Income Inequality
and the
Decision to Drop Out of High School

Melissa S. Kearney and Phillip B. Levine

When inequality is high, does being at the bottom of the socioeconomic ladder push students to work harder to climb the rungs, or do some just give up hope?

Income inequality is higher in the United States than other developed nations.[1] Among 13 of the most highly developed countries, rates of social mobility (as reflected in high rates of intergenerational income persistence) in the United States are lower than all but the United Kingdom and Italy.[2] These measures may be related: more unequal countries tend to have lower rates of social mobility.[3] Research from the United States confirms that this international pattern is also observed domestically across U.S. states.[4] A critical question is whether this relationship might reflect something causal. Might higher levels of income inequality actually lead to lower rates of social mobility, particularly lower rates of upward mobility for individuals from low-income families? If so, through what mechanisms?

Income Inequality: Motivator or Demotivator?
One way in which higher rates of income inequality might lead to lower rates of upward mobility is through lower rates of educational completion among children from low-income families. We

posit that economically disadvantaged adolescents, when faced with greater levels of income inequality, perceive their individual return to investment in education to be low—either through a correct assessment of actual returns or through a (mistaken) perception of those returns. A greater gap between the bottom and the middle of the income distribution may lead to such a heightened sense of economic marginalization that an adolescent at the bottom may not see much value in staying in school. We call this "economic despair."
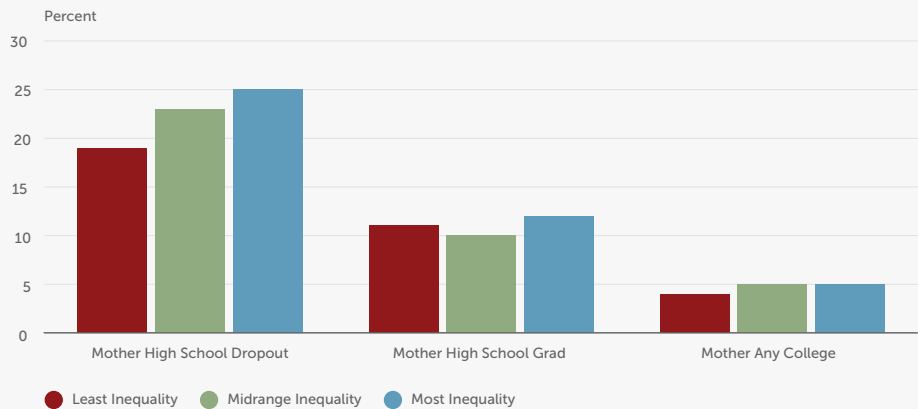
Standard economics models of human capital investment hold that income inequality gives people incentive to invest in their own education and to work harder than they otherwise might, in an attempt to climb to the upper rungs of the income distribution.[5] If this standard view is correct, we would expect to see greater rates of high school completion in more unequal places, all else equal. But, simple cross-sectional comparisons reveal the reverse correlation: states with higher levels of income inequality have higher rates of high school noncompletion. The graph "Relationship Between Inequality and High School Noncompletion in the United States" uses a measure of income inequality (the gap between the 50th percentile and the 10th percentile of household income distribution) to reflect the gap between the bottom and the middle. This cross-sectional relationship is consistent with our hypothesis regarding economic despair. Of course, this graph does not hold all else equal, so we conducted rigorous econometric analyses to explore this relationship further.

Relationship Between Inequality and High School Noncompletion in the United States

Percentage of high school freshman who do not graduate in four years (2011–12)
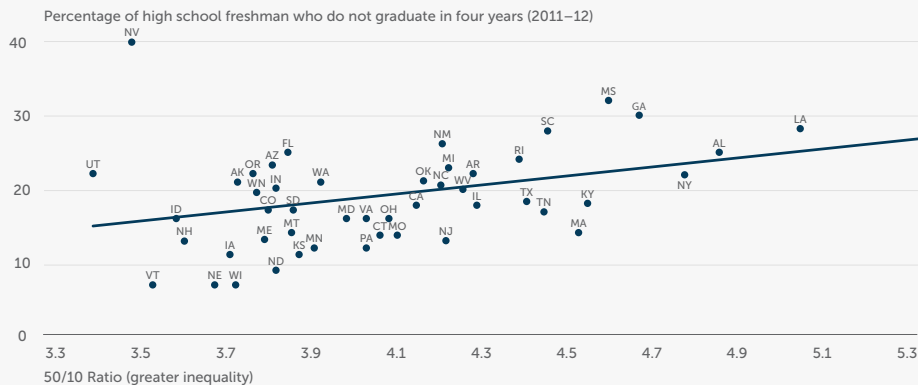
Note: The x axis is calculated by the authors and reflects the ratio between the 50th and 10th percentiles of the income distribution.
Source: The graduation data are from Marie C. Stetser and Robert Stillwell, "Public High School Four-Year, On-Time Graduation Rates and Event Dropout Rates: School Years 2010–11 and 2011–12" (National Center for Education Statistics Report No. 2014-391, Washington, DC, 2014). The District of Columbia is omitted from this figure because it is an extreme outlier on the x axis (50/10 ratio = 5.66).

High School Dropout Rate for Boys by Mother's Level of Education and State Level of Income Inequality

Percent

● Least Inequality   ● Midrange Inequality   ● Most Inequality

Source: Authors' calculations.

people live in, the institutions they interact with, and the perceptions children develop about their world and their opportunities are likely formed by the semipermanent conditions of the state, not transitory fluctuations in inequality.

Gender Differences

The data are consistent with the hypothesis that greater income gaps lead children from low-SES homes to drop out of school more often. The unadjusted data for boys show that low-SES boys in high-inequality states are almost six percentage points more likely to drop out of high school than are low-SES boys in low-inequality states—25 percent versus 19 percent. (See "High School Dropout Rate for Boys by Mother's Level of Education and State Level of Income Inequality.") Importantly, boys from high-SES families are no more likely to drop out of school if they live in a more unequal state; their dropout rate is consistently around 5 percent. This helps establish a negative causal effect of income inequality—at least on low-SES boys.

There is no corresponding difference observed among girls. Assuming our hypothesis is correct, this gender difference raises questions about how and why boys appear to be particularly sensitive to the economic environment around them.

We used nationally representative survey data collected on nearly 50,000 individuals to investigate whether children from low-socioeconomic-status (SES) homes—as captured by the educational attainment of the mother in the household[6]—are more likely to drop out of high school if they live in a more unequal state or metropolitan area, accounting for individual-level characteristics (including race and whether there are two parents in the home) and state- or metro-area-level characteristics (including controls for the policy environment and economic conditions).

Our measure of income inequality is the 50/10 income ratio mentioned earlier, calculated using U.S. census data on household income. We focused on this measure because the distance between the low end and the middle of the income distribution seems more relevant to disadvantaged youth than the distance to the top of the distribution. Our analyses focused on (relatively) fixed differences across states, not variation over time, because the neighborhoods

We built on this analysis by estimating a series of regression models that also control for other features of the state environment's interaction with low-SES status, along with lower-tail income inequality, to see whether they are really responsible for the relationship between inequality and high school noncompletion among low-SES boys. These other features included the absolute level of income at the bottom of the income distribution, the industrial composition of the labor market, and the demographic characteristics of the state. In every specification, the data clearly showed that the gap between the bottom and the middle of the income distribution is associated with lower rates of high school completion among low-SES boys, and the magnitude of that estimated effect is remarkably consistent across specifications.

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For Comparison: A Look at Prospective Wages

High school graduates earn more than high school dropouts: this knowledge may spur young people to stay in school. To test for this, we also estimated an additional model that includes a measure of the wage differential between high school graduates and dropouts. When we controlled for this factor, we still found a positive association between the 50/10 ratio and high school dropout rates. The data do show, however, that inequality in the form of wage returns corresponds with lower rates of high school dropout.[7] It is striking that the data clearly indicate offsetting effects: wage inequality is associated with greater educational completion, but overall household-level income inequality is associated with a negative effect on educational attainment—for low-income boys.

Possible Mechanisms for Income Inequality's Effect

If income inequality affects school completion rates, how does it do so? One possibility is that income inequality exercises its effect through higher rates of residential segregation (by either race or income). It could also be influencing dropout rates through its effect on public-school financing—if taxpayers in more unequal locations provide less funding to schools populated by low-income families, for instance. But the data do not offer support for these proposed mechanisms.[8] It is also possible that low-SES youth in more unequal places are simply of lower ability, for whatever reason. To investigate this possibility, we incorporated the scores of low-SES students on the Armed Forces Qualification Test, as a proxy for ability. Doing so reduced the estimate of the impact of inequality on high school dropout rates by one-third, but nevertheless, the estimated impact remained substantial. Overall, all these approaches support the notion that higher rates of income inequality lead low-SES boys to drop out of school at higher rates.

Avenues of Future Research

Our paper provides robust evidence of a link between higher levels of aggregate lower-tail income inequality and lower rates of high school completion among boys from low-SES homes. Future research should investigate more deeply *why* this relationship holds. We speculate that the reasons may have to do with individual perceptions, consistent with our model of economic despair,[9] but we cannot directly test this model with the data available to us. Because the data do not offer support for any of the direct mechanisms we described earlier, our "residual" explanation about the role of per-

ceptions takes on greater credibility. We call on researchers across social-science disciplines to conduct additional investigations of this hypothesis. Meanwhile, our findings highlight the importance of policies that give low-SES youth reasons to believe they have opportunities to climb the economic ladder, along with policies that make those opportunities real.

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Endnotes

[1] Of nations in the Organisation of Economic Co-operation and Development (OECD), only Chile, Mexico, and Turkey have greater income inequality, as measured by the Gini Coefficient (a standard measure of national income inequality). See the OECD Income Distribution Database, http://www.oecd.org/social/income-distribution-database.htm.

[2] See, for example, Miles Corak, "Income Inequality, Equality of Opportunity, and Intergenerational Mobility," *Journal of Economic Perspectives* 27, no. 3 (Summer 2013): 79–102.

[3] Miles Corak, "Do Poor Children Become Poor Adults? Lessons from a Cross-Country Comparison of Generational Earnings Mobility," *Research on Economic Inequality* 13 no. 1 (March 2006): 143–88.

[4] Melissa S. Kearney and Phillip B. Levine, "Income Inequality, Social Mobility, and the Decision to Drop Out of High School" (Brookings Papers on Economic Activity, Brookings Institution, Washington, DC, 2016), http://www.brookings.edu/~/media/Projects/BPEA/Spring-2016/KearneyLevine_IncomeInequalityUpwardMobility_ConferenceDraft.pdf?la=en.

[5] Gary Solon formalizes this concept in a model in which parents make human capital investments in their children. Building on the theoretical foundation of Gary Becker and Nigel Tomes's 1979 "An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility," (*Journal of Political Economy* 87 no. 6: 1153–89), he shows that parental investment in a child's human capital increases when the payoff from that return is higher—that is, when there is more wage inequality. Gary Solon, "A Model of Intergenerational Mobility Variation over Time and Place," in *Generational Income Mobility in North America and Europe*, ed. Miles Corak (Cambridge: Cambridge University Press, 2004).

[6] The best measure of family resources would be expected lifetime income, but that is not available. Maternal education is a good proxy for that measure because it reflects the strong relationship between education and income and overlooks year-to-year random fluctuations.

[7] In a technical sense, we obtained a positive and significant coefficient on the interaction between bottom-tail inequality and low SES on the dropout rate for boys, but a negative coefficient on the interaction between educational wage differentials and low SES in the same model.

[8] As in past analyses, we draw this conclusion by estimating regression models that also include these other factors interacting with low-SES status. We find that doing so has no substantive impact on our main finding.

[9] Melissa S. Kearney and Phillip B. Levine, "Income Inequality and Early Nonmarital Childbearing," *Journal of Human Resources* 49, no. 1 (Winter 2014): 1–31.