Socio-economic status explains one-third of the racial disparity in top academic achievement

Excellence gaps — disparities in advanced academic achievement — between racial groups appear by age 8 or 9 and persist throughout secondary school in the United States. About one-third of the gap is due to socio-economic status and one-tenth to school factors, indicating that policies should address both educational and local environments.

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The problem

Social and wealth inequalities are intricately connected with educational disparities. Policymakers, schools and academics have long sought to address these differences. Historically, the United States has targeted achievement gaps (differences in students' average performance on standardized tests) through accountability measures, such as those mandated by the No Child Left Behind Act of 2001, to incentivize schools to boost mean achievement. Although addressing average differences is crucial, a narrow focus on the middle of the achievement spectrum can lead to other segments being neglected. Indeed, extensive analyses show that these past policies skewed learning gains away from the lowest-and highest-performing students[1].

A deeper understanding of excellence gaps — disparities in top academic achievement — is crucial to ensure that students have equal opportunities to attain future high-level and decision-making roles. Excellence gaps associated with student traits such as race and socio-economic status are widening, but have received considerably less attention from policymakers and academics than have gaps in average achievement[2]. Therefore, many questions remain about the historical impact of policies on these inequalities and the optimal design of future policies to address them effectively.

The solution

Using comprehensive, longitudinal, student-level administrative data from Michigan, we document key patterns and dynamics of the racial excellence gap. Our study begins with third-grade students (typically aged 8–9 years), tracking their academic trajectories until the end of secondary school (around age 18 years). We used scores on annual state-standardized tests as our main measure of academic achievement. Consistent with previous research on the excellence gap[3], we define academic excellence as achieving test scores in the top 10%.

Our comprehensive data set enabled us to gain insights into the prevalence, evolution and potential drivers of excellence gaps over the school years. We find that excellence gaps in mathematics and reading are already evident in third-grade students (Fig. 1a). White and Asian students were three times more likely than were students from minority racial groups (Black, Hispanic and others) to achieve top-decile test scores. This gap, particularly in maths, expands as students progress and persists into secondary school, as reflected by various university-readiness indicators, such as high scores in standardized tests (SATs).

We find that race is correlated with differences in student environments, such as family socio-economic status and the attended school. We therefore quantified the relative contributions of these factors to the racial disparities in academic excellence throughout the students' education. We found that around one-third of excellence gaps in maths and reading can be attributed to differences in socio-economic status, and about one-tenth to disparities in schools attended (Fig. 1b). These factors explain substantial portions of the racial disparities in students' achievement of academic excellence throughout their education.

Finally, to evaluate the impact of policies on excellence gaps, we examined the effect of accountability measures in Michigan that mandated district-level changes to schools that showed substantial achievement differences (based on characteristics other than race). Previous research indicates that these policies lead to temporary reductions in school-level achievement gaps[4]. We found that these policies failed to enhance academic excellence or reduce racial disparities in top achievement.

Future directions

Our findings indicate that schools, particularly during the early years, present a key opportunity for interventions aimed at closing excellence gaps. However, they also reveal that simply equalizing access to high-quality education is insufficient. To truly close these gaps, it is also crucial to enhance students' local environments, including home and familial resources.

Questions remain concerning how policy can effectively address excellence gaps. Our data highlight the predictive power of socio-economic status and attended schools — features associated with various other factors, such as access to learning materials, neighbourhood resources and family stability. Identifying the most-effective factors to target, and investigating whether policies that lessen financial burdens on low-income families can reduce excellence gaps, are avenues for future work. Moreover, much of the excellence gap remains unexplained. Research should explore other potential contributors to the emergence and expansion of these disparities.

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EXPERT OPINION

"This paper adds to the literature on racial disparities in the United States and is a valuable complement to studies focusing on disparities between minority and non-minority students at the lower tail of the educational achievement distribution. Hence, the work has the potential to shift the discussion on racial and socio-economic education disparities towards recognizing and investigating differences along the entire performance distribution."

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FIGURE

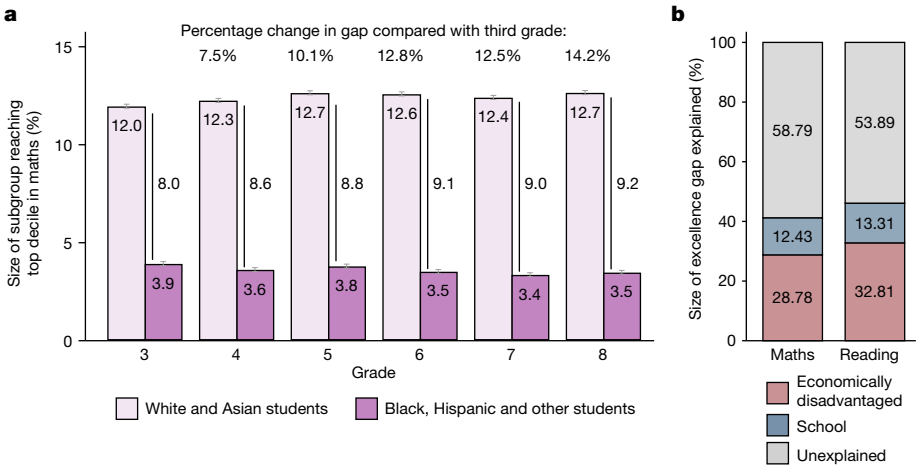


Figure 1 | Racial excellence gaps from the third to eighth grade. a, Disparities between white and Asian students and those from minority racial groups (Black, Hispanic and others) emerge by third grade (children aged 8 or 9 years) and persist across grades (analysed until eighth grade, students aged 13 or 14 years). **b**, These gaps are explained in part by differences in the students' socio-economic status and the attended school.

BEHIND THE PAPER

Our research journey began with an enquiry from a policymaker eager to support disadvantaged young people who demonstrate exceptional academic promise. Intrigued by this goal, we embarked on a quest to identify the most effective allocation of resources. To our surprise, we encountered numerous unanswered questions about the disparities in rates of top achievement. This revelation ignited our determination to acquire a comprehensive data set that is robust enough to explore the intricate nuances and student and school characteristics that are associated with the excellence gap. **J.A.L.** and **H.U.**

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FROM THE EDITOR

There are several elements of this work that stand out: the comprehensive description of the racial composition of those students in the top decile of achievement, how this changes between the third and eighth grade and how it's been affected by various policies. The authors' findings can inform strategies to help students from under-represented groups attain academic excellence, thereby bringing us one crucial step closer to achieving equality.

Mary Elizabeth Sutherland, Deputy Editor, *Nature*