GATEKEEPERS of a SO-CALLED MERITOCRACY

G. R. Tremblay
Harvard-Smithsonian Center for Astrophysics
ON A PLATE
A SHORT STORY
ABOUT PRIVILEGE
This is Richard. His parents are doing ok.

And this is Paula. Her parents? Not so much.
Richard's house is warm and dry. His shelves are full of books and his fridge is full of food.

Paula's house is full of people and not much else. It's damp and noisy and she keeps getting sick.
RICHARD’S PARENTS WILL DO ANYTHING FOR THEIR BABY...

Good boy!

Clever!

...AND SO WILL PAULA’S. THAT’S WHY THEY’RE WORKING TWO JOBS.
Richard goes to a great school. Well resourced, good kids. His teachers love their job.

At Paula's school, the class sizes are large, the school is underfunded, and looks it. Her teachers are tired, stretched thin from the stress.

Oh man, I need a new job...
So maybe we can see why the expectations set for Richard...

B+? Oh dear, we need to get you a tutor...

...might be slightly different to those set for Paula...

B? Hey, not bad!
...and over the years all these little differences...

(PARENTS PAYING FOR UNI)

(JUGGLING WORK AND POLYTECH, STILL GETTING IN DEBT)
I have friends working there - I'll have a word, and get you an internship.

Thanks Dad.

...they start to add up, to build into something bigger.

You should be finishing your studies, not looking after me...

Dad, you're sick.
Yep, the loan is approved. Congratulations!

AND BECAUSE EACH LITTLE DIFFERENCE SNEAKS BY UNNOTICED...

Look, we just can’t help you. Maybe try Eazee Finance?
Then maybe Richard starts to believe that he deserves to be on top. That he did it all himself.

Oh you're Roger's boy right? I've heard good things, keeping my eye on you...

And maybe Paula starts to settle. Learns to 'know her place'.

OK, you've got the job, but I'm watching you sweetie...
What is the secret to your success?

Um... excuse me...

But I hope not.
Less whining, more hard work I say. I'm sick of people asking for handouts. No one ever handed me anything on plate.

I really hope not.

Further reading: Look up Auckland City Mission's 'Speaking for Ourselves' booklet.
No nation can enslave a race of people for hundreds of years, set them “free” bedraggled and penniless, pit them, without assistance in a hostile environment, against privileged victimizers, and then reasonably expect the gap between the heirs of the two groups to narrow. *Lines, begun parallel and left alone, can never touch.*

R. Robinson
Enormous debate over the drivers of this:

SAT scores vs. family income, Whites and Blacks (2008)

Data: The College Board
A MILLION tiny FEEDBACK LOOPS
SPENDING PER STUDENT, BY SCHOOL DISTRICT

Adjusted for regional differences, for primary and unified school districts

National average: $11,841

-33% -10% +10% +33% of national average

[Map showing spending per student by school district with color-coded data.]
The series was reported by Akilah Johnson, Todd Wallack, Nicole Dungca, Liz Kowalczyk, Andrew Ryan, Adrian Walker, and editor Patricia Wen. Today's story was written by Johnson.
Median net worth in Boston

White Families

$247,500
Median net worth in Boston

White Families

$247,500

Black Families

$8
The Boston Globe

@BostonGlobe


Todd Wallack

@TWallack

A reader just asked me whether it was a typo when @GlobeSpotlight wrote that non-immigrant African-Americans in Greater Boston have a median net worth of $8. Sadly, no. apps.bostonglobe.com/spotlight/bost…

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8:05 AM - 10 Dec 2017

11,744 Retweets 9,673 Likes
Discussion fodder

In astronomy, how might our various “calorimeters of merit” unintentionally drive disparities?
Physics is among the least diverse of the sciences.

Physics & Astronomy have least URM representation among STEM fields

Credit: APS/Source: IPEDS Completion Survey
Physics & Astronomy have least URM representation among STEM fields

Credit: APS/Source: IPEDS Completion Survey

US pop. age 21-24
US pop. age 25-29

Slide courtesy Casey Miller
average of 2006-2008

Credit: APS/Source: IPEDS Completion Survey
Fraction of STEM Bachelors degrees earned by Women

Physics is among the least diverse of the sciences.

Credit: APS/Source: IPEDS Completion Survey

Slide courtesy Casey Miller
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*Example:* GRADES
Grade inflation undermines URM participation

Recent GPA Trends Nationwide
Four-Year Colleges & Universities

Average GPA

Year
1983
1988
1993
1998
2003
2008
2013

All Schools
Public Schools
Private Schools

State DOE data, via gradeinflation.com
Grade inflation undermines URM participation

State DOE data, via gradeinflation.com

Slide courtesy Casey Miller
## Most URMs attend State Colleges

<table>
<thead>
<tr>
<th>URM Engineering #BA/BS</th>
<th>Rank</th>
<th>URM Physical Sciences #BA/BS</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Florida (240/yr)</td>
<td>1</td>
<td>Florida International University (85/yr)</td>
</tr>
<tr>
<td>Florida International University</td>
<td>2</td>
<td>Xavier University of Louisiana</td>
</tr>
<tr>
<td>Texas A &amp; M University-College Station</td>
<td>3</td>
<td>The University of Texas at Austin</td>
</tr>
<tr>
<td>University of Central Florida</td>
<td>4</td>
<td>University of California-Santa Barbara</td>
</tr>
<tr>
<td>Georgia Institute of Technology-Main Campus</td>
<td>5</td>
<td>Texas A &amp; M University-College Station</td>
</tr>
<tr>
<td>California State Polytechnic University-Pomona</td>
<td>6</td>
<td>The University of Texas at El Paso</td>
</tr>
<tr>
<td>The University of Texas at El Paso</td>
<td>7</td>
<td>University of California-Los Angeles</td>
</tr>
<tr>
<td>The University of Texas at Austin</td>
<td>8</td>
<td>University of Florida</td>
</tr>
<tr>
<td>North Carolina A &amp; T State University</td>
<td>9</td>
<td>Spelman College</td>
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<tr>
<td>The University of Texas-Pan American</td>
<td>10</td>
<td>University of California-Irvine</td>
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<tr>
<td>Cal Polytechnic State University-San Luis Obispo</td>
<td>11</td>
<td>University of North Carolina at Chapel Hill</td>
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<tr>
<td>The University of Texas at San Antonio</td>
<td>12</td>
<td>University of California-Santa Cruz</td>
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<tr>
<td>Arizona State University-Tempe</td>
<td>13</td>
<td>University of Arizona</td>
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<tr>
<td>University of California-San Diego</td>
<td>14</td>
<td>University of New Mexico-Main Campus</td>
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<td>University of Houston</td>
<td>15</td>
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<td>Morgan State University</td>
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<td>Jackson State University</td>
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<tr>
<td>Prairie View A &amp; M University</td>
<td>18</td>
<td>The University of Texas at San Antonio</td>
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<tr>
<td>Alabama A &amp; M University</td>
<td>19</td>
<td>Columbia University in the City of New York</td>
</tr>
<tr>
<td>North Carolina State University at Raleigh</td>
<td>20</td>
<td>University of Memphis</td>
</tr>
<tr>
<td>Southern University and A &amp; M College</td>
<td>21</td>
<td>CUNY City College</td>
</tr>
<tr>
<td><strong>Howard University</strong></td>
<td>22</td>
<td>CUNY Graduate School and University Center</td>
</tr>
<tr>
<td><strong>Tuskegee University</strong></td>
<td>23</td>
<td>Savannah State University</td>
</tr>
<tr>
<td>University of Maryland-College Park</td>
<td>24</td>
<td>Alabama A &amp; M University</td>
</tr>
<tr>
<td>University of South Florida-Main Campus</td>
<td>25</td>
<td>Georgia Southern University</td>
</tr>
<tr>
<td>Virginia Tech (38/yr)</td>
<td>26</td>
<td>Tennessee State University (15/yr)</td>
</tr>
</tbody>
</table>

Most URMs attend State Colleges.
“You can’t do that, he’s a Senator’s son”

-An actual Ivy League Dean
In astronomy, how might our various “calorimeters of merit” unintentionally drive disparities?

Example:

GRE SCORES
Physical Sciences

GRE Quantitative Score (2006-2007)

SOURCE: ETS, "Factors that can influence performance on the GRE general test 2006-2007"

Slide courtesy Casey Miller
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Slide courtesy Casey Miller
Controlling for undergraduate GPA

These students had ~identical GPAs equivalent to an A

SOURCE: ETS, "Factors that can influence performance on the GRE general test 2006-2007"
Testing disparity exists across all ages

SOURCE: Total Group Profile Report, College Board, 2009 College-Bound Seniors.

Slide courtesy Casey Miller
Testing disparity exists across all ages


Slide courtesy Casey Miller
Yes, these plots look eerily similar..


Slide courtesy Casey Miller
Cutoffs are nevertheless used *all the time*
180 US Physics PhD Programs

96% require the General GRE
~25% of these have stated minimum scores
For admission, with the median being 700

~48% require the Physics GRE
~50% of these have stated minimum scores
For admission, with the median being 600
GRE Physics Subject Test

Fraction Above the Cut-off

- Fraction (White) 7172
- Fraction (Hispanic) 467
- Fraction (Black) 155
- Fraction (Asian) 821

0.61 (Asian)
0.44 (White)
0.34 (Hispanic)
0.09 (Black)

Cut-off on GRE Physics

SOURCE: ETS (via APS)

Slide courtesy Casey Miller
Graph showing the fraction of test-takers above the cut-off on the GRE Physics Subject Test. The y-axis represents the fraction above the cut-off, and the x-axis represents the cut-off score on the GRE Physics. The graph includes two lines: one in red labeled 'Fraction (M)' and one in blue labeled 'Fraction (F).'

- At a cut-off of 650, the fraction of test-takers is 0.28 (F).
- At a cut-off of 0.50, 21% of test takers were female.

Source: ETS (via APS)

Slide courtesy Casey Miller
From ETS document
"Factors that can influence performance on the GRE general test 2006-2007"


- Asian Am.: N = 1474
- White: N = 14957
- Other Hispanic: N = 393
- Mexican Am.: N = 398
- Native Am.: N = 90
- African Am.: N = 1055
- Puerto Rican: N = 260
- Men: N = 12492
- Women: N = 7104

Slide courtesy Casey Miller
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