



| Medical College Admission Test

# The MCAT<sup>®</sup> Exam: Year at a Glance 2015

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## The MCAT® Exam: Year at a Glance 2015

Students who took the Medical College Admission Test® (MCAT®) in April 2015 took a different exam than the students who took it before them. This short report describes the new MCAT exam, shows how students prepared for it, and reports the characteristics of those who tested in 2015.<sup>1</sup> It explains how scores from the new exam worked and how students from different sociodemographic groups scored. Also reported are the scores of those who submitted new MCAT scores in their 2016 applications to medical school.

Even though the 2015 MCAT exam is brand new, data are already available to show how new scores predict performance in medical school. This guide reports correlations between medical school grades and scores on a prototype of the Psychological, Social, and Biological Foundations of Behavior section of the new exam. It concludes with a description of ongoing research on the impact, use, and validity of the new test.

This report is organized around eight questions:

1. How is the new MCAT exam different from the old?
2. What are the characteristics of students who took the new exam?
3. How did examinees prepare for the new test?
4. How well did the new score scales work?
5. How well did examinees score on the new test?
6. Which 2015 examinees applied for 2016 admission?
7. What information is available about the predictive validity of scores from the new exam?
8. What else will we learn about the impact, use, and validity of the new exam?

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1. This report describes the sociodemographic characteristics, academic preparation, and MCAT scores of examinees who submitted their test results for scoring. At every test administration, a small percentage of examinees decide to void their results; this report excludes data for these examinees.

## 1. How is the new MCAT exam different from the old?

The new MCAT exam shifts the focus from testing what students know to testing how well they use what they know. The blueprints for the new exam are evidence based and target concepts that medical school faculty, residents, and medical students recently rated as important to medical students' success. The test is organized around the academic competencies described by two seminal reports in medical education: *Scientific Foundations for Future Physicians* (2009) and *Behavioral and Social Sciences Foundations for Future Physicians* (2011).

The new exam asks students to demonstrate their scientific reasoning skills by solving problems in the natural, behavioral, and social sciences. It also asks test takers to reason about research and data. The new exam reflects the heavy information-processing requirements of medical school by having examinees demonstrate that they understand and can critically analyze text.


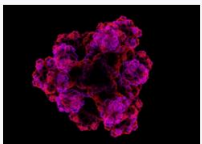


The new and old exams are different. Like the old exam, the new exam tests concepts taught in the year-long, baccalaureate courses of biology, general chemistry, organic chemistry, and physics, as well as verbal reasoning skills. The new exam, however, requires more: it asks applicants to solve problems using concepts taught in first-semester biochemistry, psychology, and sociology courses.

Content	New MCAT Exam	Old MCAT Exam
Biology	√	√
Chemistry	√	√
Physics	√	√
Verbal Reasoning	√	√
Biochemistry	√	
Psychology	√	
Sociology	√	

### The new exam

- Asks students to apply what they've learned by solving scientific problems and reasoning about research and data
- Requires broader preparation
- Gives attention to the behavioral and sociocultural aspects of health
- Incorporates the latest science on information processing

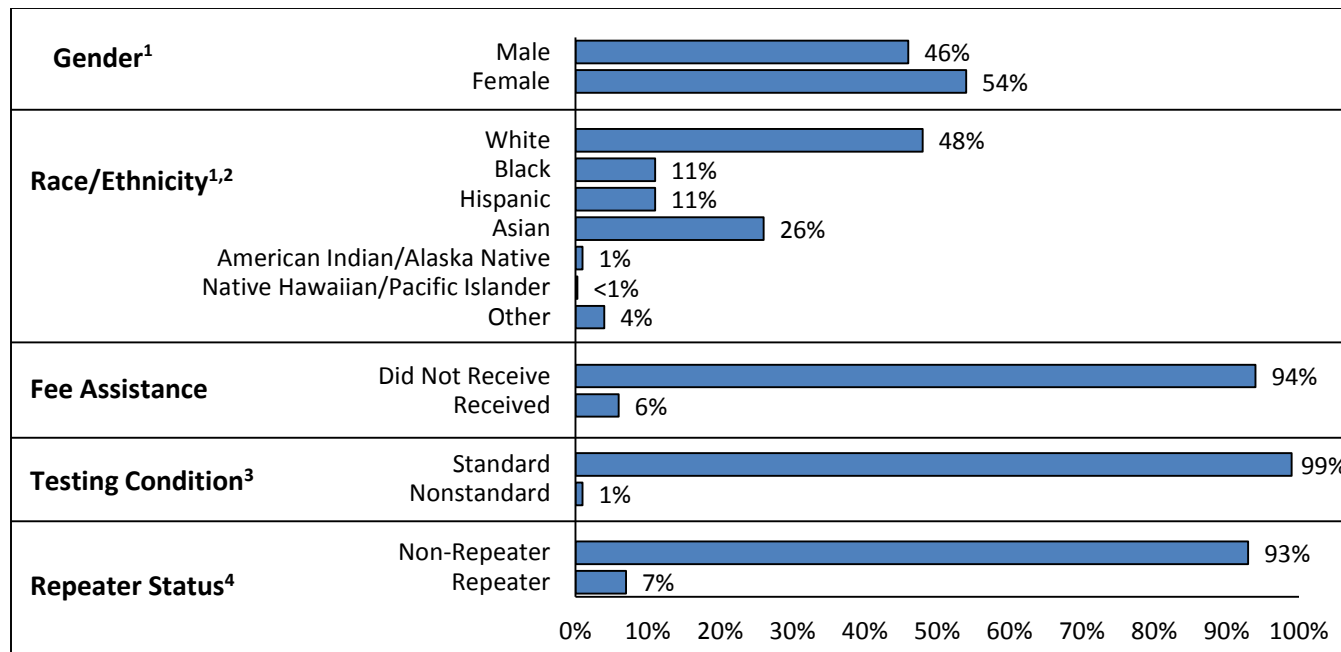
The new exam consists of four sections.

Biological and Biochemical Foundations of Living Systems Section	Chemical and Physical Foundations of Biological Systems Section	Psychological, Social, and Biological Foundations of Behavior Section	Critical Analysis and Reasoning Skills Section
<a href="#">Learn More</a>	<a href="#">Learn More</a>	<a href="#">Learn More</a>	<a href="#">Learn More</a>
			

## 2. What are the characteristics of students who took the new exam?

Almost 60,000 students took the new exam in 2015, and their characteristics mirrored those of previous test takers. There was concern that some groups of examinees would be more reticent than others to take the new exam. But students took the new exam in the same proportions as they took the old exam.

**Figure 1. Percentage of Examinees Taking the New MCAT Exam by Gender, Race/Ethnicity, Fee Assistance Status, Testing Condition, and Repeater Status (N = 59,996)**



### Notes

1. Percentages describe examinees who provided information about their gender and race/ethnicity.
2. Percentages do not add up to 100% because some examinees reported multiple races or ethnicities.
3. Score reports do not indicate whether scores were obtained under standard or nonstandard conditions.
4. Repeaters are examinees who took the new MCAT exam multiple times in 2015.

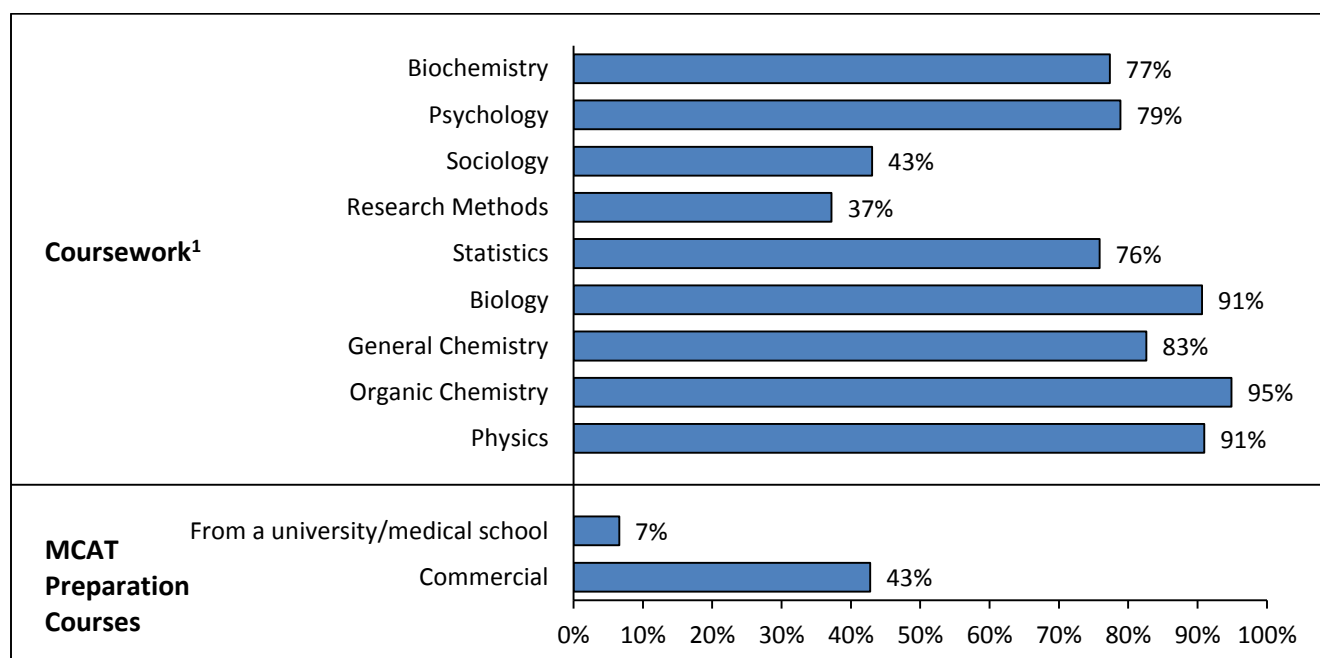
### 3. How did examinees prepare for the new test?

As already mentioned, the new exam requires broader preparation than the old, testing concepts from first-semester biochemistry, psychology, and sociology and asking students to demonstrate that they can reason about research and data.

Data about courses the 2015 examinees took show how they prepared in these new areas. As in the past, almost all students took biology, chemistry, and physics. Most 2015 examinees took biochemistry, psychology, and statistics before testing; many took sociology and research methods. The numbers of students taking courses in biochemistry, psychology, sociology, and statistics were higher than in the past.

The percentages of students who took commercial or university- or medical school-based preparation courses before the new exam were similar to the past, with about half of the examinees taking preparation courses for the new test.

**Figure 2. Percentage of Examinees Taking the New MCAT Exam Who Completed College Coursework in the Natural, Behavioral, and Social Sciences or MCAT Preparation Courses (N = 59,996)**



Note

1. Percentages describe the preparation of examinees who provided information about their coursework and completion of MCAT preparation courses. Examinees reported the courses for which they had AP, IB, CLEP, community college, or four-year college credit.

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#### 4. How well did the new score scales work?

Because the new and old MCAT exams test different knowledge and skills, the scales for reporting the scores on the new exam have changed. This way, the scores on the new exam will acquire new meaning and won't be confused with scores on the old exam. The new scales have round, memorable numbers at the center so they draw attention to the middle of the scales and encourage admissions committees to consider applicants who might otherwise be overlooked. Research on past exams shows that the vast majority of students who enter medical school with scores in the center of the scale succeed. These students graduate in four or five years and pass their licensing exams on the first try.

On the new exam, the four section scores are centered at 125 and range from 118 to 132. The four section scores sum to the total score, which is centered at 500 and ranges from 472 to 528.

Because the new exam uses new score scales, admissions committees essentially have to “start over” this year, attaching new meaning to the scores and developing new conventions for selecting students. To help with this process, the new score reports pair the scores with percentile ranks that show how individual examinees compare with others who took the new exam.

Computing these percentile ranks before students finished testing in 2015 was a challenge. History suggested that students testing early in 2015 would be more capable than later examinees, and the percentile ranks of the scores for these early examinees would misrepresent the percentile ranks of scores for students from a typical, full testing year. To address this, the percentile ranks for 2015 scores were calculated by weighting the data from early examinees to represent the demographic and academic characteristics of students testing in a typical testing year. These percentiles were reported with the section and total scores of all 2015 examinees.

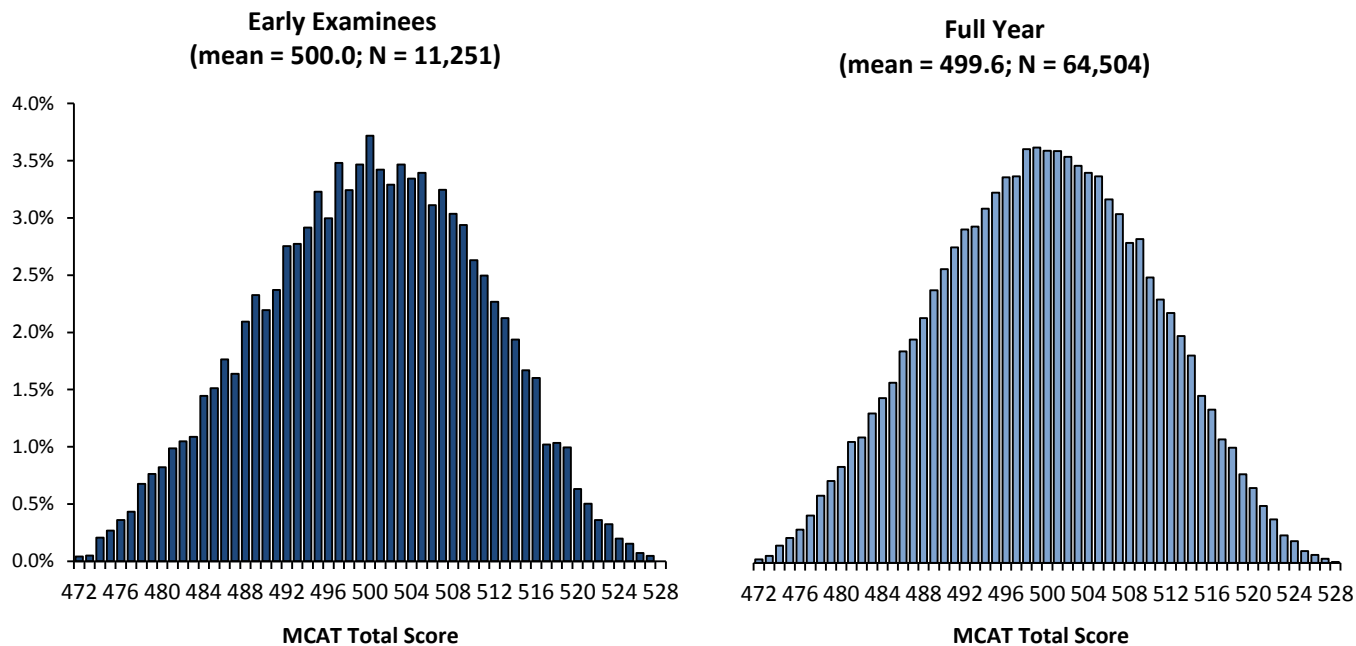
The left-hand distribution in Figure 3 shows the weighted distribution of early examinees' total scores. The distribution on the right shows scores from the full testing year. The weighted score distribution was very similar to the observed distribution for the new test, which suggests that the weighting and reported percentile ranks worked well.

Section score distributions for the full 2015 testing year appear in Appendix 1. The weighed distributions from early examinees for the four section scores are not shown, but they, like the total score distributions, looked similar to the full-year distributions.<sup>2</sup>

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2. There was a small difference between the weighted and observed distributions of scores for high-scoring examinees on the Critical Analysis and Reasoning Skills section.

**Figure 3. Weighted Distribution of Early Examinees' Total Scores on the New MCAT Exam and Distribution of Total Scores for the Full 2015 Testing Year<sup>1, 2</sup>**



**Notes**

1. These score distributions include multiple scores for examinees who took the new MCAT exam more than once in 2015. Seven percent of examinees took the new exam multiple times. Almost no one tested more than once in April and May 2015.
2. The reliability of the total score is .95, and the standard error of measurement for the total score is 2. Section score reliabilities range from .82 to .86, and the standard errors of measurement for section scores are 1.

## 5. How well did examinees score on the new test?

The average total score for 2015 examinees was 500, and there was wide variability in the score distribution. The graph in Figure 4 uses box-and-whisker plots to report median (50th percentile) scores for students from different sociodemographic groups, along with 10th, 25th, 75th, and 90th percentile scores. Comparing these box-and-whisker plots for examinees from different sociodemographic groups shows the overlap in scores between groups—the boxes span similar, wide ranges of scores.

The median scores differ by group, however, with males scoring slightly better than the females, majority examinees scoring better than examinees from groups underrepresented in medicine, and examinees who do not receive fee assistance scoring slightly better than those who do. These differences are similar to differences on the old exam and may reflect differences between groups in the courses the students took.

The box-and-whisker plots also summarize scores for students who took the new exam under standard testing conditions and those who tested under nonstandard conditions. Scores are summarized for first-time examinees and repeaters who took the new exam. The differences between non-repeaters and repeaters on the new exam are similar to differences in the past, as are the differences between repeaters' scores on their first and second attempts at the new exam.

### Scores for 2016 Applicants who Submitted Scores from the New and Old MCAT Exams

About 34% of students who took the new exam also took the old exam. Some of these examinees applied to enter medical school in 2016. Admissions officers have many good questions about the scores these applicants reported.

Many applicants who took both tests had scores with notably higher percentiles on the new test than on the old. This observation made some admissions officers wonder whether the new test is easier than the old. But there are several alternative explanations for these results.

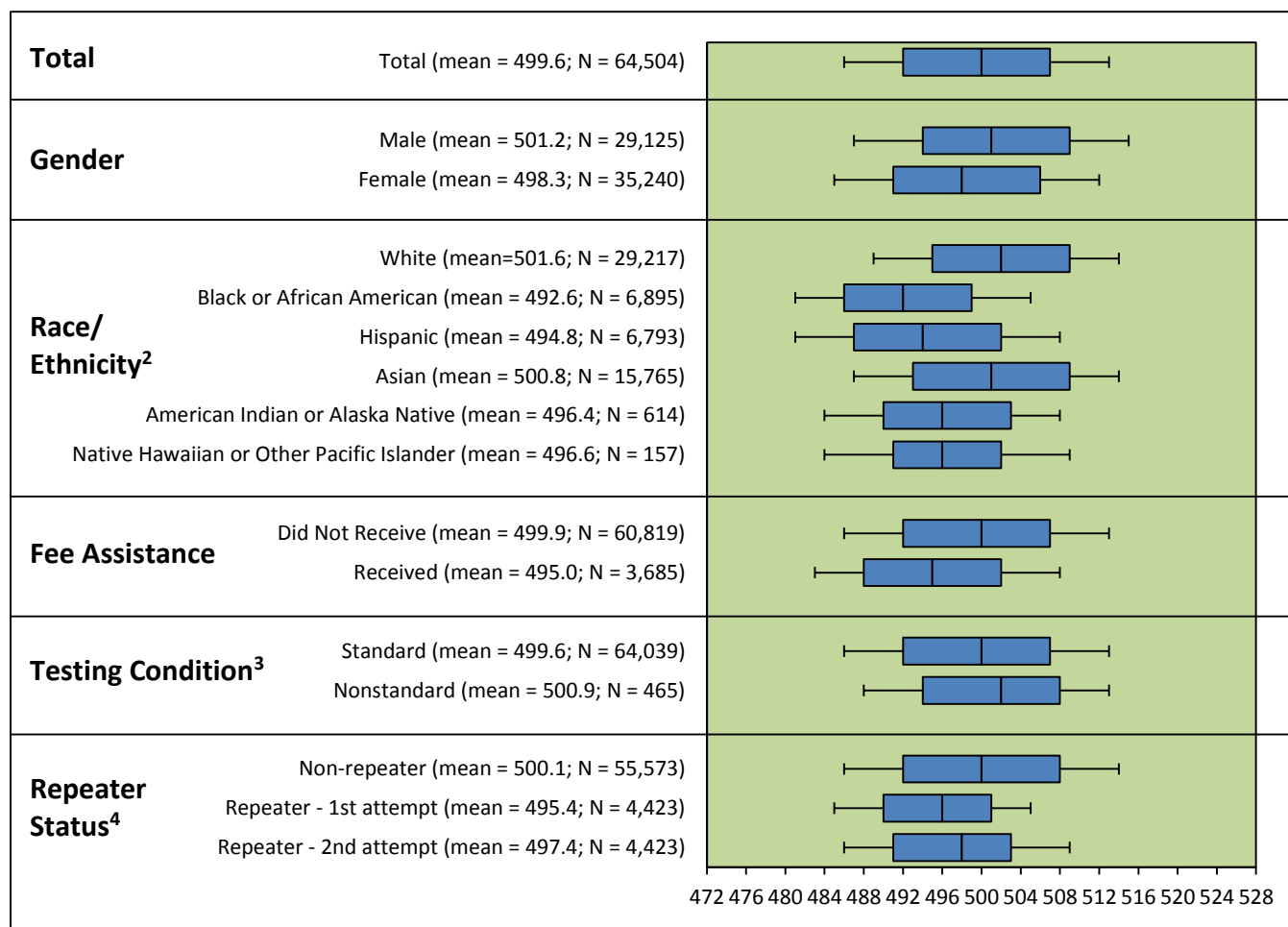
First, on average, students who repeat their MCAT exam start with relatively low scores. Students don't repeat their exam if they're satisfied with their initial scores. Lower-scoring examinees have more room to improve their scores than higher-scoring examinees. Repeaters are likely to prepare more diligently the second time around.

Second, when students took the old exam multiple times, the percentile ranks associated with their later scores were generally higher than the percentiles for their first exams. The average repeater on the old exam earned scores that were more than ten percentile points higher than their initial scores. Many of the percentile gains that admissions officers saw for 2016 applicants submitting scores from both the old and new exams were similar in size.

Third, examinees were more likely to apply to medical school if the percentile ranks for their scores on the new exam were higher than the percentile ranks for their scores on the old exam. Examinees with similar percentile ranks for scores on the two exams or whose scores on the old exam had higher percentile ranks than their scores on the new exam were less likely to apply.



**Figure 4. New MCAT Total Scores for 2015 Examinees Overall and by Gender, Race/Ethnicity, Fee Assistance Status, Testing Condition, and Repeater Status (N = 64,504)<sup>1</sup>**



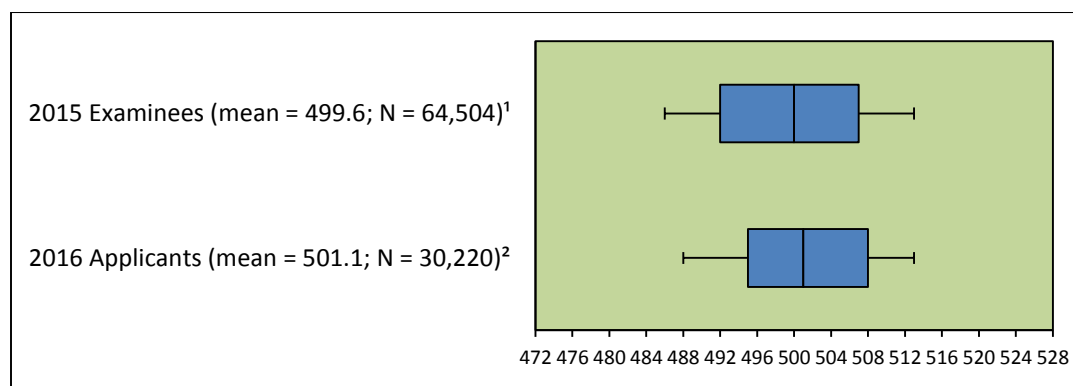
Notes

1. These box-and-whisker plots include multiple scores for examinees who took the new MCAT exam more than once in 2015. Seven percent of examinees took the new exam multiple times.
2. Data for examinees who reported their race/ethnicity as “other” are not shown.
3. Score reports do not indicate whether scores were obtained under standard or nonstandard conditions.
4. Repeaters are examinees who took the new MCAT exam multiple times in 2015.

## 6. Which 2015 examinees applied for 2016 admission?

Not everyone who takes the MCAT exam subsequently applies to a U.S. medical school. Some examinees do not consider their scores to be competitive. Some apply to other health professions schools or to Canadian medical schools, and others defer their applications. The data for 2015 examinees who applied to U.S. medical schools for 2016 admission are shown next. The median score for applicants is slightly higher than the median score for examinees.

**Figure 5. New MCAT Total Scores for 2015 Examinees and 2016 Applicants**



### Notes

1. These box-and-whisker plots include multiple scores for examinees who took the new MCAT exam more than once in 2015. Seven percent of examinees took the new exam multiple times.
2. These box-and-whisker plots describe new MCAT total scores submitted by individuals applying to medical school in the 2016 application cycle and include multiple scores for examinees who took the MCAT exam more than once during 2015. Application data are current as of December 31, 2015. A very small number of examinees applied for 2016 admission after that date.

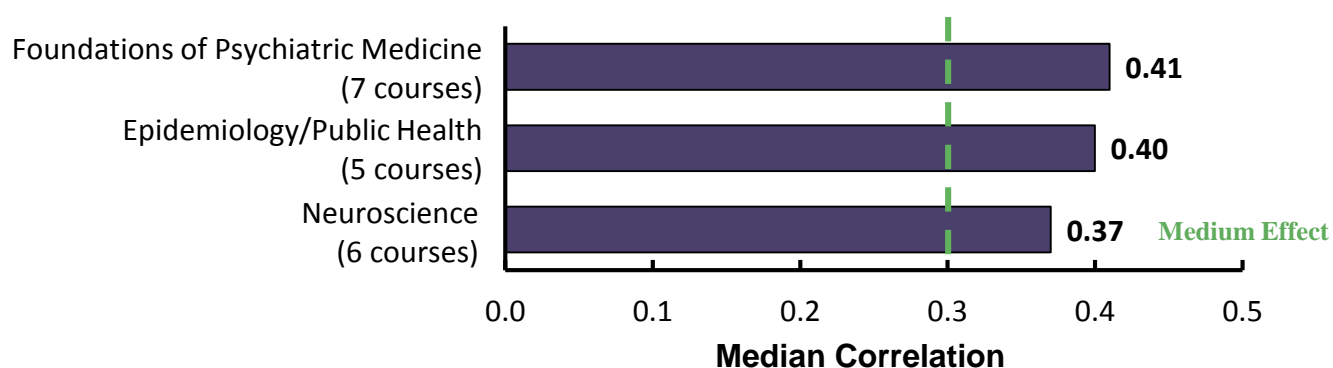
## 7. What information is available about the predictive validity of scores from the new exam?

Researchers from eleven medical schools partnered with the AAMC to examine the predictive validity of scores from the section of the new exam that is most different from the old, the Psychological, Social, Biological Foundations of Behavior section. In 2013 these researchers administered a prototype of the test to more than 2,000 first- and second-year medical students before they started the school year. The researchers then correlated students' prototype scores with grades from medical school courses that draw on the behavioral and social sciences.

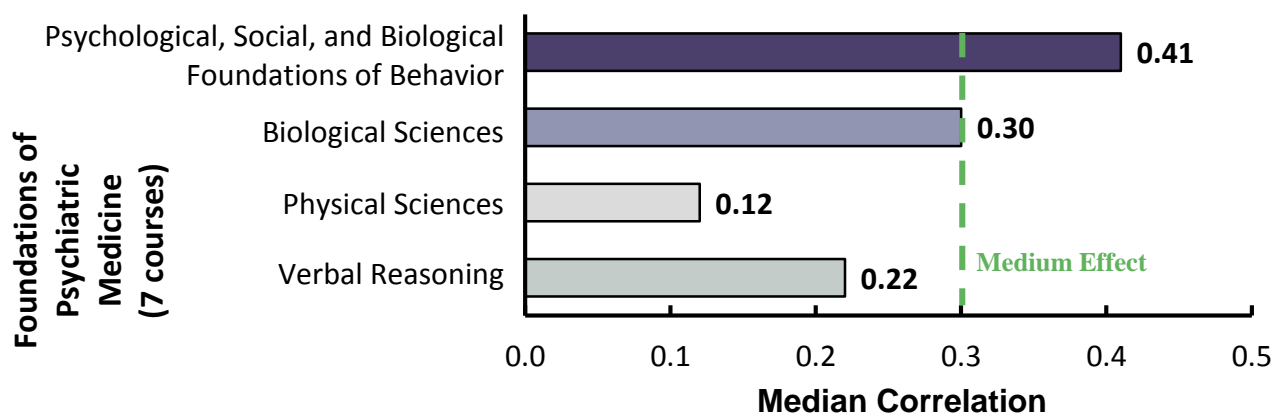
The results of these analyses show that scores from the Psychological, Social, and Biological Foundations of Behavior section correlate well with grades in courses such as foundations of psychiatric medicine, epidemiology/public health, and neuroscience. And because participating students entered medical school with scores from the old MCAT exam, researchers were able to compare these correlations with correlations made with the old exam. The correlations between MCAT scores and grades in foundations of psychiatric medicine courses were higher for the prototype test than for scores from the old exam. The same was true for grades in epidemiology/public health.

These data suggest that scores from the Psychological, Social, and Biological Foundations of Behavior section are likely to add value to the information that other sections of the new MCAT exam provide. The data provide support for using these scores in 2016 student selection.

**Figure 6. Median Correlations between the Psychological, Social, and Biological Foundations of Behavior Section Scores and Medical Students' Grades in Three Types of Courses.**



**Figure 7. Comparison of Median Correlations between New and Old MCAT Section Scores and Medical Students' Grades in Foundations of Psychiatric Medicine Courses.**



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## **8. What else will we learn about the impact, use, and validity of the new exam?**

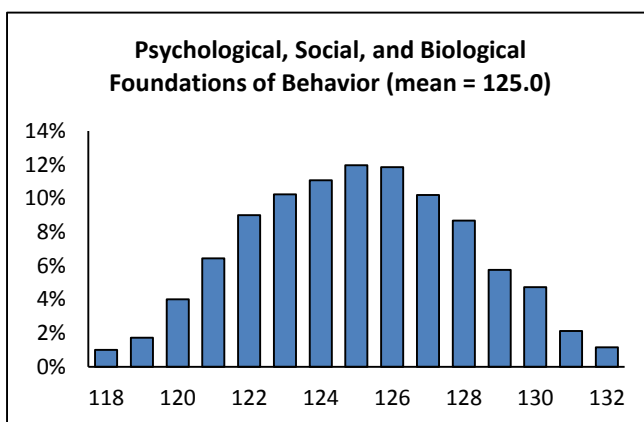
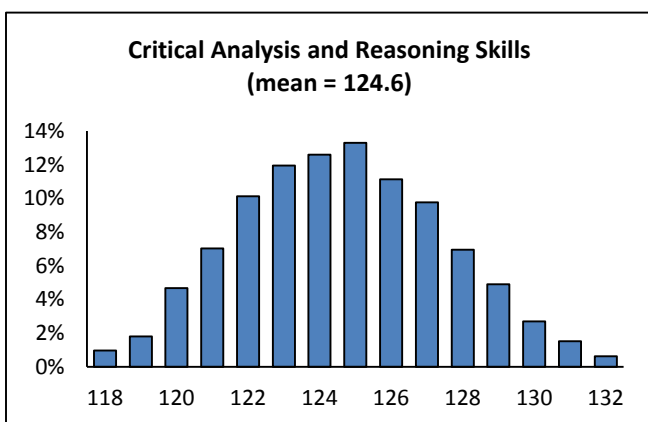
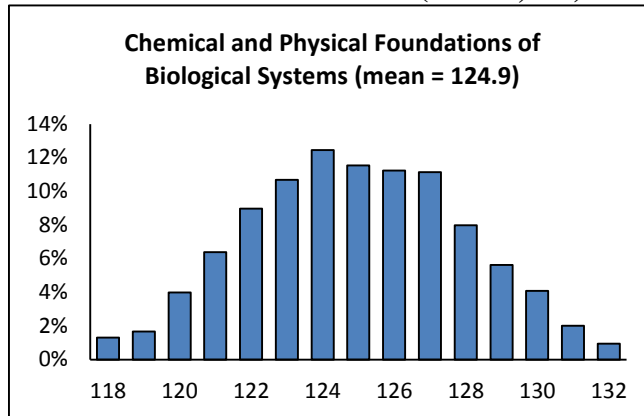
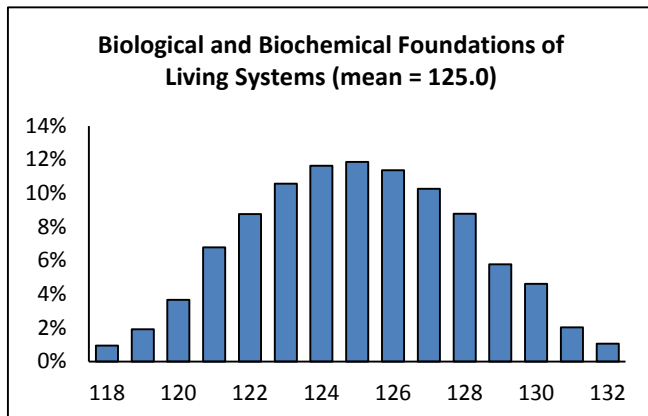
The research that was just described is only the beginning of the work that researchers are doing to evaluate the new exam. Admissions officers and researchers from 18 medical schools are mounting a validity research program to study the new exam. They will determine how well scores from the new MCAT exam predict performance in medical school.

Researchers will also examine how students prepare for and perform on the new exam and whether there are ways to improve the information and resources that are available to underperforming students. Researchers will study the way that scores are used with other information about academic preparation, experiences, and attributes in admissions decision making.

Fairness issues will play a key role in this research on preparation, use, and the predictive validity of the new MCAT exam. For each of these investigations, researchers will look for points of leverage to improve information, bolster resources, and provide guidance about sound practice. Their work and results will be reported annually at meetings and conferences and in reports to the admissions, student affairs, diversity affairs, and academic affairs communities.

## Appendix 1

### Distribution of Section Scores on the New MCAT Exam for 2015 Examinees (N = 64,504)<sup>1</sup>



**Note**

1. These score distributions include multiple scores for examinees who took the new MCAT exam more than once in 2015. Seven percent of examinees took the new exam multiple times.



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