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Tomorrow's Doctors, Tomorrow's Cures

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Defining and Measuring Competencies in Medical Education + MCAT Update

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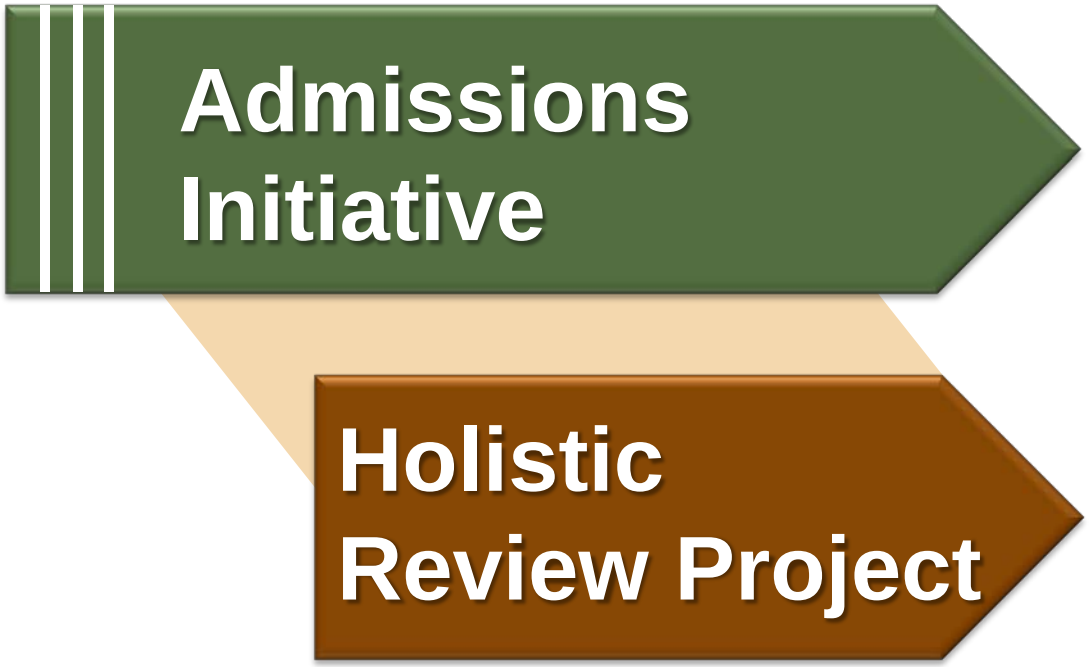
TAAHP - Dallas
February 8, 2013

Association of
American Medical Colleges

Two projects on parallel paths



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Admissions Initiative Objective:

Our objective is to provide medical schools with better information about a set of core entry-level personal and academic competencies in a timely manner. This information should:

- Come from multiple tools and sources to allow admissions committees to triangulate information.
- Be available for use at the time of the initial screening of applicants.

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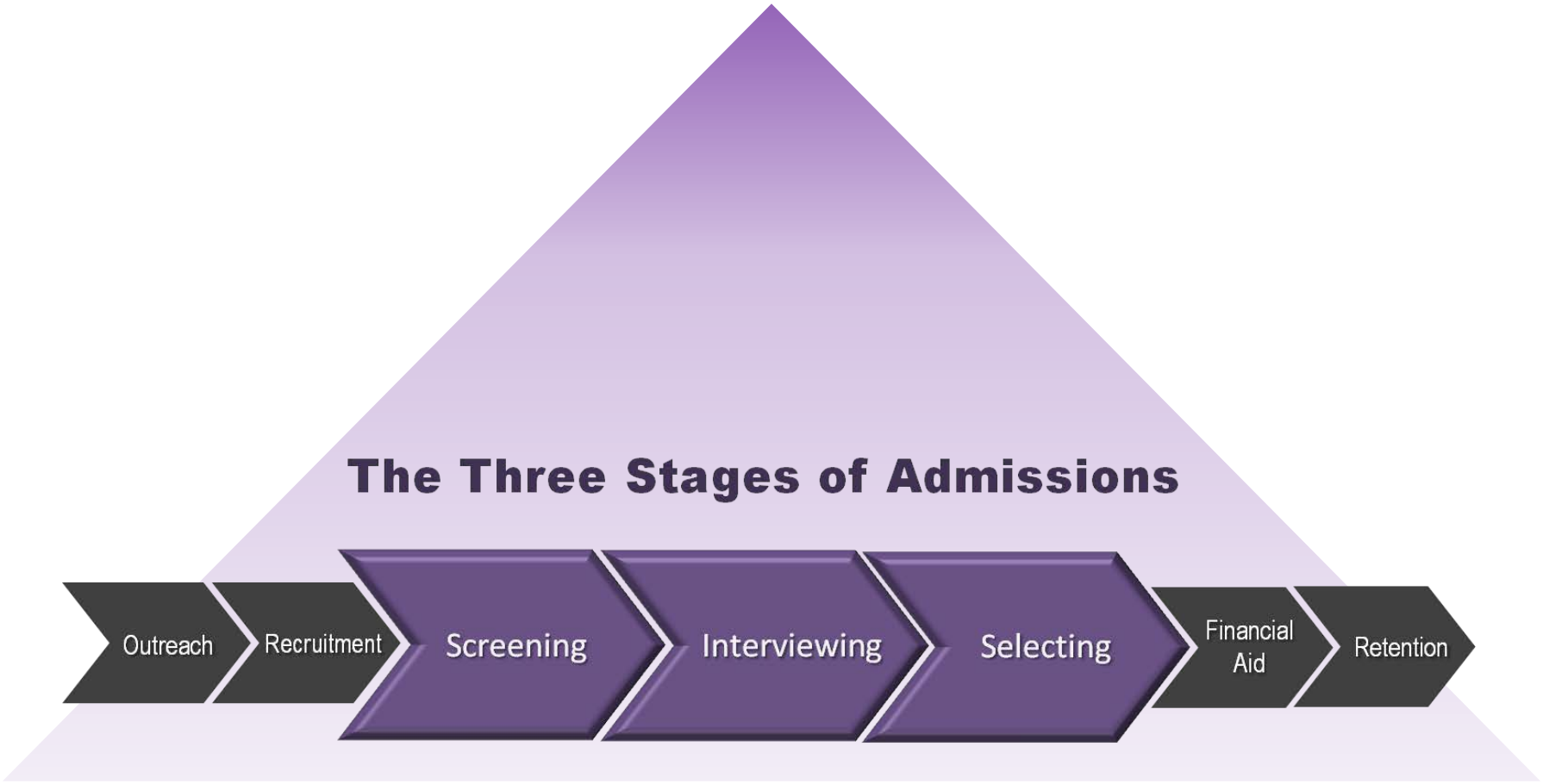
The Three Stages of Admissions
Outreach
Recruitment
Screening
Interviewing
Selecting
Financial Aid
Retention

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Competencies:

The AAMC remains dedicated to creating a pathway towards Competency-Based Medical Education, and our project will continue to work towards a pathway to Competency-Based Admissions (CBA).

MCAT^{2015} reflects the competencies outlined in the 2009 SFFP report and the 2011 BSSFFP report, and these will be evidenced in our work towards CBA.

In addition to this work with entering competencies, the AAMC is currently working with an expert panel of medical school and GME faculty on graduation competencies to define what new physicians should be able to do by themselves ("entrustable activities") on day 1 of residency.

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Competency-Based Medical Education

CBME is an outcomes-based approach to the design, implementation, assessment, and evaluation of medical education programs that uses an organizing framework of competencies. In CBME, competencies – observable abilities related to a specific activity that integrates knowledge, skills, values, and attitudes – are prioritized over the measurement of knowledge alone.

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Competency-Based Admissions

CBA is an approach to admissions that employs processes intended to determine each applicant's ability to demonstrate a core set of entry-level competencies needed to succeed in medical school, residency and in medical practice.

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Blue-ribbon Panel Reports

Scientific Foundations for Future Physicians Report (2009)

Behavioral and Social Science Foundations for Future Physicians (2011)

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Thinking and Reasoning Skills and Science Competencies:

Category	Competencies
Thinking and Reasoning	• Critical Thinking • Quantitative Reasoning • Scientific Inquiry • Written Communication
Science	• Living Systems • Human Behavior

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Interpersonal and Intrapersonal Competencies:

Category	Competencies
Interpersonal	• Service orientation • Social skills • Cultural competence • Team work • Oral communication
Intrapersonal	• Ethical Responsibility to Others • Reliability and dependability • Resilience and adaptability • Capacity for improvement

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Tied to the ACGME competencies

- Patient Care
- Medical knowledge
- Professionalism
- Interpersonal and communication skills
- Practice-based learning and assessment
- Systems-based practice

- Personal and Professional Development*
- Inter-professional collaboration*

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Where students display the Thinking and Reasoning Skills and Science competencies

- GPA
- MCAT
- coursework
- research work
- job experiences
- standardized letters of evaluation

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Where students display the Interpersonal and Intrapersonal competencies

- Standardized letters of evaluation
- Experiences
- Reflections on experiences
- Interviews
- A standardized national evaluation – situational judgment test

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Are All Competencies Equal?

- Chesapeake LAN January 2013:
  - Howard
  - University of Maryland
  - Johns Hopkins
  - Uniformed Services University

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Admissions Initiative Status – February 2013

- National COA has approved IP/IP competencies and the Thinking and Reasoning Skills/Science competencies at this time
- Working with the medical schools to update their pre-requisites, especially chemistry track to biochemistry
- Establishing new guidelines for letters of evaluation coordinated with the NAAHP letters committee
- Researching situational judgment test options

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SJT

- Lievens/Sackett
- Studied interpersonal skills of 723 medical school applicants (age 18/4, Belgium) using a video-based SJT
- tested “building and maintaining relationships” and “communication/exchanging information”
- hypothesis is that interpersonal skills are stable. i.e. that subsequent training does not effect relative rank

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SJT (2)

- no medical knowledge required but vignettes were based on medical scenarios
- 30 questions, tape stopped, 25 seconds to choose ¼ responses
- SJT scores compared with internship or post-internship job performance ratings of same students/physicians
- SJT had higher correlation with performance than the national cognitive or written test
- Journal of Applied Psychology, February 2012

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MCAT2015

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How is MCAT Keeping Pace With Medicine?

- Periodic reviews to ensure measure of most important academic competencies in most capable ways
- Competencies required in medical school are shifting
- 5th review of the MCAT since 1928
- Last full review in 1991
- New version in place through 2030 (at least)

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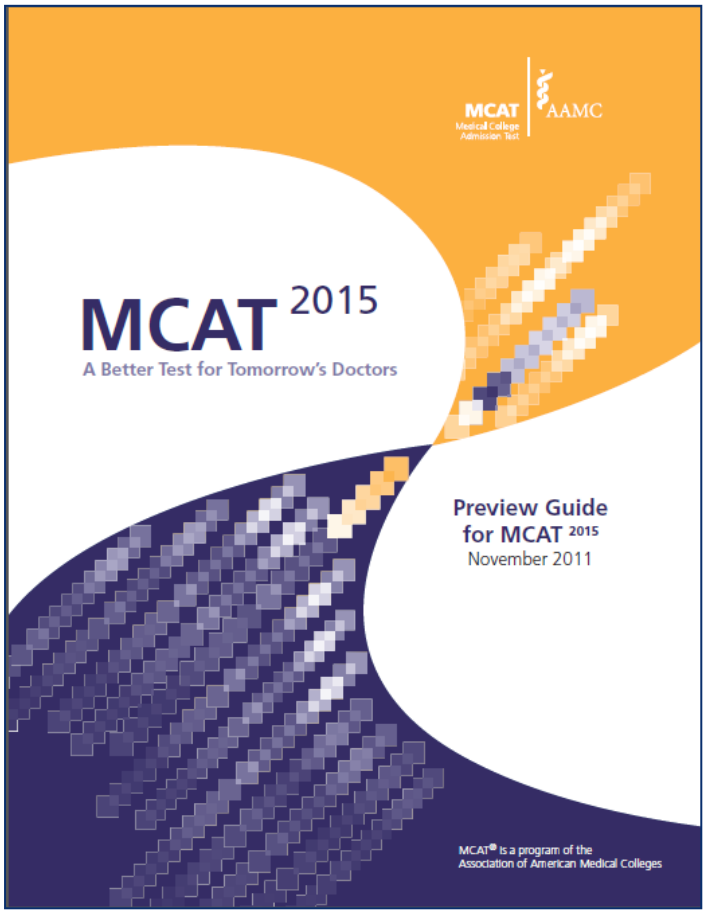
MCAT 2015



Final recommendations:

Approved by AAMC Board of Directors February 2012

Administer new exam:

Spring 2015

www.aamc.org/mcat2015

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MCAT2015

Preserves Testing Of:

- Natural sciences concepts medical school faculty want entrants to know
- Critical analysis and reasoning skills needed for success in medical school

Eliminates:

- Under-utilized writing sample section (in 2013)

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MCAT^{2015} – 4 Sections, 4 Scores

Biological & Biochemical Foundations of Living Systems

Chemical & Physical Foundations of Biological Systems

Psychological, Social, & Biological Foundations of Behavior

Critical Analysis & Reasoning Skills

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current MCAT	# of Test Items	Testing Time (minutes)
Biological Sciences	52	70
Physical Sciences	52	70
Verbal Reasoning	40	60
Writing Sample	2 Essays	60
Total Content Time		4 hours, 20 min

MCAT2015	# of Test Items	Testing Time (minutes)
Biological & Biochemical Foundations of Living Systems	65	95
Chemical & Physical Foundations of Biological Systems	65	95
Lunch Break		
Critical Analysis & Reasoning Skills	60	90
Psychological, Social, & Biological Foundations of Behavior	65	95
Total Content Time		6 hours, 15 min

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Scientific Inquiry & Reasoning Skills (SIRS)

- Knowledge of Scientific Concepts & Principles
- Scientific Reasoning Problem Solving
- Reasoning About the Design and Execution of Research
- Data-based and Statistical Reasoning

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Biological & Biochemical Foundations of Living Systems

What it tests?

Combine knowledge of foundational concepts in the biological and biochemical sciences with your scientific inquiry, reasoning, and research and statistics skills to solve problems that demonstrate readiness for medical school.

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Biological & Biochemical Foundations of Living Systems

Exam content in this section typically taught in:

- Introductory biology
- Introductory general chemistry
- Introductory organic chemistry
- First semester biochemistry

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Chemical & Physical Foundations of Biological Systems

What it tests?

Combine your knowledge of foundational concepts in the chemical and physical sciences with your scientific inquiry, reasoning, and research and statistics skills to solve problems that demonstrate readiness for medical school.

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Chemical & Physical Foundations of Biological Systems

Exam content in this section typically taught in:

- Introductory biology
- Introductory general chemistry
- Introductory organic chemistry
- Introductory physics
- First semester biochemistry

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Psychological, Social, & Biological Foundations of Behavior

What it tests?

Knowledge and use of the concepts in psychology, sociology, biology, research methods, and statistics that provide a solid foundation for learning in medical school about the behavioral and socio-cultural determinants of health and health outcomes.

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Psychological, Social, & Biological Foundations of Behavior

Exam content in this section typically taught in:

- Introductory psychology
- Introductory sociology
- Introductory biology

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Critical Analysis & Reasoning Skills

What it tests?

This section asks you to critically analyze, evaluate, and apply information presented in a passage.

No specific course content material

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Critical Analysis & Reasoning Skills

Skills tested:

- Foundations of Comprehension
- Reasoning Within the Text
- Reasoning Beyond the Text

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Critical Analysis & Reasoning Skills

Passages from humanities & social sciences:

- Ethics
- Philosophy
- Cross-cultural studies
- Population health

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Table 2. Percentage of 2009-2011 Applicants Accepted into at Least One Medical School, by MCAT Total Score and Undergraduate GPA Range

	MCAT Total										
GPA Total	**5-14**	**15-17**	**18-20**	**21-23**	**24-26**	**27-29**	**30-32**	**33-35**	**36-38**	**39-45**	**All**
3.80-4.00	**1%** 1/70	**4%** 8/180	**17%** 80/480	**26%** 355/1,368	**42%** 1,373/3,290	**67%** 4,028/6,048	**82%** 6,197/7,550	**86%** 5,159/5,986	**90%** 2,956/3,290	**91%** 1,171/1,280	**72%** 21,328/29,542
3.60-3.79	**1%** 1/174	**3%** 13/380	**10%** 105/1,001	**18%** 414/2,245	**28%** 1,284/4,588	**51%** 3,777/7,458	**72%** 5,654/7,889	**80%** 3,878/4,853	**85%** 1,602/1,895	**85%** 363/429	**55%** 17,091/30,912
3.40-3.59	**1%** 4/296	**3%** 15/508	**10%** 114/1,186	**17%** 428/2,559	**23%** 1,053/4,584	**36%** 2,456/6,734	**54%** 3,523/6,558	**67%** 2,225/3,329	**73%** 832/1,139	**78%** 161/206	**40%** 10,811/27,099
3.20-3.39	**1%** 2/360	**1%** 5/518	**8%** 88/1,130	**13%** 267/2,102	**18%** 596/3,327	**26%** 1,099/4,238	**39%** 1,496/3,843	**52%** 917/1,767	**62%** 302/490	**63%** 60/96	**27%** 4,832/17,871
3.00-3.19	**0%** 2/441	**3%** 15/516	**6%** 59/950	**11%** 168/1,481	**16%** 328/2,013	**24%** 554/2,281	**30%** 517/1,725	**42%** 331/784	**44%** 100/225	**50%** 16/32	**20%** 2,090/10,448
2.80-2.99	**0%** 0/364	**1%** 4/393	**4%** 27/645	**11%** 89/831	**16%** 156/989	**16%** 152/976	**25%** 184/741	**32%** 86/265	**33%** 30/90	**50%** 10/20	**14%** 738/5,314
2.60-2.79	**0%** 0/299	**2%** 4/239	**4%** 16/375	**7%** 32/461	**11%** 56/522	**15%** 64/436	**22%** 64/290	**25%** 33/132	**21%** 8/38	**23%** 3/13	**10%** 280/2,805
2.40-2.59	**0%** 0/197	**0%** 0/145	**2%** 4/184	**4%** 8/211	**6%** 13/214	**10%** 17/168	**19%** 19/100	**23%** 13/57	**13%** 2/15	**--**	**6%** 76/1,292
2.20-2.39	**0%** 0/142	**0%** 0/71	**2%** 2/88	**4%** 3/74	**11%** 9/79	**11%** 6/56	**3%** 1/30	**16%** 3/19	**--**	**--**	**4%** 25/564
2.00-2.19	**0%** 0/70	**2%** 1/43	**0%** 0/32	**4%** 1/26	**5%** 1/19	**0%** 0/19	**8%** 1/13	**--**		**--**	**2%** 5/225
1.47-1.99	**0%** 0/36	**0%** 0/12	**--**	**--**	**--**	**--**	**--**	**--**			**1%** 1/88
All	**0%** 10/2,449	**2%** 65/3,005	**8%** 495/6,078	**16%** 1,765/11,367	**25%** 4,870/19,633	**43%** 12,153/28,423	**61%** 17,656/28,745	**74%** 12,646/17,195	**81%** 5,833/7,186	**86%** 1,784/2,079	**45%** 57,277/126,160

Notes:

1. Dark Green shading = acceptance rates ≥ 75%; Light Green shading = acceptance rates of 50-74%; Grey shading = acceptance rates of 25-49%.

2. Dashes = cells with fewer than ten observations; blank cells = cells with zero observations.

3. For students who took the MCAT exam multiple times, the most recent MCAT total score in each application year was used in this analysis.

Table 3. Percentage of 2004-2006 Students Who Graduated from Medical School in Four Years, by MCAT Total Score and Undergraduate GPA Range

	MCAT Total										
GPA Total	**5-14**	**15-17**	**18-20**	**21-23**	**24-26**	**27-29**	**30-32**	**33-35**	**36-38**	**39-45**	**All**
3.80-4.00	--	**89%** 16/18	**77%** 78/101	**85%** 313/370	**87%** 1,214/1,388	**91%** 3,057/3,371	**91%** 3,436/3,795	**89%** 2,541/2,865	**87%** 1,227/1,405	**85%** 370/436	**89%** 12,255/13,754
3.60-3.79	--	**67%** 20/30	**67%** 78/116	**79%** 358/454	**85%** 1,238/1,465	**89%** 3,074/3,465	**88%** 3,279/3,708	**87%** 1,928/2,212	**87%** 736/849	**85%** 178/209	**87%** 10,895/12,517
3.40-3.59	**58%** 7/12	**54%** 15/28	**72%** 96/133	**70%** 280/399	**79%** 934/1,183	**85%** 2,266/2,663	**87%** 2,512/2,872	**88%** 1,261/1,433	**83%** 433/524	**86%** 84/98	**84%** 7,888/9,345
3.20-3.39	--	**52%** 12/23	**57%** 63/110	**66%** 238/362	**79%** 589/746	**86%** 1,133/1,315	**87%** 1,232/1,409	**87%** 567/655	**89%** 178/199	**85%** 33/39	**83%** 4,047/4,862
3.00-3.19	--	**60%** 15/25	**57%** 47/83	**68%** 150/222	**75%** 293/392	**83%** 454/546	**85%** 499/584	**87%** 219/251	**86%** 61/71	**79%** 11/14	**80%** 1,749/2,191
2.80-2.99	--	**33%** 4/12	**59%** 29/49	**65%** 89/136	**71%** 139/195	**81%** 170/211	**84%** 158/189	**90%** 62/69	**87%** 27/31	**100%** 10/10	**76%** 689/905
2.60-2.79		--	**58%** 15/26	**54%** 29/54	**71%** 56/79	**82%** 62/76	**78%** 47/60	**73%** 19/26	**80%** 8/10	--	**71%** 240/340
2.40-2.59		--	--	**60%** 9/15	**79%** 15/19	**75%** 18/24	**86%** 19/22	--	--		**77%** 77/100
2.20-2.39	--	--		**50%** 5/10	**55%** 6/11	--	--	--	--	--	**55%** 23/42
2.00-2.19	--	--	--	--	--	--	--				**33%** 4/12
1.47-1.99			--								--
All	**50%** 19/38	**58%** 87/149	**65%** 410/627	**73%** 1,471/2,026	**82%** 4,485/5,479	**88%** 10,242/11,682	**88%** 11,186/12,644	**88%** 6,605/7,521	**86%** 2,674/3,094	**85%** 688/809	**86%** 37,867/44,069

Notes:

1. Blue shading = graduation rates of 90-100%; Green shading = graduation rates of 80-89%; Orange shading = graduation rates of 70-79%.

2. Dashes = cells with fewer than ten observations; blank cells = cells with zero observations.

3. Students enrolled in joint programs (e.g., MD-PhD), participating in special research/non-research studies, or deceased are not included in this table.

4. For students who took the MCAT exam multiple times, the most recent MCAT total score at the time of matriculation was used in this analysis.

Table 4. Percentage of 2004-2006 Students Who Graduated from Medical School in Five Years, by MCAT Total Score and Undergraduate GPA Range

GPA Total	MCAT Total										
	5-14	15-17	18-20	21-23	24-26	27-29	30-32	33-35	36-38	39-45	All
3.80-4.00	--	**94%** 17/18	**85%** 86/101	**92%** 340/370	**94%** 1,308/1,388	**96%** 3,228/3,371	**97%** 3,677/3,795	**97%** 2,770/2,865	**96%** 1,348/1,405	**94%** 412/436	**96%** 13,190/13,754
3.60-3.79	--	**83%** 25/30	**82%** 95/116	**90%** 408/454	**93%** 1,358/1,465	**96%** 3,311/3,465	**96%** 3,569/3,708	**96%** 2,119/2,212	**95%** 810/849	**94%** 196/209	**95%** 11,897/12,517
3.40-3.59	**75%** 9/12	**71%** 20/28	**85%** 113/133	**83%** 331/399	**91%** 1,074/1,183	**94%** 2,500/2,663	**96%** 2,751/2,872	**96%** 1,373/1,433	**94%** 493/524	**91%** 89/98	**94%** 8,753/9,345
3.20-3.39	--	**65%** 15/23	**83%** 91/110	**80%** 291/362	**91%** 676/746	**95%** 1,244/1,315	**94%** 1,331/1,409	**96%** 626/655	**94%** 188/199	**90%** 35/39	**93%** 4,500/4,862
3.00-3.19	--	**80%** 20/25	**72%** 60/83	**84%** 187/222	**88%** 346/392	**93%** 506/546	**94%** 548/584	**96%** 241/251	**97%** 69/71	**86%** 12/14	**91%** 1,989/2,191
2.80-2.99	--	**75%** 9/12	**78%** 38/49	**81%** 110/136	**86%** 168/195	**89%** 187/211	**90%** 170/189	**93%** 64/69	**94%** 29/31	**100%** 10/10	**87%** 787/905
2.60-2.79		--	**73%** 19/26	**80%** 43/54	**85%** 67/79	**91%** 69/76	**90%** 54/60	**92%** 24/26	**80%** 8/10	--	**85%** 289/340
2.40-2.59		--	--	**80%** 12/15	**84%** 16/19	**83%** 20/24	**95%** 21/22	--	--		**86%** 86/100
2.20-2.39	--	--		**50%** 5/10	**82%** 9/11	--	--	--	--	--	**67%** 28/42
2.00-2.19	--	--	--	--	--	--	--				**58%** 7/12
1.47-1.99			--								--
All	**63%** 24/38	**76%** 113/149	**81%** 507/627	**85%** 1,729/2,026	**92%** 5,023/5,479	**95%** 11,074/11,682	**96%** 12,125/12,644	**96%** 7,226/7,521	**95%** 2,949/3,094	**93%** 756/809	**94%** 41,526/44,069

Notes:

1. Blue shading = graduation rates of 90-100%; Green shading = graduation rates of 80-89%; Orange shading = graduation rates of 70-79%.

2. Dashes = cells with fewer than ten observations; blank cells = cells with zero observations.

3. Students enrolled in joint programs (e.g., MD-PhD), participating in special research/non-research studies, or deceased are not included in this table.

4. For students who took the MCAT exam multiple times, the most recent MCAT total score at the time of matriculation was used in this analysis.

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AAMC Mission

The AAMC serves and leads the academic medicine community to improve the health of all.

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Our Goal

We are not selecting medical students, but rather the future physicians who will lead the country in an rapidly evolving 21st Century healthcare system.

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Q & A

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Tomorrow's Doctors, Tomorrow's Cures

Learn

Serve

Lead

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Table 5. Percentage of 2004-2006 Students Who Withdrew or Were Dismissed from Medical School for Academic Reasons, by MCAT Total Score and Undergraduate GPA Range

	MCAT Total										
GPA Total	**5-14**	**15-17**	**18-20**	**21-23**	**24-26**	**27-29**	**30-32**	**33-35**	**36-38**	**39-45**	**All**
3.80-4.00	--	**0%** 0/18	**2.9%** 3/105	**2.1%** 8/382	**1.3%** 19/1,433	**0.8%** 29/3,534	**0.4%** 16/4,209	**0.4%** 13/3,381	**0.3%** 5/1,789	**0%** 0/604	**0.6%** 94/15,460
3.60-3.79	--	**3.2%** 1/31	**1.7%** 2/118	**3.4%** 16/472	**2.3%** 35/1,517	**1.2%** 45/3,611	**0.9%** 35/4,047	**0.5%** 12/2,550	**0.2%** 2/1,057	**0%** 0/286	**1.1%** 149/13,698
3.40-3.59	**0%** 0/13	**10.7%** 3/28	**3.7%** 5/136	**5.8%** 24/414	**3.4%** 42/1,230	**1.6%** 46/2,824	**0.9%** 28/3,109	**0.8%** 13/1,647	**1.5%** 9/616	**1.7%** 2/120	**1.7%** 172/10,137
3.20-3.39	--	**13.0%** 3/23	**6.1%** 7/114	**8.8%** 34/385	**3.0%** 23/774	**1.8%** 25/1,373	**1.3%** 20/1,512	**1.1%** 8/741	**0.4%** 1/223	**0%** 0/46	**2.3%** 121/5,195
3.00-3.19	--	**4.0%** 1/25	**12.0%** 10/83	**5.7%** 13/228	**4.6%** 19/411	**2.2%** 13/580	**1.8%** 11/623	**0.4%** 1/279	**0%** 0/84	**0%** 0/17	**3.0%** 69/2,333
2.80-2.99	--	**25.0%** 3/12	**7.8%** 4/51	**7.9%** 11/140	**8.5%** 17/201	**3.2%** 7/220	**2.0%** 4/205	**1.3%** 1/79	**0%** 0/32	**0%** 0/10	**4.9%** 47/953
2.60-2.79		--	**7.1%** 2/28	**12.3%** 7/57	**6.1%** 5/82	**2.5%** 2/79	**1.5%** 1/66	**3.6%** 1/28	**9.1%** 1/11	--	**5.8%** 21/360
2.40-2.59		--	--	**13.3%** 2/15	**10.0%** 2/20	**12.0%** 3/25	**0.0%** 0/23	--	--		**8.7%** 9/104
2.20-2.39	--	--		**30.0%** 3/10	**9.1%** 1/11	--	--	--	--	--	**16.3%** 7/43
2.00-2.19	--	--	--	--	--	--	--	--			**23.1%** 3/13
1.47-1.99			--								--
All	**7.7%** 3/39	**9.3%** 14/150	**5.7%** 37/644	**5.6%** 119/2,107	**2.9%** 163/5,680	**1.4%** 172/12,257	**0.8%** 115/13,799	**0.6%** 49/8,717	**0.5%** 18/3,818	**0.3%** 3/1,086	**1.4%** 693/48,297

Notes:

1. Blue shading = graduation rates of 0-10%; Green shading = graduation rates of 10.1-20%; Orange shading = graduation rates of 20.1-30%.

2. Dashes = cells with fewer than ten observations; blank cells = cells with zero observations.

3. For students who took the MCAT exam multiple times, the most recent MCAT total score at the time of matriculation was used in this analysis.

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Core principles of a holistic review process

1 In a holistic admission process, selection criteria are broad-based, clearly linked to school mission and goals, and promote diversity as an essential element to achieving institutional excellence

2 A balance of experiences, attributes, and academic metrics (EAM) is

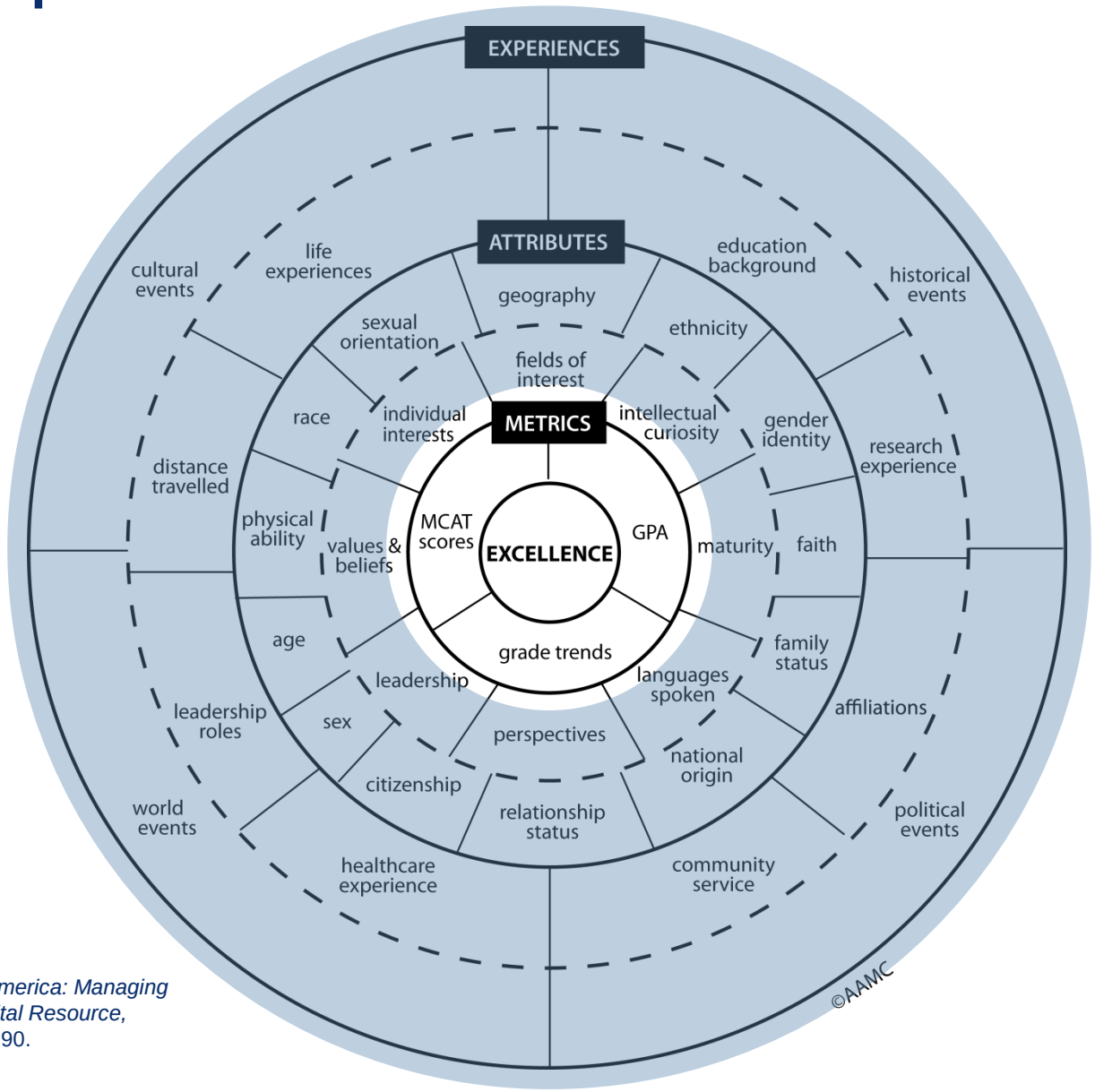
- used to assess applicants with the intent of creating a richly diverse interview and selection pool, and student body;
- applied equitably across the entire candidate pool; and
- grounded in data that provide evidence supporting the use of selection criteria beyond grades and test scores.

3 Admission staff and committee members give individualized consideration to how each applicant may contribute to the medical school learning environment and practice of medicine, weighing and balancing the range of criteria needed in a class to achieve the outcomes desired by the school.

4 Race and ethnicity may be considered as factors when making admission-related decisions only when aligned with mission-related educational interests and goals associated with student diversity; and when considered as part of a broader mix of factors, which may include personal attributes, experiential factors, demographics, or other considerations.*

* Under federal law (and where permitted

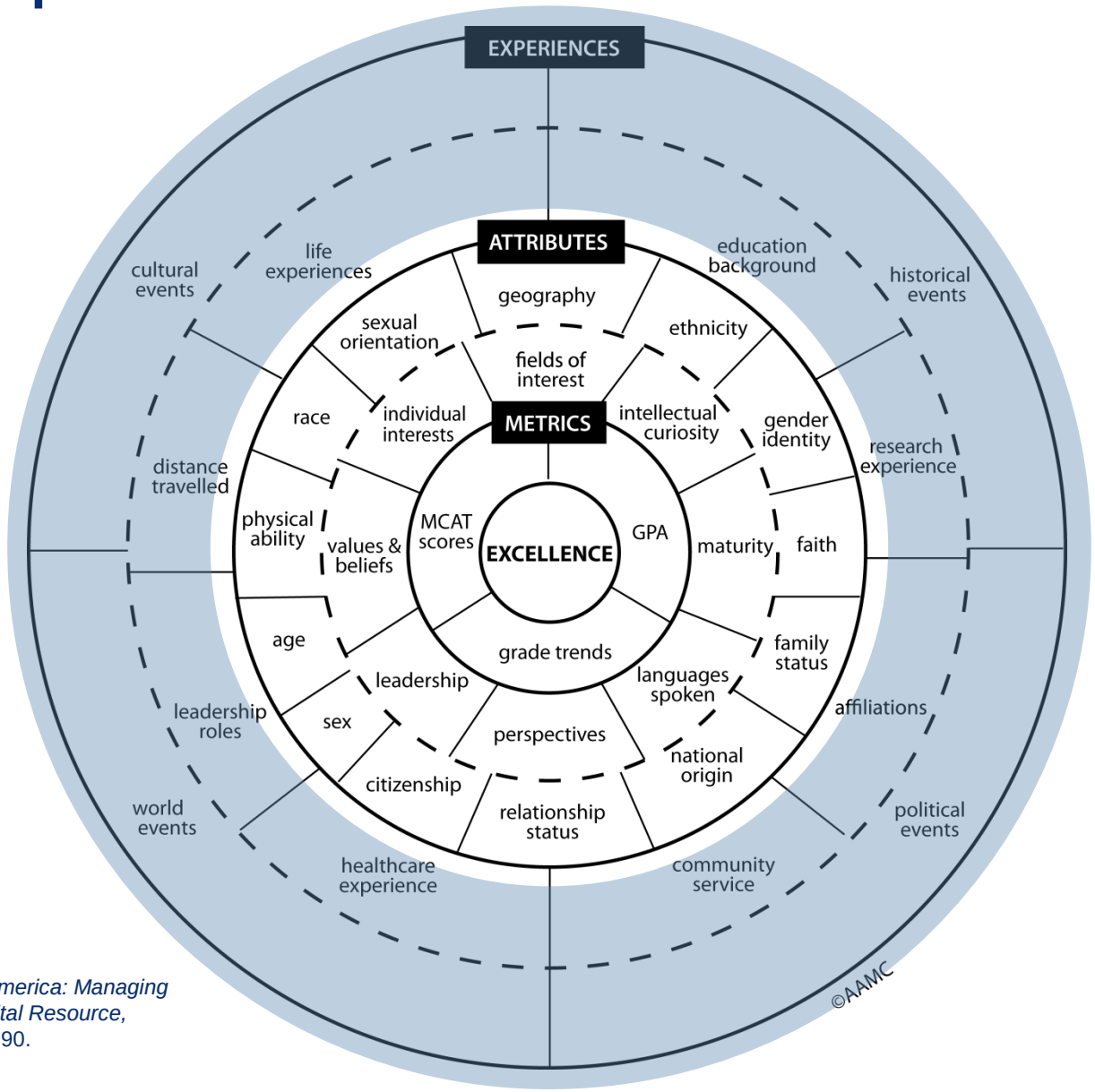
Multiple Dimensions of Diversity



Adapted from *Workforce America: Managing Employee Diversity as a Vital Resource,* McGraw Hill Publishing, 1990.

AAMC

Multiple Dimensions of Diversity



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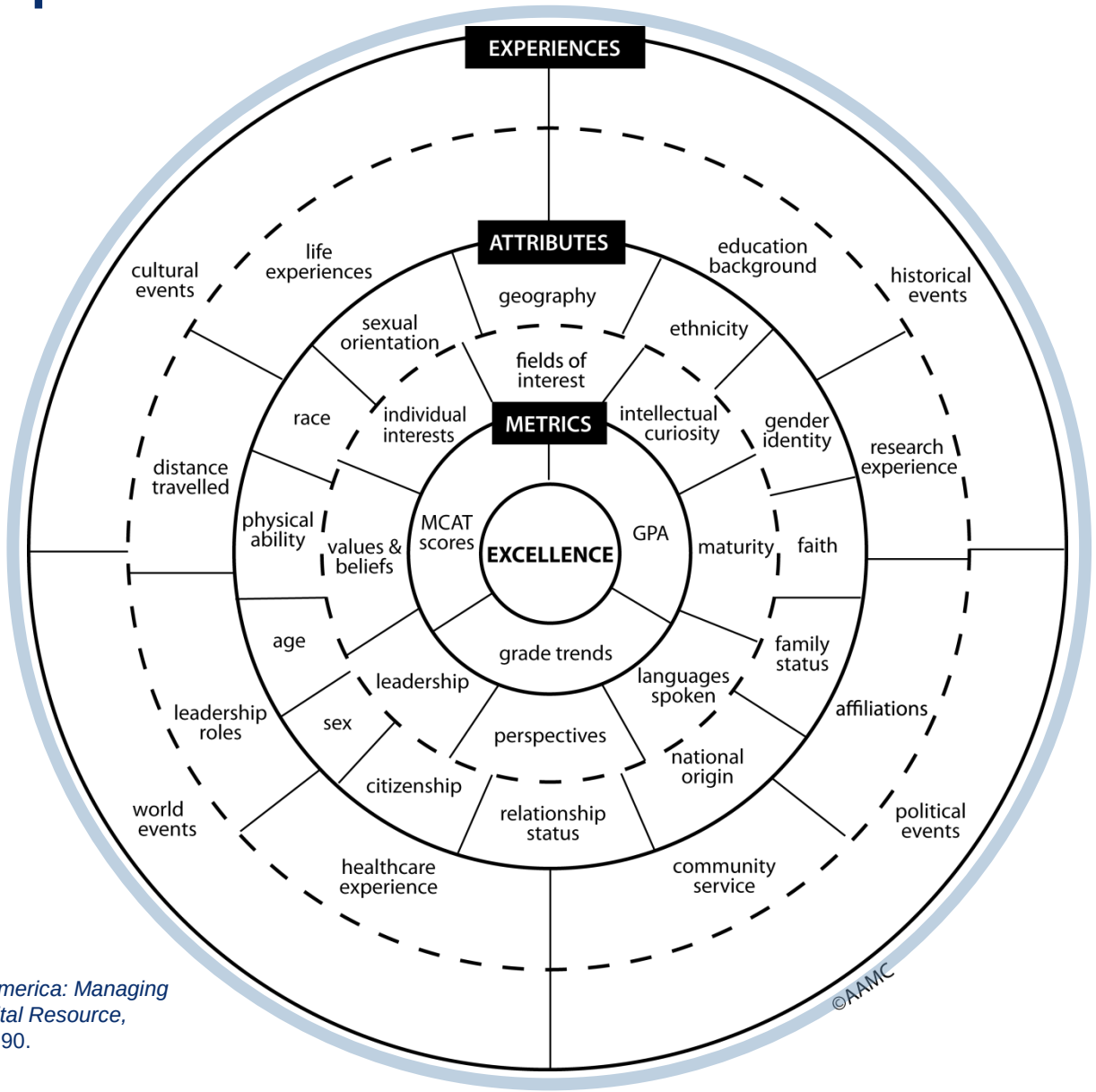

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