verbal reasoning = 7—sum of scores = 22; compensatory MCAT total = 24). **Conclusions:** Rational and defensible intellectual achievement thresholds that are likely to comply with recent Supreme Court decisions can be set from MCAT scores and GPAs.

Albanese, M.A., Snow, M.H., Skochelak, S.E., Huggett, K.N., & Farrell, P.M. (2003). Assessing Personal Qualities in Medical School Admissions. *Academic Medicine* 78 (3): 313-321.

The authors analyze the challenges to using academic measures (MCAT scores and GPAs) as thresholds for admissions and, for applicants exceeding the threshold, using personal qualities for admission decisions; review the literature on using the medical school interview and other admission data to assess personal qualities of applicants; identify challenges of developing better methods of assessing personal qualities; and propose a unified system for assessment. The authors discuss three challenges to using the threshold approach: institutional self-interest, inertia, and philosophical and historical factors. The challenges to developing better personal quality measures include selecting and operationally defining the most important qualities, measuring the qualities in a cost-effective manner, and overcoming "cunning" adversaries who, with the incentive and resourcefulness, can potentially invalidate such measures. The authors discuss potential methods of measuring personal qualities and propose a unified system of assessment that would pool resources from certification and recertification efforts to develop competencies across the continuum with a dynamic, integrated approach to assessment.

Chamberlain, S.E., Searle, J. (2005) Assessing Suitability for Problem-based Learning Curriculum: Evaluation of a New Student Selection Instrument. *Medical Education* 39: 250-257.

Context: A new student selection instrument has been designed to assess candidate suitability for a problem-based learning, small group curriculum. **Objective:** To evaluate the performance of the new teamwork selection instrument in terms of its discriminatory power, fairness, validity, reliability, and acceptability among candidates. **Sample:** A sample of 69 volunteer candidates attending for interviews formed 13 teams of 5 or 6 candidates each. Each candidate was assessed independently by 2 assessors. Candidate performance in the exercise was used for instrument evaluation purposes only. **Results:** The instrument demonstrated good item discrimination (item-total correlations $r =$ between 0.75 and 0.83, $P < 0.01$); the potential for good agreement between raters (63% agreement, weighted kappa = 0.38, $P < 0.01$); strong internal consistency reliability (Cronbach's $\alpha = 0.93$), and good acceptability among candidates. No sources of assessment bias were identified on the basis of candidates' age (univariate ANOVA $F = 0.43$, $P > 0.05$), gender (unrelated samples t -test $F = 1.2$, $P > 0.05$) or socioeconomic background (univariate ANOVA $F = 0.85$, $P > 0.05$). There was no statistically significant relationship between the candidates' performance in the new exercise and their performance in the standardized formal interview ($r = -0.37$, $P > 0.05$); the instrument had limited predictive validity, and some of the measured attributes require conceptual clarification. **Discussion:** Statistical and conceptual analysis highlights the scope for development in the teamwork exercise. The exercise appears to be well suited to assessing candidate suitability for a problem-based learning curriculum.

Kleshinski, J., Shriner, C., Khuder, S.A. (2008) The Use of Professionalism Scenarios in the Medical School Interview Process: Faculty and Interviewee Perceptions. *Medical Education Online* 13 (2); available from <http://www.med-ed-online.org>.

Purpose: The purpose of this study was to determine the impact of professionalism scenarios on the medical school admission process from applicant and faculty perspectives. Specifically, do completing professionalism scenarios as part of the medical school interview process have an impact on both the interviewee's and the faculty's perception of the process and outcome? **Method:** Ninety-one faculty interviewed 199 applicants from January 2007 through April 2007 at The University of Toledo College of Medicine. All applicants were asked one standard professionalism scenario in each of their two interviews. A total of six scenarios were used for the entire interviewing season in rotation every two months. A survey was administered by an admissions office staff member to both the interviewed applicants as well as faculty who conducted interviews about how these scenarios impacted their interview experience. **Results:** Asking applicants to respond to professionalism scenarios during the interview was described as having a positive influence on their interview experience. This was also associated with leaving an impression on the applicant about what our institution values in its students and contributed an element of personal reflection about what will be expected of them in the medical profession. Applicants more often reported that asking questions about professionalism was an important aspect of the interview than did faculty. Overall, there was an association between the interviewer's perception of the applicant's response and the interviewer's assessment of professionalism. **Conclusions:** Professionalism scenarios can be a worthwhile tool for use in the admissions process. The interview process should encourage participation from faculty who value this as an important component in the evaluation of an applicant. Determinants of faculty perception of the role of assessing professionalism in the interview process should be investigated in future research.

Kreiter, C.D., Solow, C., Brennan, R.L., Yin, P., Ferguson, K., Huebner, K. (2006) Examining the Influence of Using Same Versus Different Questions on the Reliability of the Medical School Preadmission Interview. *Teaching and Learning in Medicine* 18 (1): 4-8.

Background: Researchers generally recommend a structured format for the medical school preadmission interview (MSPI). However, the relative benefits of various elements of structure remain unexamined. **Purpose:** In this study, we compared the performance of a highly structured interview format with a semistructured format. Specifically, we examined how the reliability of interview ratings is likely to change when using the same versus different questions for each applicant being interviewed. **Method:** Variance components from a generalizability (G) study of a structured interview are used in decision studies to compare the relative efficacy of using the same versus different questions for each applicant. **Results:** Using different questions for each interviewee is practically as reliable as using the same questions for all applicants ($G = .55$ vs. $.57$, respectively). **Conclusions:** Because there are a number of drawbacks to using the same questions for all applicants (i.e., security and validity) and little advantage in terms of increased reliability, the semistructured question format should be considered when conducting the MSPI. A suggested method of implementing a semistructured interview is by presenting each applicant a set of questions randomly drawn from a pool of interview questions.

Patrick, L.E., Altmaier, E.M., Kuperman, S., Ugolini, K. (2001) A Structured Interview for Medical School Admission, Phase 1: Initial Procedure and Results. *Academic Medicine* 76 (1): 66-71.

Purpose: Despite their widespread use, medical school admission interviews often are unstructured and lack reliability. This report describes the development of a structured admission interview designed to eliminate bias and provide valid information for selecting medical students, with preliminary information about the interviews reliability and validity. **Method:** After screening application, 490 applicants to a public medical school residency program were interviewed by two faculty members using a structured interview format. Interview scores were compiled and correlated with undergraduate grade-point averages (GPAs); Medical College Admission Test (MCAT) scores; Iowa Evaluation Form (IEF) scores, an in-house evaluation of applicants' noncognitive abilities; and eventual admission status. **Results:** Inter-rater agreement was good; the percentages of rater pairs whose scores differed by one point or less ranged from 87% to 98%. Scores on the structured interview revealed low to moderate correlations with other admission criteria: $.10$ ($p < .05$) for cumulative GPA, $.18$ ($p < .01$) for MCAT Biological Science, $.08$ ($p > .05$) MCAT Physical Science, and $.10$ ($p < .05$) MCAT Verbal Reasoning. None of the correlations between the overall interview scores and the IEF scores reached statistical significance ($p = .05$). Higher overall scores on the structured interview did predict a greater likelihood of being accepted into the medical school and the interview score accounted for 20% of the incremental variance in admission status beyond GPA, MCAT, and IEF scores. **Conclusions:** The moderate-to-low correlations with other admission criteria suggest that the interview provided information about candidate credentials not obtained from other sources and accounted for a substantial portion of the variance in admission status. This finding supports the considerable time and resources required to develop a structured interview for medical student admissions. Final judgment on the validity and utility of this interview should be made after follow-up performance data have been obtained and analyzed.

White, C.B., Dey, E.L., Fantone, J.C. (2007) Analysis of Factors that Predict Clinical Performance in Medical School. *Advances in Health Sciences Education*, Published online 21 November 2007.

Academic achievement indices including GPAs and MCAT scores are used to predict the spectrum of medical student academic performance types. However, use of these measures ignores two changes influencing medical school admissions: student diversity and affirmative action, and an increased focus on communication skills, to determine if GPA and MCAT predict performance in medical school consistently across students, and whether either predicts clinical performance in clerkships. A path model was developed to examine relationships among indices of medical student performance during the first three years of medical school for five cohorts of medical students. A structural equation approach was used to calculate the coefficients hypothesized in the model for majority and minority students. Significant differences between majority and minority students were observed. MCAT scores, for example, did not predict performance of minority students in the first year of medical school but did predict performance of majority students. This information may be of use to medical school admission and resident selection committees.

Educational and Healthcare Benefits of Diversity

Guiton, G., Chang, M.J., Wilkerson, L. (2007) Student Body Diversity: Relationship to Medical Students' Experiences and Attitudes. *Academic Medicine* 82 (10 Suppl): S85-S88.

Background: Multiple studies of undergraduate college students have demonstrated the effects of cross-cultural interaction and exposure to diverse ideas on a variety of educational outcomes. The current study was designed to extend this work into medical education, examining student body diversity and school-supported cross-cultural experiences on students' attitudes about diversity. **Method:** Four-hundred forty-one rising fourth-year medical students from three schools with differing levels of student body diversity completed a 55-item questionnaire on their background, experiences, and attitudes related to cross-cultural diversity. **Results:** Medical students' attitudes about culture and health and their perspectives on societal issues related to diversity were influenced by their medical school experiences. Informal instructional interactions seem to have been most influential in shaping these beliefs. **Discussion:** The opportunity for students from diverse backgrounds to interact as part of the curriculum is an important means of promoting positive attitudes toward diversity in educational and social environments.

Saha, S., Guiton, G., Wimmers, P.F., et al. (2008). Student Body Racial and Ethnic Composition and Diversity-Related Outcomes in US Medical Schools. *JAMA* 300 (10): 1135-1145.

Context: Many medical schools assert that a racially and ethnically diverse student body is an important element in educating physicians to meet the needs of a diverse society. However, there is limited evidence addressing the educational effects of student body racial diversity. **Objective:** To determine whether student body racial and ethnic diversity is associated with diversity-related outcomes among US medical students. **Design, Setting, and Participants:** a Web-based survey (Graduation Questionnaire) administered by the Association of American Medical Colleges of 20,112 graduating medical students (64% of all graduating students in 2003 and 2004) from 118 allopathic medical schools in the United States. Historically black and Puerto Rican medical schools were excluded. **Main Outcome Measure:** Students' self-rated preparedness to care for patients from other racial and ethnic backgrounds, attitudes about equity and access to care, and intent to practice in an underserved area. **Results:** White students within the highest quintile for student body racial and ethnic diversity, measured by the proportion of underrepresented minority (URM) students, were more likely to rate themselves as highly prepared to care for minority populations than those in the lowest diversity quintile (61.1% vs 53.9%, respectively; $P < 0.001$; adjusted odds ratio [OR], 1.33; 95% confidence interval [CI], 1.13-1.57). This association was strongest in schools in which students perceived a positive climate for interracial interaction. White students in the highest URM quintile were also more likely to have strong attitudes endorsing equitable access to care (54.8% vs 44.2%, respectively; $P < 0.001$; adjusted OR, 1.43; 95% CI, 1.15-1.74). For nonwhite students, after adjustment there were no significant associates between student body URM proportions and diversity-related outcomes. Student body URM proportions were not associated with white or nonwhite students' plans to practice in underserved communities, although URM students were substantially more likely than white or nonwhite/non-URM students to plan to serve the underserved (48.7% vs 18.8% vs 16.2% respectively; $P < 0.001$). **Conclusion:** Student body racial and ethnic diversity within US medical schools is associated with outcomes consistent with the goal of preparing students to meet the needs of a diverse population.

Saha, S., Shipman, S.A. (2008) Race-Neutral Versus Race-Conscious Workforce Policy to Improve Access to Health Care.” *Health Affairs* 27 (1): 234-245.

Access to care for racial and ethnic minority groups, low-income populations, and the underinsured has been problematic despite expansion in the health workforce. Workforce policies that improve access to care are needed, as is funding to support them. Reviewing evidence related to providers' patterns of service to the underserved, this paper concludes that underrepresented minority health professionals have consistently been more likely than those from low, socioeconomic backgrounds or the National Health Service Corps to deliver health care to the underserved. These findings have implications for policies and programs that might leverage the workforce to better meet the needs of disadvantaged patients.

Whitla, D.K., Orfield, G., Silen, W., Teperow, C., Howard, C., Reede, J. (2003) Educational Benefits of Diversity in Medical School: A Survey of Students. *Academic Medicine* 78 (5): 460-466.

Purpose: Many U.S. medical schools have abandoned affirmative action, limiting the recruitment and reducing the admission of underrepresented minority (URM) students even though research supports the premise that the public benefits from an increase in URM physicians and that URM physicians are likely to serve minority, poor, and Medicaid populations. Faculty and students commonly assume they benefit from peer cultural exchange, and the published evidence for the past two decades supports this notion. This research examined the students' perceptions of the educational merits of a diverse student body by surveying medical students at two schools. **Method:** In 2000, medical students from all four years at Harvard Medical School and the University of California, San Francisco, School of Medicine were enrolled in a telephone survey about the relevance of racial diversity (among students) in their medical education. Students responded to the interviewer's questions on a five-point Likert-type scale. **Results:** Of the 55% of students who could be located, 97% responded to the survey. Students reported having little intercultural contact during their formative years but significantly more interactions during higher education years, especially in medical school. Students reported contacts with diverse peers greatly enhanced their educational experience. They strongly supported strengthening or maintaining current affirmative action policies in admissions. The responses and demography of the Harvard and UCSF students did not differ significantly, nor did they differ for majority students and URM students—all groups overwhelmingly thought that racial and ethnic diversity among their peers enhanced their education. **Conclusions:** Diversity in the student body enhanced the educational experiences of students in two U.S. medical schools.

University of Michigan Admissions Lawsuits Web site:

<http://www.vpcomm.umich.edu/admissions/>.

This Web site includes an FAQ section and legal overview of the cases, as well as the research reports documenting the educational benefits of a diverse student body.

College Board Publications

Coleman, A.L., Palmer, S.R. Admissions and Diversity After Michigan: The Next Generation of Legal and Policy Issues. College Board, 2006. Available online:

http://www.collegeboard.com/prod_downloads/diversitycollaborative/acc-div_next-generation.pdf

Coleman, A.L., Palmer, S.R., Richards, F.S. *Federal Law and Recruitment, Outreach, and Retention: A Framework for Evaluating Diversity-Related Programs*. College Board, 2005. Available online: http://www.collegeboard.com/prod_downloads/diversitycollaborative/05diversity-fedlaw-framework.pdf (div/retention)

Coleman, A.L., Palmer, S.R., Richards, F.S. *Federal Law and Financial Aid: A Framework for Evaluating Diversity-Related Programs*. College Board, 2005. Available online: http://www.collegeboard.com/prod_downloads/diversitycollaborative/diversity_manual.pdf (financial aid)

Coleman, A.L., Palmer, S.R., Sanghavi, E., Winnick, S. *From Federal Law to State Voter Initiatives: Preserving Higher Education's Authority to Achieve the Educational, Economic, Civic, and Security Benefits Associated with a Diverse Student Body.* College Board, 2007. Available online: http://www.collegeboard.com/prod_downloads/diversitycollaborative/preserving-higher-education-authority.pdf (voter initiatives)

Perfetto, G., Escandón, M., Graff, S., Rigol, G., Schmidt, A. *Toward a Taxonomy of the Admissions Decision-Making Process: A Public Document on the First and Second College Board Conferences on Admissions Models.* College Board, 1999.

Rigol, G. *Best Practices in Admissions Decisions: A Report on the Third College Board Conference on Admission Models.* College Board, 2002.

Rigol, G. *Admissions Decision-Making Models: How U.S. Institutions of Higher Education Select Undergraduate Students.* College Board, 2003.

Rigol, G.W. *Selection Through Individualized Review: A Report on Phase IV of the Admissions Models Project.* College Board, 2004.