

MCAT Revision Anticipates Psychological Science

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Two years from now, in the spring of 2015, a new Medical College Admission Test (MCAT) will be released. This will be the fifth time the MCAT has undergone a major revision since it was first administered in 1928. Each revision of the MCAT provides a window into what is considered to be appropriate academic preparation for medical school. Recent versions have placed a relatively strong emphasis on understanding and working with scientific data (McGaghie, 2002). The 2015 MCAT will be noted for the addition of a new subtest on the behavioral and social sciences.

The current MCAT is a computer-based, standardized, multiple-choice test of science knowledge, problem solving, and critical reasoning. It reports scores in physical sciences, biological sciences, and verbal reasoning (a scored writing sample is being phased out). Administered almost 90,000 times in 2012, the MCAT weighs heavily in medical school admission decisions, partly because it is predictive of medical school grades and the United States Medical Licensing Examination Step scores (Julian, 2005).

Major advances in the biomedical sciences have occurred since the current version of the MCAT was introduced in 1991. Although the science content is updated periodically between revisions, the new MCAT signals significant shifts in premedical preparation. For example, in rankings of the importance of scientific disciplines for the study of medicine, biochemistry received the highest average rating in a survey of medical schools (Association of American Medical Colleges, 2011a). In order to reflect this development, the new MCAT will now require knowledge of biochemistry. The new MCAT must also anticipate future developments in medical school curricula, since it is expected to be in place for the next 15 years. Medical school curricula incorporating behavioral and social determinants of health and well-being are increasingly being developed, and the 2015 MCAT will measure students' preparation for this important material.

In 2008, the Association of American Medical Colleges (AAMC) appointed a 21-member committee of deans of medical schools; officers of admission, educational affairs, student affairs, and diversity; basic and clinical science faculty, pre-health advisors, and other baccalaureate faculty; a resident; and a medical student to make recommendations about the fifth revision of the MCAT. The MR5 Committee, as it was called, solicited input from blue-ribbon panels such as the AAMC–Howard Hughes Medical

Institute Scientific Foundations for Future Physicians Committee (2009), the AAMC Behavioral and Social Sciences Expert Panel (2011b), and others. In addition, the MR5 received surveys from baccalaureate and medical school faculty, administrators, residents, and medical students and solicited input at more than 90 outreach events. In early 2012, the MR5 released its recommendations, including the development of a new subtest called the Psychological, Social, and Biological Foundations of Behavior (PSBB).

The New Psychological, Social, and Biological Foundations of Behavior Subtest

Testing of material in the behavioral and social sciences is not new to the MCAT. The most significant change during the first revision of the MCAT in 1946 was the addition of a section called “Understanding Modern Society.” This section included content from the fields of history, economics, government, and sociology, reflecting a desire within the medical school community to seek students with a broad liberal arts background. In general, medical school admission committees did not consider scores of general knowledge to be of great importance in admission decisions (Glaser, 1957), and by the third revision of the MCAT, testing broader knowledge across the liberal arts was dropped in favor of measuring science knowledge, scientific problem solving, and quantitative and reading skills. If future medical admissions committees also ignore scores on the new PSBB subtest, it may suffer the same fate as earlier attempts to provide medical schools with measures of proficiency outside of the natural sciences. However, the motivation and relevance for including the behavioral and social sciences on the MCAT is different this time.

One misinterpretation of a behavioral and social science subtest addition is that it reflects an attempt on behalf of the AAMC to assess students’ interpersonal skills. Indeed, the AAMC is interested in measuring professional and personal competencies in domains such as integrity, teamwork, empathy, cultural competency, and communication. But as is obvious to any instructor of introductory psychology or sociology, these skills will not be developed in these courses. Rather than including the PSBB subtest for the purpose of admitting future physicians with a broad liberal arts background, this subtest is being included because of the increasing importance of the behavioral and social sciences in the health sciences. Whereas students of psychology may learn that empathy is associated with patient satisfaction (Kim, Kaplowitz, & Johnson, 2004) and positive health outcomes (Del Canale et al., 2012), they will not learn how to be more empathic — medical schools will need to measure these important skills apart from the MCAT or develop them in medical school.

The goal of the new PSBB subtest is to encourage premedical students to obtain a foundation in the science of behavior — an important component of health and illness. It is now well established that approximately half of all causes of morbidity and mortality in the United States are linked to behavioral and social causes (Mokdad, Marks, Stroup, & Gerberding, 2004; National Center for Health Statistics, 2012). Consequently, in 2004, the Institute of Medicine of the National Academies recommended that “each medical school should expect entering students to have completed coursework in the behavioral and social sciences during their [undergraduate] education” (pp. 7–8).

Recently, the AAMC Behavioral and Social Science Expert Panel (2011b) advocated increased development of the behavioral and social science curriculum in medical schools and proposed competencies for graduating medical students. One of the major obstacles for achieving the recommended competencies is that students arrive in medical schools with different levels of

understanding of principles, methods, and empirical findings in the behavioral and social sciences. Without a common foundation to build upon, it will be difficult to develop behavioral and social science knowledge in an already intense medical school curriculum. As Kaplan, Satterfield, and Kington (2012) noted:

Just as in biology or chemistry, students are unlikely to be able to comprehend complex research studies in behavioral and social sciences without some basic background. The behavioral and social sciences are built on complex methods, theories and a rich accumulation of evidence. Teaching cognitive behavioral intervention to students without a background in learning theory is analogous to teaching pathophysiology to students who have not been exposed to basic biologic principles. (p. 1267)

Once the MR5 Committee decided that the behavioral and social sciences should be tested on the 2015 MCAT, they faced the challenge of determining which aspects of the behavioral and social sciences to include. A broad range of behavioral and social science disciplines are important for understanding health and illness, including anthropology, cognitive science, economics, politics, psychology, and sociology, among others (Kaplan et al., 2012). However, the desire to incorporate broad foundations of the behavioral and social sciences into premedical education must be balanced by the practical realities of expecting additional coursework in an already-packed premedical curriculum.

Two considerations were paramount in the MR5's decision to include material from introductory psychology and sociology. First, these two areas encompass the greatest number of "high priority" items identified in the Institute of Medicine's report on enhancing the behavioral and social sciences in medical school education (Institute of Medicine, 2004). Including these fields in the MCAT is also consistent with the AAMC's *Behavioral and Social Science Foundations for Future Physicians* recommendations (2011b). Second, an analysis of course-taking patterns among medical school applicants revealed that many medical school applicants already take psychology and sociology, with about two-thirds of the applicants completing coursework in psychology and about half of the applicants completing coursework in sociology (AAMC, 2012). Considering that most undergraduate schools have general education and elective requirements, the MR5 determined that including introductory psychology and sociology information would not present a major obstacle for students preparing for the 2015 MCAT.

The PSBB subtest will be organized around broad principles typically found in introductory psychology and sociology, including the ways in which psychological, social, and biological factors influence our perceptions and reactions to the world, behavior and behavior change, and how we think about ourselves and others. In addition, the subtest will test a basic understanding of how cultural and social differences influence well-being and how social stratification influences well-being and access to resources. About 60 percent of the content will come from introductory psychology, 30 percent from introductory sociology, and 10 percent from biology. In order to validate the PSBB subtest of the MCAT, the AAMC is currently conducting research with a representative sample of medical schools to determine its predictive validity for relevant outcome measures, such as medical school grades on behavioral and social science curricula and clerkships.

Practicing Medicine Differently

We should expect physicians to practice medicine differently as a result of incorporating knowledge of the behavioral and social sciences into their practice of medicine. Today's physicians emphasize nutrition and exercise in caring for their patients. Perhaps the next generation of physicians will also inquire about loneliness when taking a clinical history, having learned that the quality of their patients' relationships has an effect on morbidity and mortality comparable to that of the more established risk factor of smoking and greater than that of obesity and inactivity (Holt-Lunstad, Smith, & Layton, 2010). Their inquiry may be further motivated by the knowledge that subjective loneliness is associated with a pattern of up- and down-regulation of genes involved in altering immune functioning (Cole et al., 2007).

Understanding the complex relationships among social, behavioral, and biological factors will become increasingly important in order to most efficiently and effectively practice medicine in the future. Whereas today's physician may emphasize the importance of social support in health outcomes (Taylor, 2007), perhaps the next generation of physicians will be prepared to take into account how culture may interact with social support in determining health outcomes. Seeking explicit social support may lower stress reactivity in European Americans, but might actually increase the stress response in East Asian Americans (Taylor, Welsh, Kim, & Sherman, 2007). Understanding the sociocultural context of health and illness will be critical for practicing medicine in our increasingly diverse society.

Increasingly, "pay for performance" proposals, such as the one currently being considered by New York City, are being proposed as a method for containing health care costs and improving patient care. The core of the idea is that instead of financially rewarding doctors for the number of services ordered, salaries will be tied to factors such as patient satisfaction and outcome. If adopted, physicians may become financially motivated to integrate knowledge of behavioral and social factors into the treatment of their patients.

Encouraging a More Interdisciplinary and Integrative Natural Science Curriculum

MR5 discussions were heavily influenced by the AAMC-HHMI Scientific Foundations for Future Physicians (SFFP) Committee (2009) report. The SFFP Committee defined natural science competencies to be achieved during the undergraduate and medical school years. The report emphasized undergraduate competencies instead of coursework, reflecting the committee's desire to promote more flexibility in the development of undergraduate natural science education. In particular, the SFFP Committee encouraged a more interdisciplinary and integrative natural science curriculum. Although the MR5 was not charged with making recommendations regarding medical school prerequisites, the new MCAT was designed to be consistent with the recommendations of the SFFP. For example, in the new PSBB subtest, items will be developed that reflect integrated knowledge of psychology, sociology, and biology. The subtest will also place a greater emphasis on testing applicants' ability to understand research methods and to analyze and interpret data. There was discussion of emphasizing more advanced knowledge and use of scientific methodology, statistics, and interpretation of data on the 2015 MCAT. However, there is a practical limitation in the number of courses that one could reasonably expect undergraduate students to take in preparation for the MCAT. Therefore, the level of scientific inquiry and reasoning skills to be measured will not require additional coursework beyond introductory natural and social science courses.

Implications of PSBB

Although the implications of the PSBB subtest for medicine should be clear, what are some of the implications for psychology and sociology? First, if students enroll in psychology and sociology courses in order to prepare for the MCAT, we can expect a 50 percent increase in the number of premed students taking introductory psychology and a 100 percent increase in the number of premed students taking introductory sociology. In colleges with a relatively large number of premed students and small sections of introductory courses, accommodating these anticipated increases would be challenging at best.

However, it is important to recognize that we have not seen medical schools add introductory psychology and sociology to their list of natural science prerequisites. Although it may be important for most students to take courses in introductory psychology and sociology in order to prepare for the MCAT, it is not currently required for admission to most medical schools. Therefore, medical school applicants may decide to prepare for the 2015 MCAT by learning PSBB material through independent study and commercial preparation courses. In addition, the advent of massive open online courses may become a welcomed means to access flexible and inexpensive courses in psychology and sociology when preparing for the 2015 MCAT.

As introductory psychology and sociology instructors begin to see more premedical students taking their courses as part of their medical school preparation, we may also begin to see these courses include more health-related issues. Increasing the number of examples of health applications of psychology and sociology would emphasize the relevance of the behavioral and social sciences for increasing the quality of our lives.

In an attempt to create greater efficiency in the premedical curriculum, some highly resourced schools may develop integrated courses in psychology and sociology. Most of us would resist any effort to design our courses solely in response to medical schools, but it will be interesting to see if the advent of the PSBB subtest will inspire the development of integrated courses on the psychology and sociology of human behavior.

The inclusion of an equally weighted subtest on the psychological, social, and biological foundations of behavior on the 2015 MCAT signifies a recognition of the importance of behavioral and social sciences for the practice of medicine. Building a better foundation of the science of behavior during the premedical years should enhance our health and well-being in the 21st century.