National Academies STEM Workforce Summit

September 21-22, 2015

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PIAAC and Policy Research

- ETS Policy Research using PIAAC data
  - "*America's Skills Challenge: Millennials and the Future*," written by Madeline Goodman, Anita Sands and Richard Coley (retired), published by the ETS Center for Research on Human Capital and Education
- PIAAC
  - what is PIAAC
  - which countries participate
  - what is assessed
  - what can the data tell us

What is PIAAC?

- The OECD contracted with ETS to assemble and lead an international consortium in the design, development and implementation of a new survey of adult skills.
- PIAAC is the largest and most innovative survey of adults ever undertaken.
- Unlike school-based surveys, which focus on specific ages or grades of in-school students, PIAAC was designed as a household study of nationally representative samples of adults, 16-65 years of age.
- It is the first large-scale survey to be designed as a computer delivered assessment. This allowed us to: broaden what could be measured, implement computer scoring for all items, and incorporate a multi-stage adaptive testing algorithm.

Which countries participate?

Round 1 Countries

Australia
Austria
Belgium
Canada
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Germany
Ireland
Italy
Japan
Korea, Rep of
Netherlands
Norway
Poland
Russian Federation
Slovak Republic
Spain
Sweden
United Kingdom
United States

Round 2 Countries

Chile
Greece
Indonesia
Israel
Lithuania
New Zealand
Singapore
Slovenia
Turkey

Round 3 Countries

Argentina (Buenos Aires)
Colombia
Ecuador
Hungary
Kazakhstan
Mexico
Peru

What Does PIAAC Assess?

The main instruments in PIAAC include …

- Background Questionnaire
- Reading Components
- Literacy
- Numeracy
- Problem Solving in Technology Rich Environments

What PIAAC data can tell us?

- provide a better understanding of the distributions of key skills and proficiencies both at the national and international levels
- shed light on the extent skills translate into better opportunities for individuals & economies
- help evaluate how effective our education and training systems, and our social and workplace practices are in developing the required skills and proficiencies

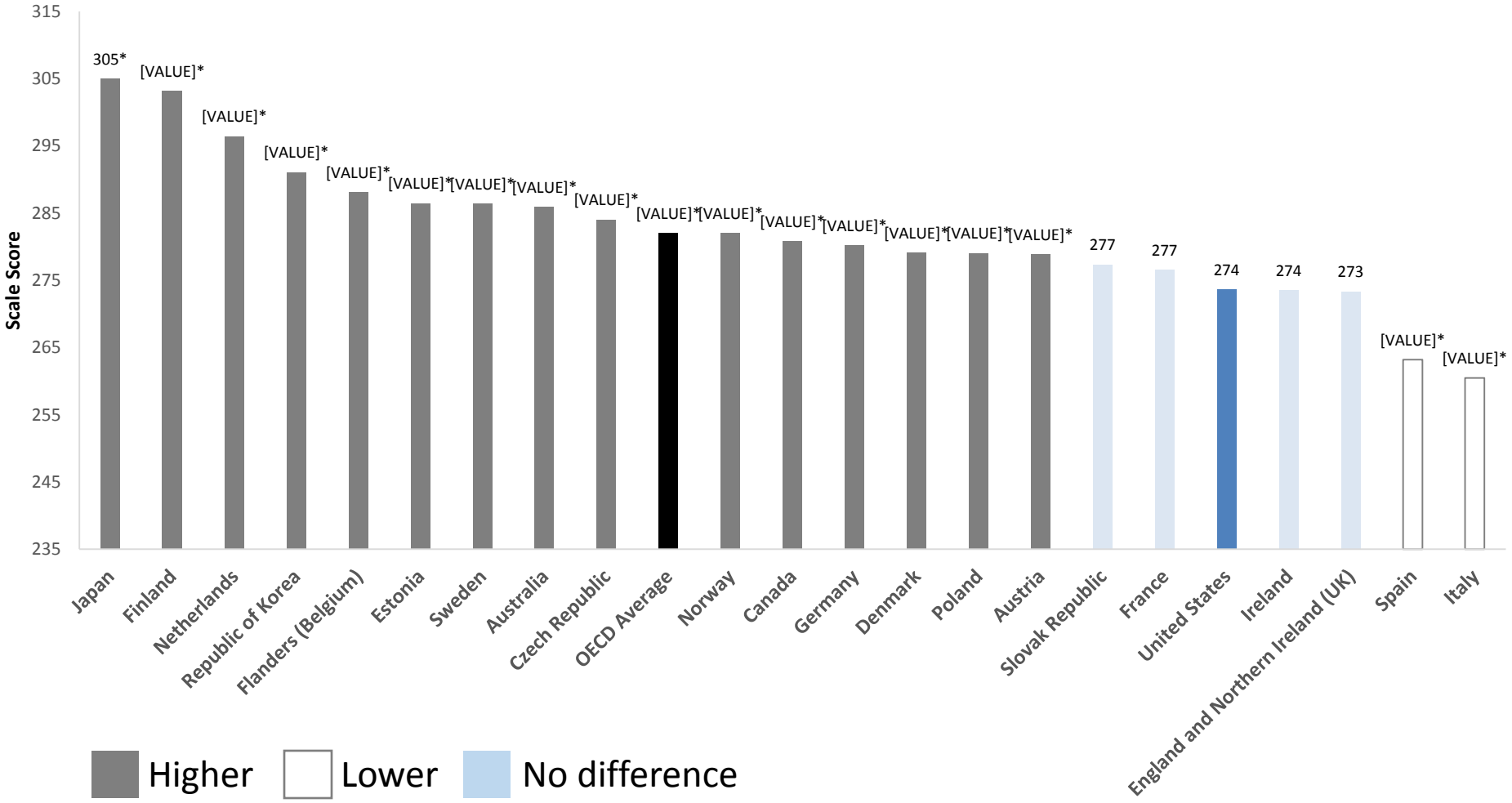
Who are the Millennials?

- Respondents who were born after 1980
- 16–34 years of age at time of PIAAC

Why are They so Important?

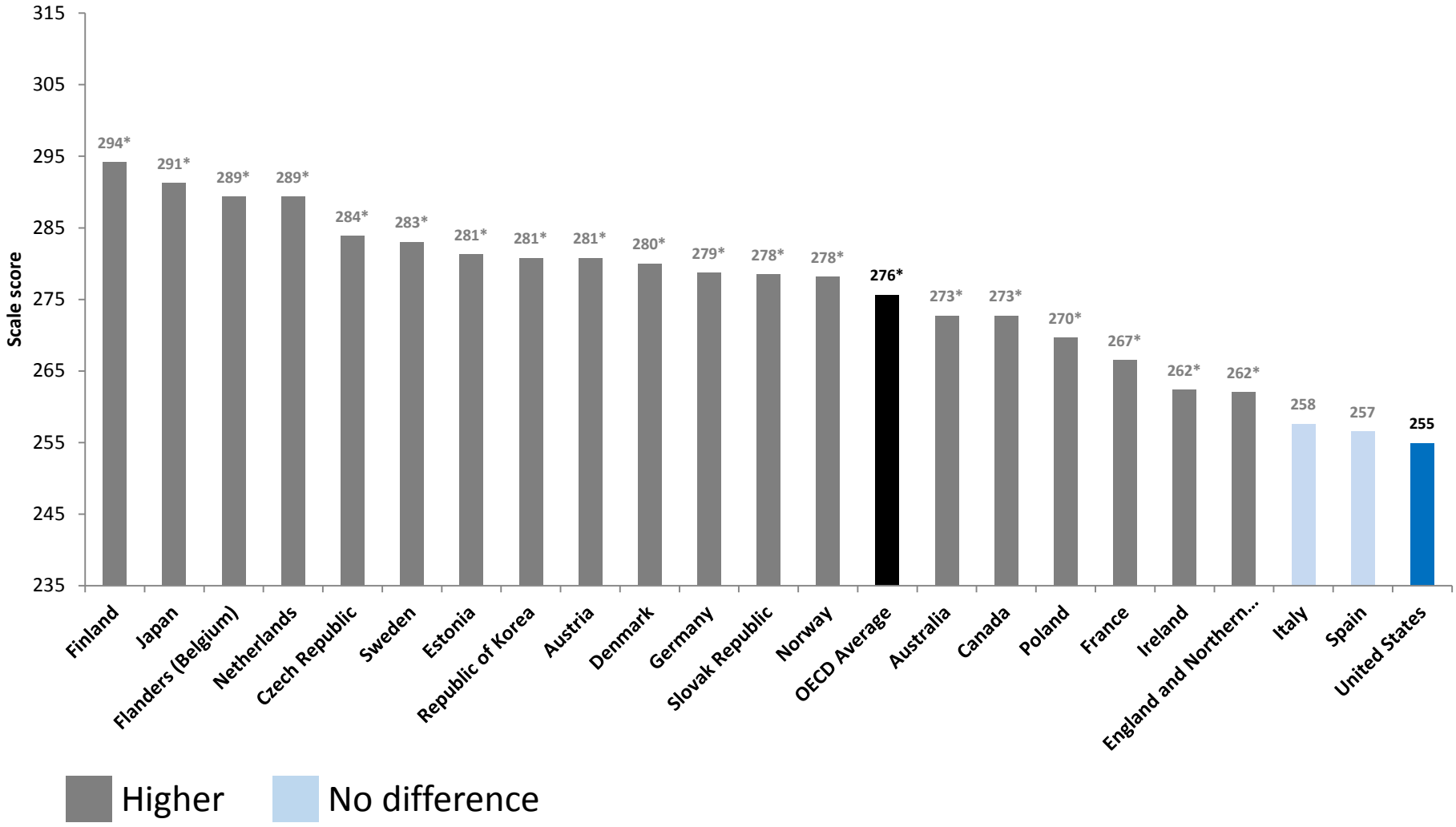
- They are the most recent products of our educational systems
- According to various reports they have attained the most years of schooling of any previous cohort
- They will be in the labor force for the next 40–50 years
- Will shape the economic, political and social landscape

In literacy, U.S. millennials scored lower than 15 of 22 countries. Only millennials in Spain and Italy scored lower.



* Significantly different ($p < .05$) from PIAAC (2012).

In numeracy, U.S. millennials ranked last, along with Italy and Spain.



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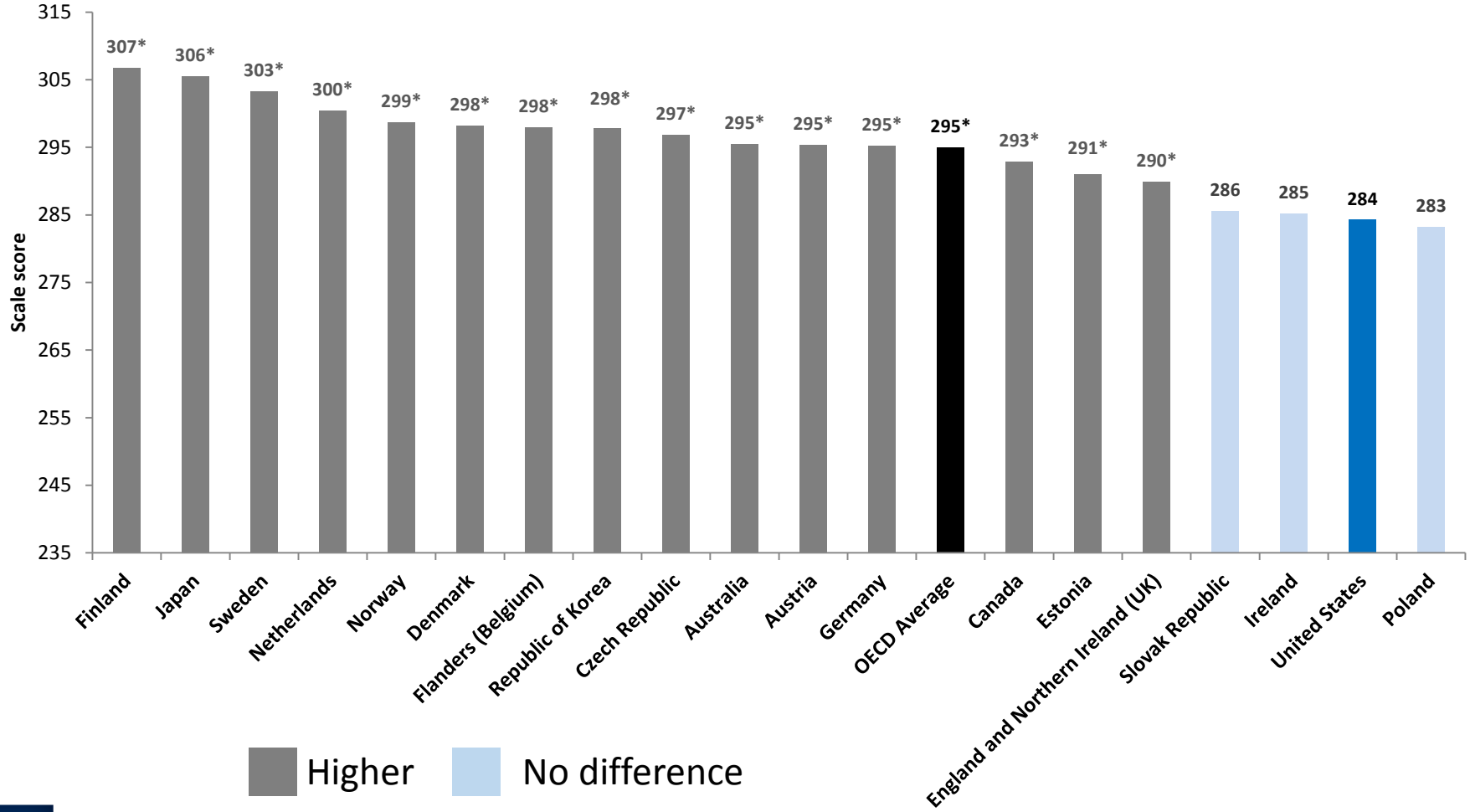
In PS-TRE, U.S. millennials ranked last, along with the Slovak Republic, Ireland and Poland.



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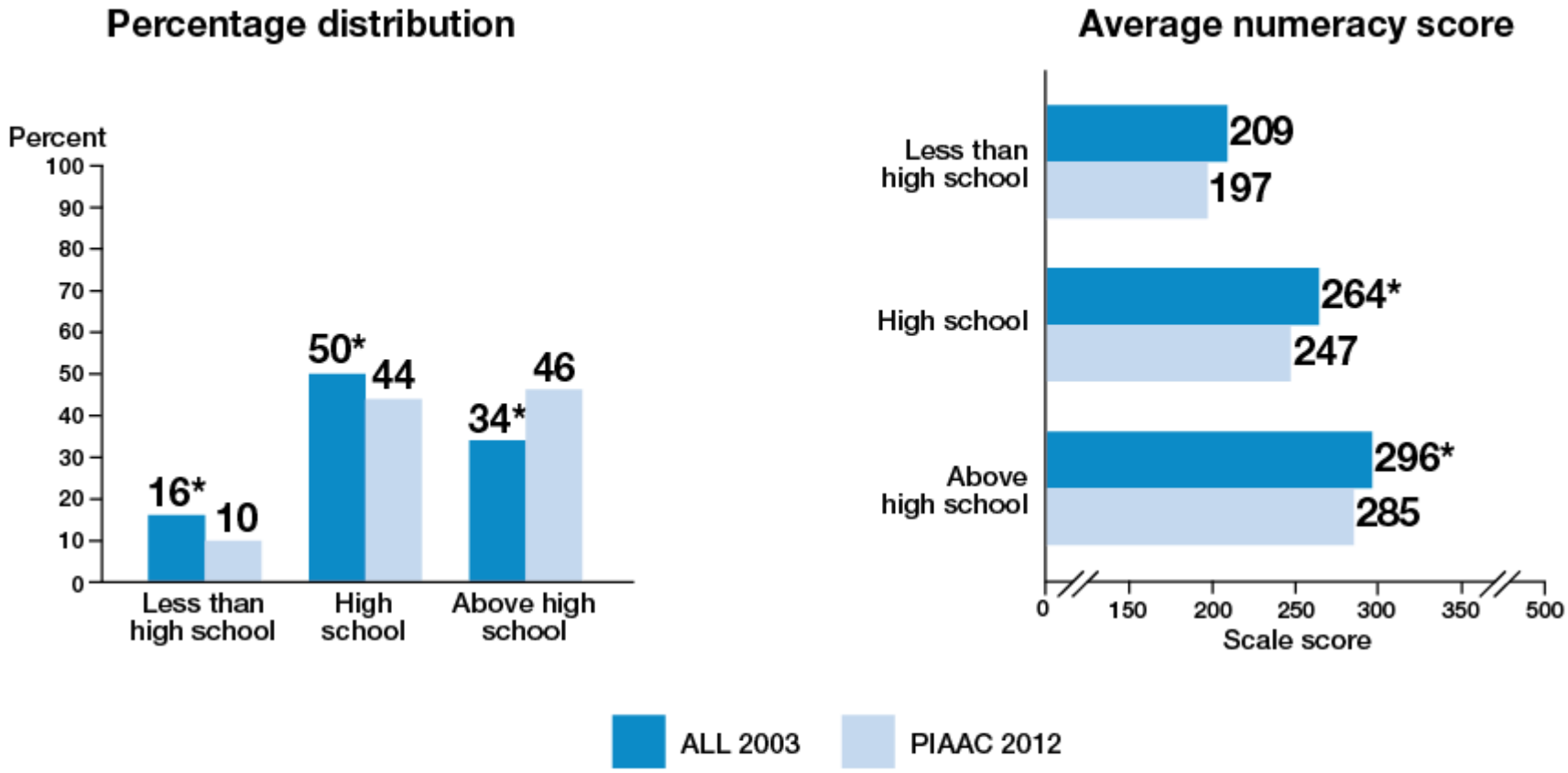
U.S. millennials attain more education while skills decline



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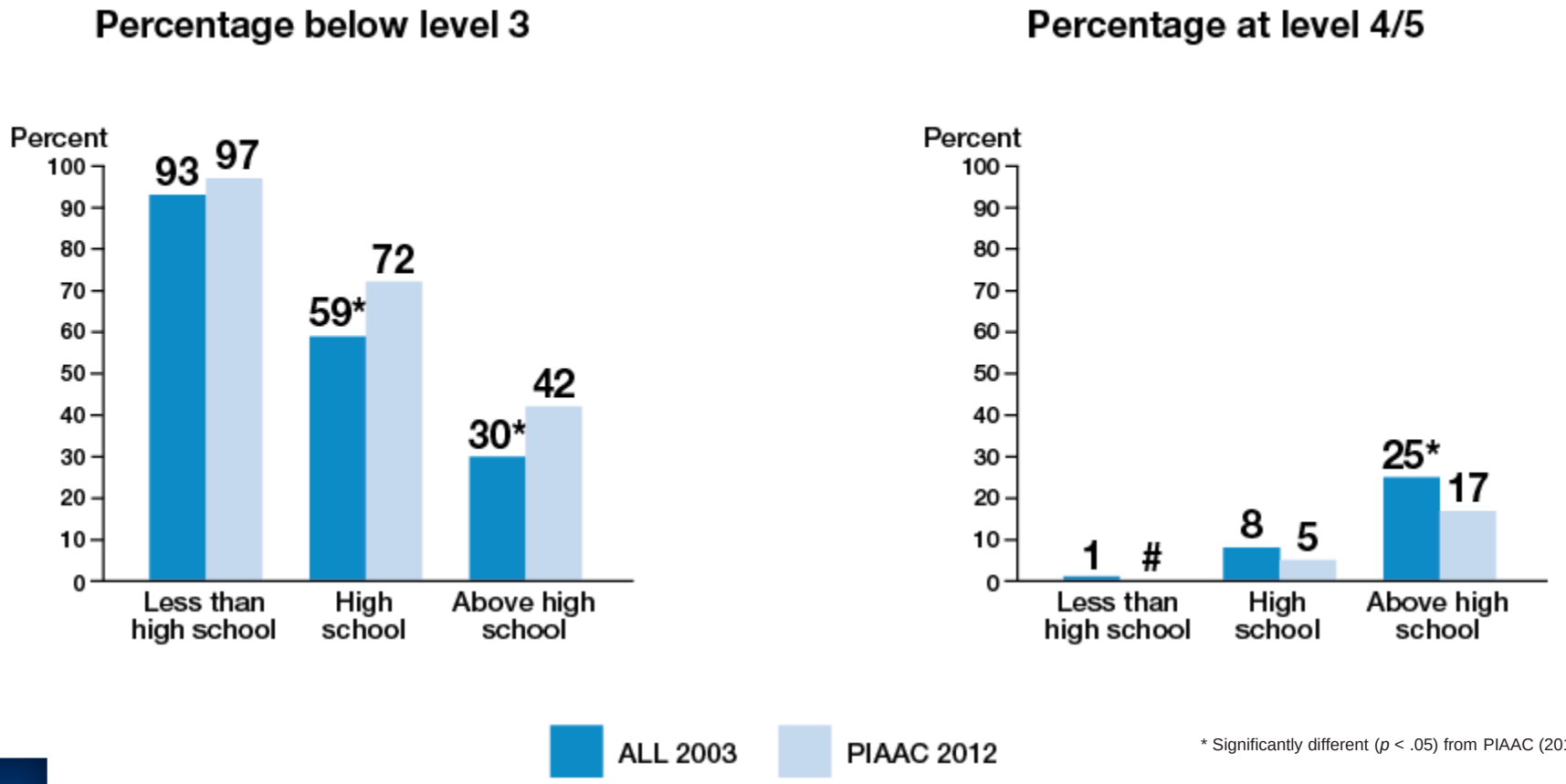
Percent of millennials below level 3 in numeracy increases while percent in highest levels falls



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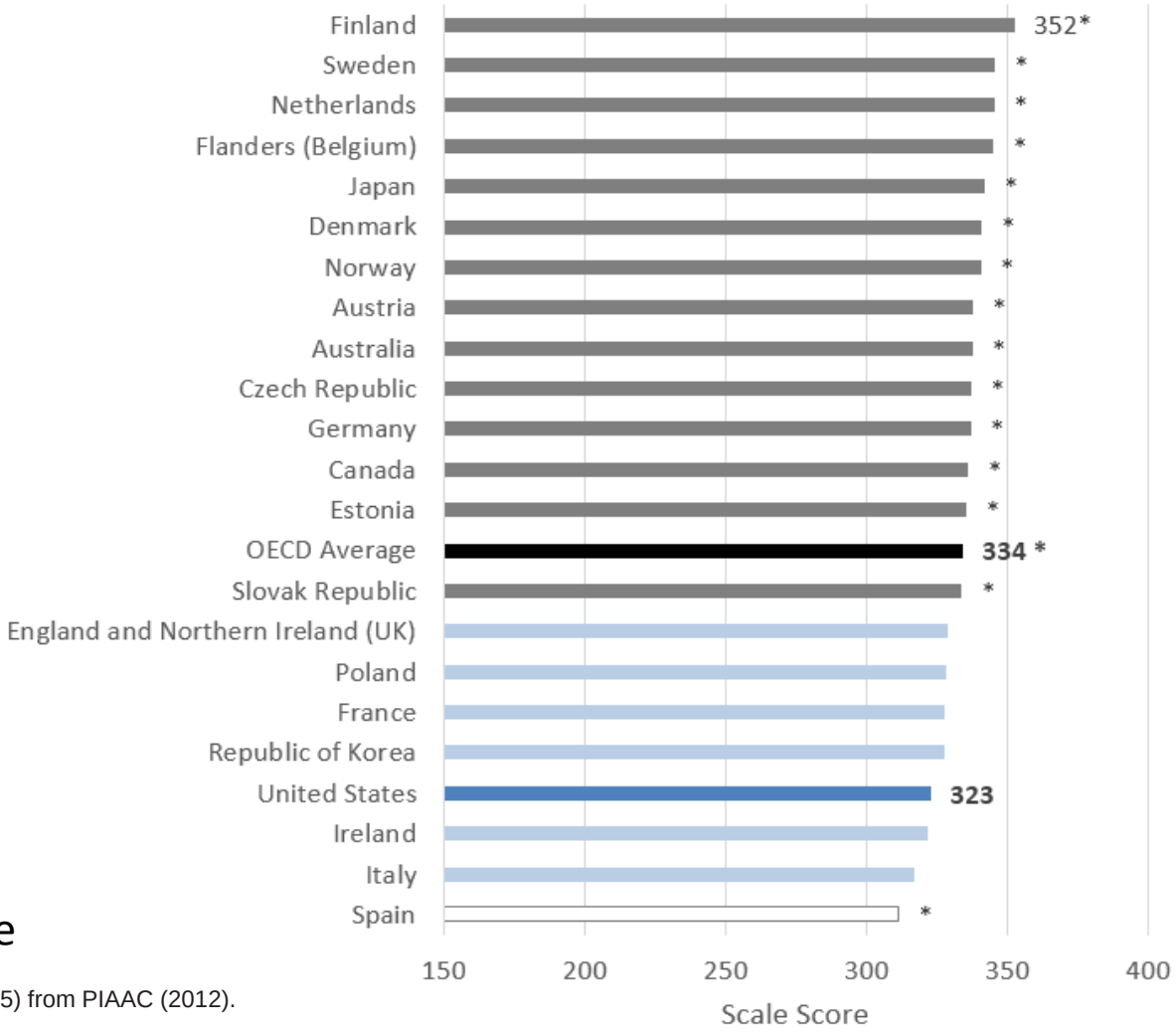
U.S. millennials at the 90th percentile in numeracy scored higher than their counterparts in only one country.



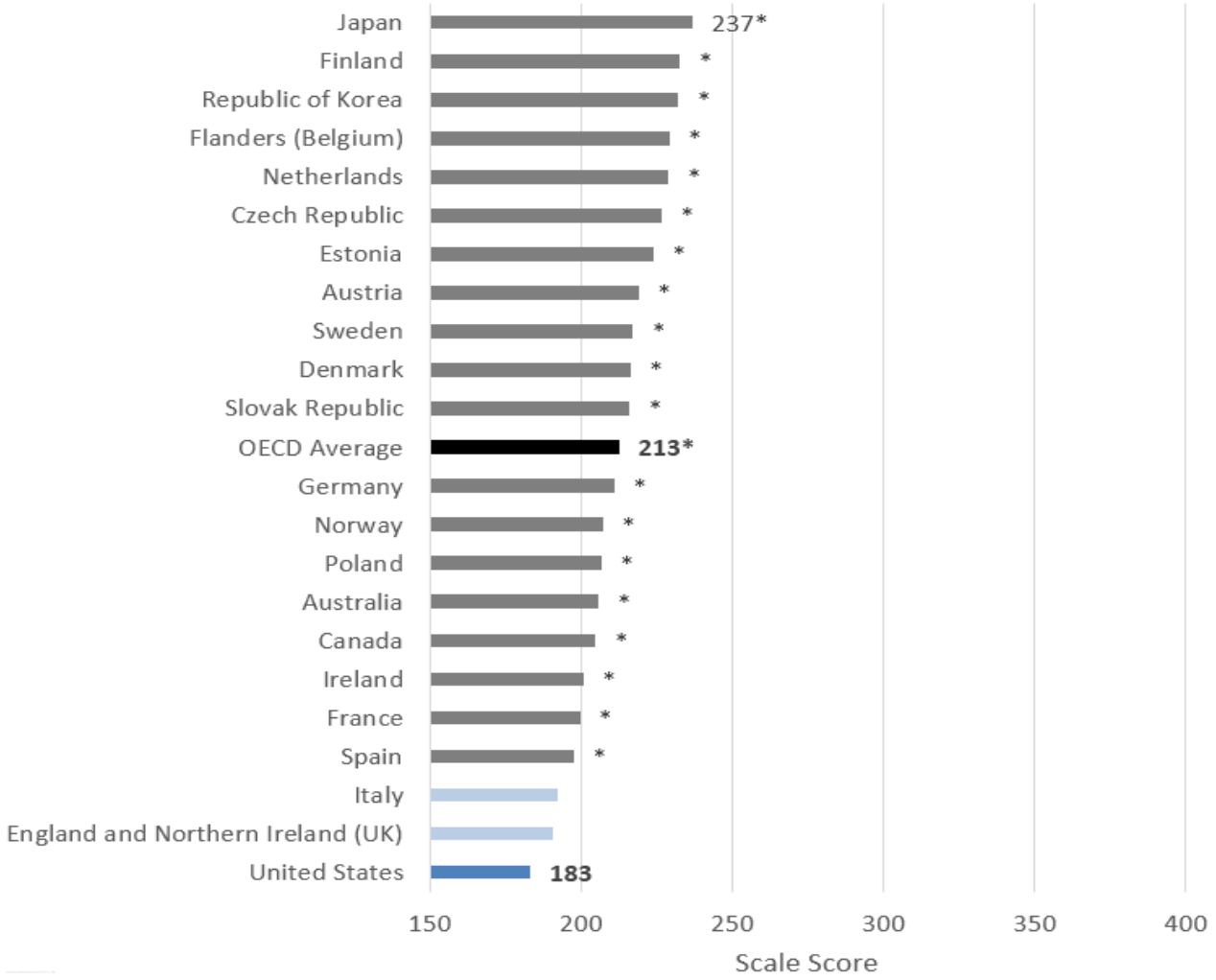
Higher

Lower

No difference

* Significantly different ($p < .05$) from PIAAC (2012).

Lower performers (10th percentile) - no country scores lower than the U.S. in numeracy



Higher

No difference

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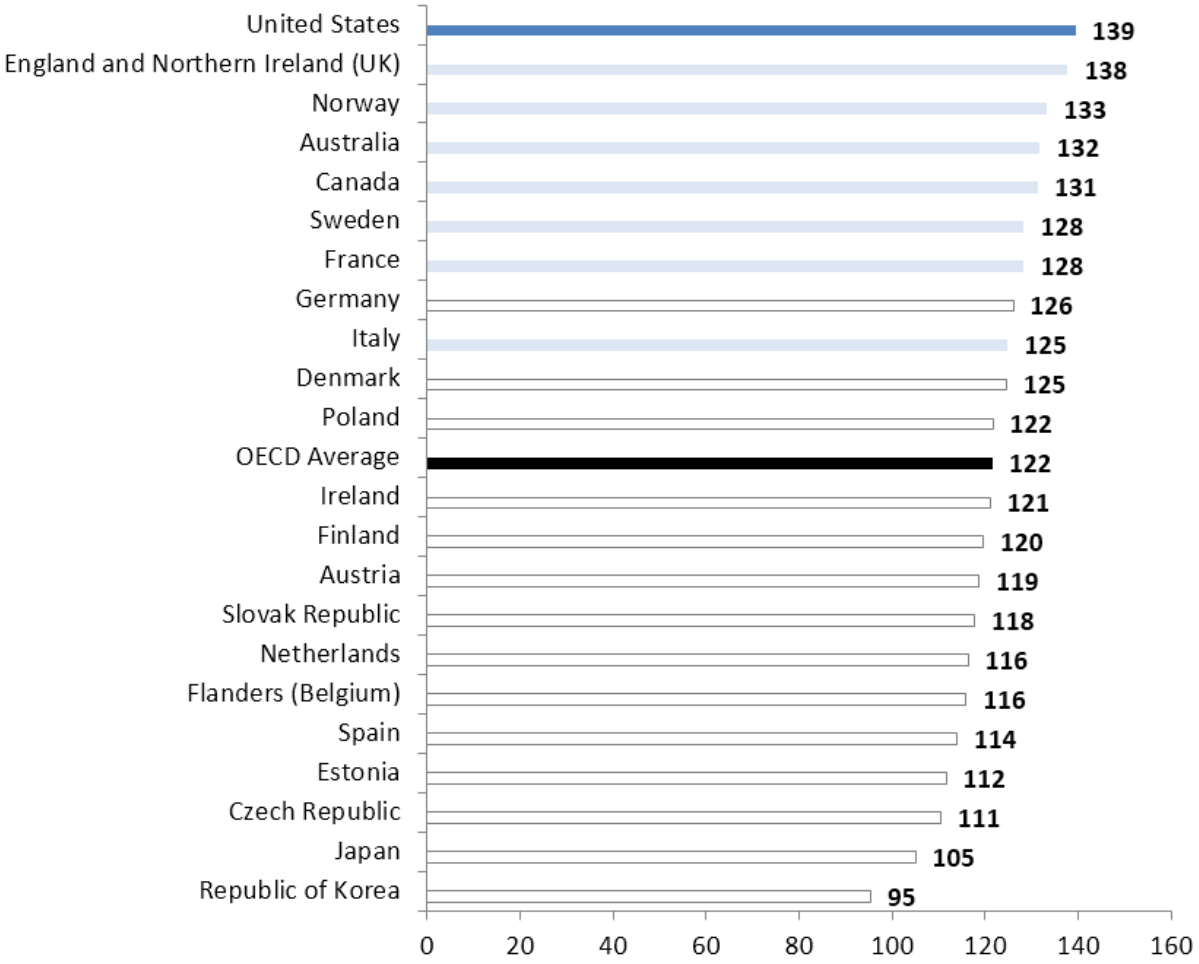
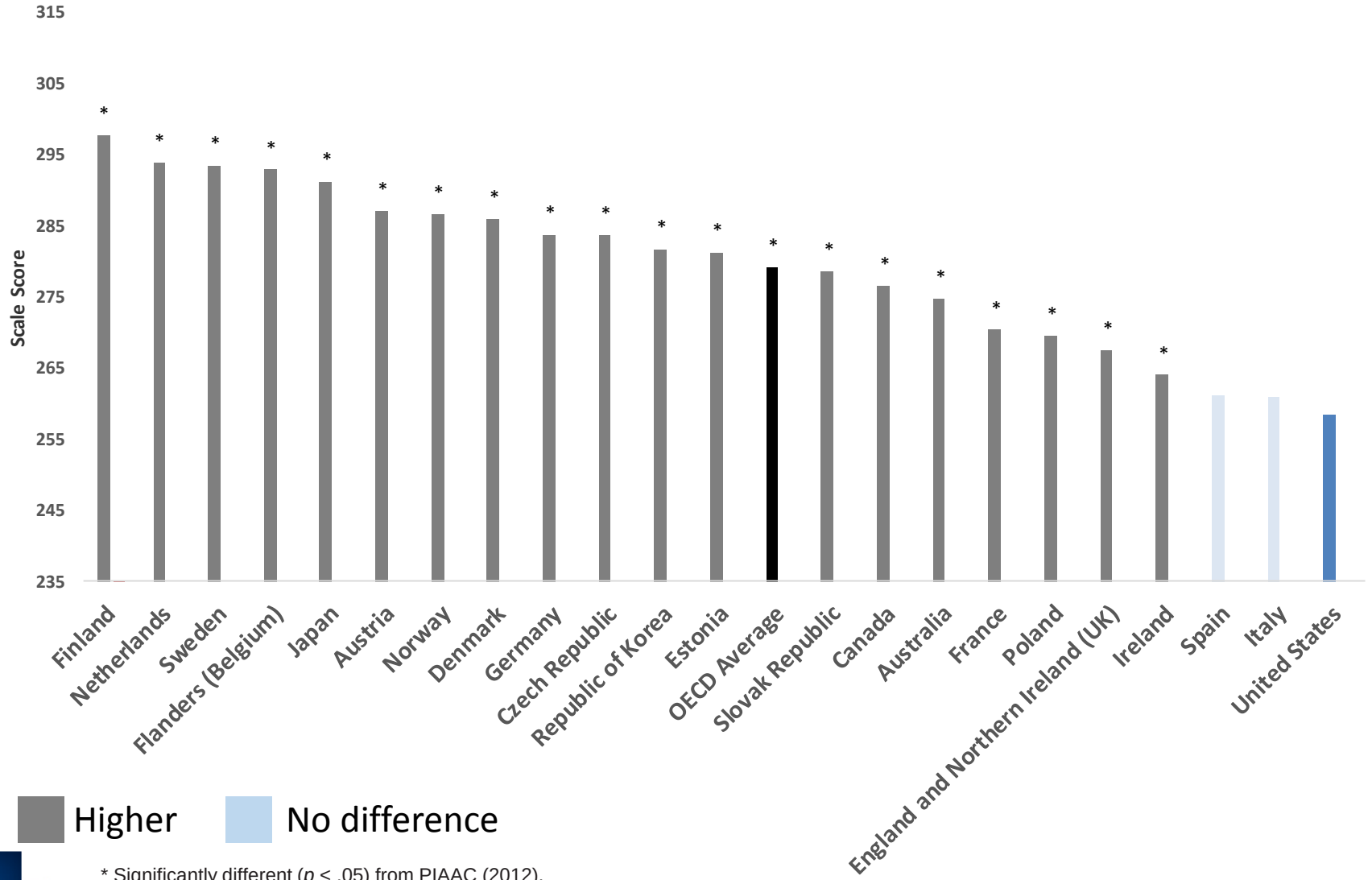
U.S. gap between high and low performers in numeracy is among the largest.



Native-born U.S. millennials do not score higher in numeracy than their peers in any other country.



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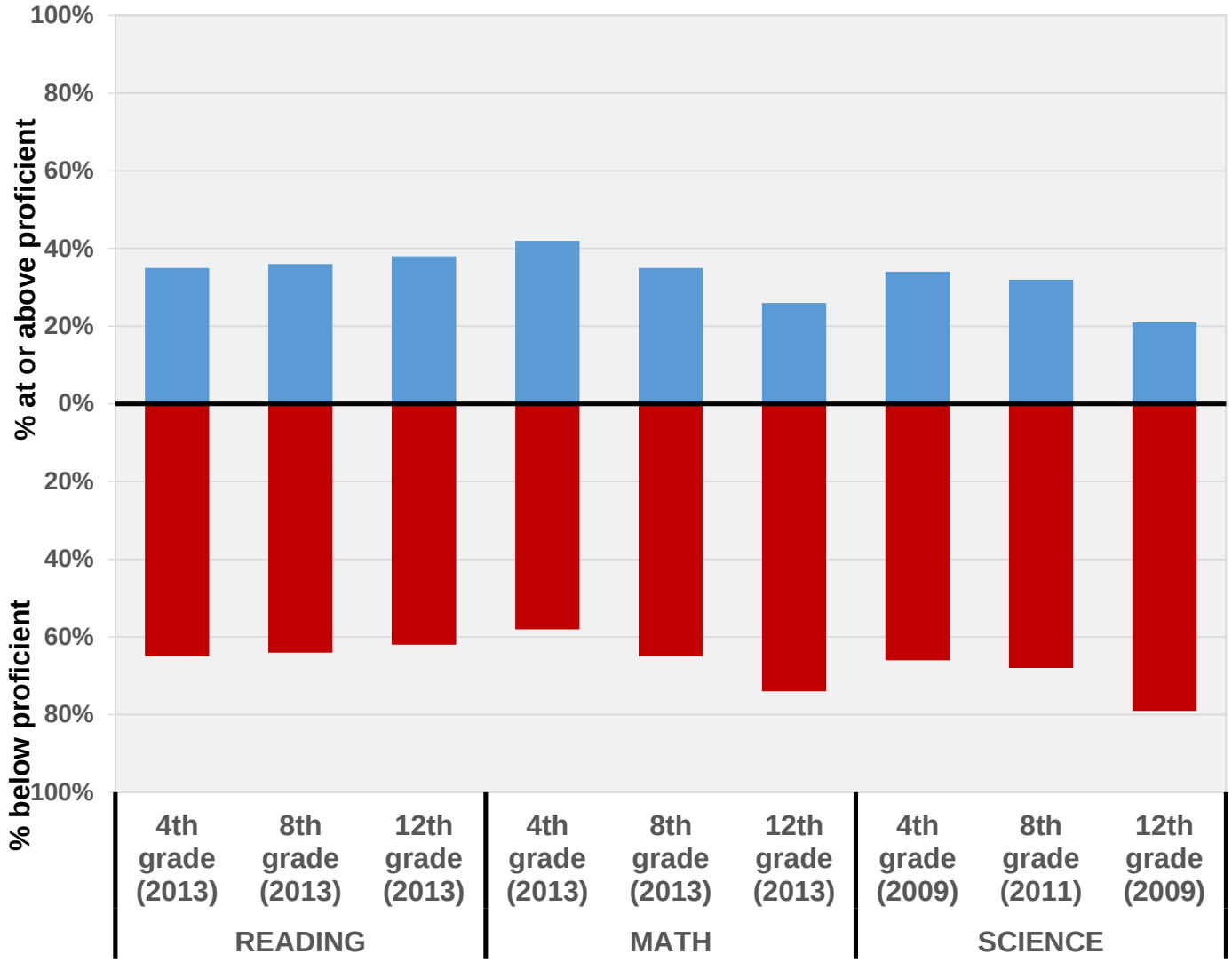
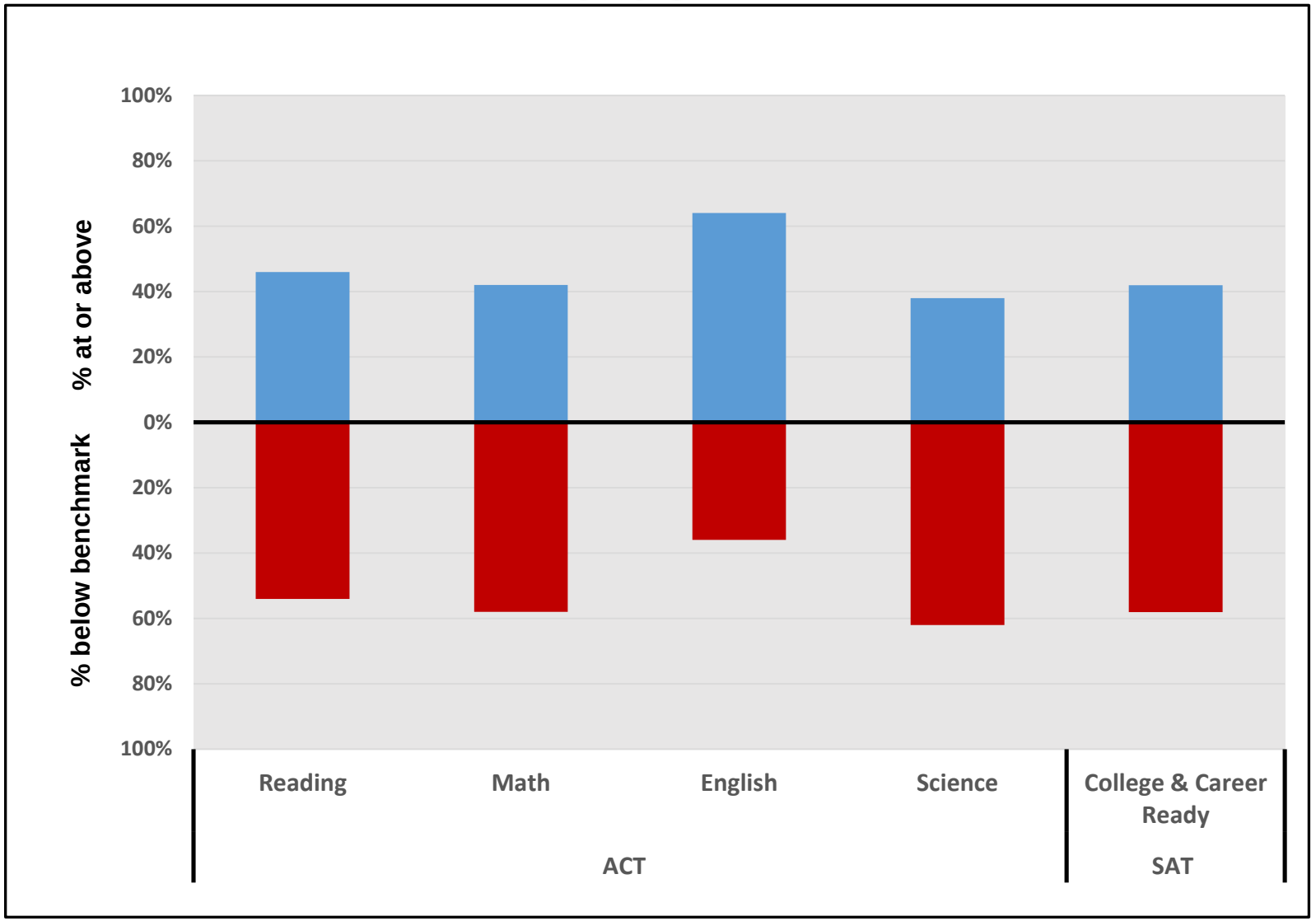
Percentage "at or above" and "below" proficient, NAEP Reading, Math & Science, 4th, 8th and 12th grade



Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), accessed from the NAEP Data Explorer, 9/3/15.

Percentage "at or above" and "below" established benchmarks, ACT and SAT



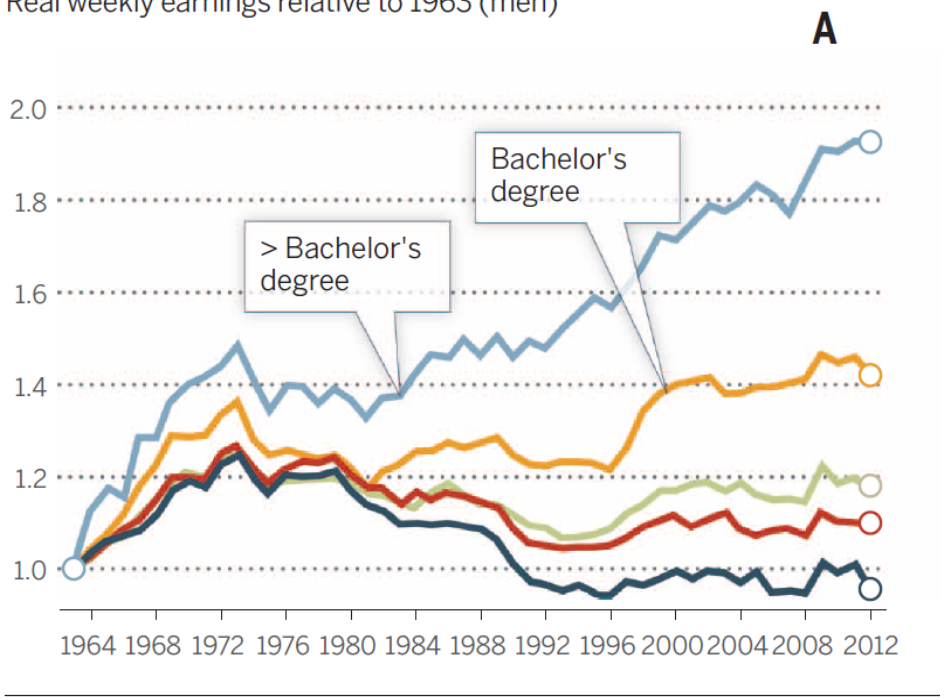
Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), accessed from the NAEP Data Explorer, 9/3/15.

Why These Results Matter

- Education and skills are more closely tied to earnings, employment and other non-economic outcomes
- In fact, over the past three decades, the annual and lifetime earnings gaps of U.S. workers (both men and women) by educational attainment have widened considerably, contributing to substantial inequalities in earnings, incomes, and wealth.

Changes in real wage levels of full-time U.S. workers by sex and education, 1963–2012

Real weekly earnings relative to 1963 (men)



Source: David H. Autor, Skills, education and the rise of earnings inequality among the "other 99 percent". Science, 23 May 2014, Volume 344, Issue 6186.

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- The growing inequality in family incomes has important consequences for the differential opportunities of children and their academic achievement.

Inequality and Opportunity

…Already the gradient between household income and college attendance has steepened substantially between cohorts born in the early 1960s and those born in the early 1980s. Since education is the key predictor of lifetime earnings, this suggests that the link between circumstances at birth and lifetime incomes will be magnified in the current generation relative to earlier ones.

- David Autor (MIT)

Percent of Young Adults (24-28) in the U.S. in 2008 with a Bachelor's Degree or Higher By Their ASVAB Score and Family Income Status in 1997

Family Income Status in 2007	ASVAB Test Score Quintile in 2007					
	Bottom	Second	Middle	Fourth	Top	All
Poor	1.2	6.5	7.3	22.3	51.1	7.1
1-2* Poor	1.5	9.0	10.8	21.7	50.3	14.1
2-3* Poor	2.2	8.9	20.0	37.0	48.2	22.7
3-4* Poor	4.5	9.5	26.8	42.0	64.5	34.7
4* Poor	6.3	21.1	38.1	51.9	72.5	48.1
ALL	2.7	11.2	23.8	38.6	63.8	27.1

Conclusions

Educated without skills

Enormity of the challenges we face …

- is not limited to a single group or locale
- also important is the fact that these challenges are being driven by forces that continue to gain strength with little evidence that they will pass by us on their own.

Where should we go from here?

ETS with the full support of the Board of Trustees has funded a project titled "Opportunity in America".

Questions and Discussion

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