

# **Income-Based Gaps in Parental Investments in Adolescence**

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## **Background**

Income-based college attainment gaps have grown in the United States over the last forty years (Bailey & Dynarski, 2011). This trend is alarming because it suggests that the increases over the past few decades in family income inequality will continue for the next generation.

College-attainment gaps have grown at the same time that income inequality has increased, but income inequality alone does not explain their growth. One complementary explanation is widening differences by income in parental investments in their adolescents' education and cognitive development.

The empirical evidence indicates there are growing differences between upper-income and college-educated parents, on the one hand, and lower-income and less-educated parents, on the other hand, in investments of time and money in their children. Studies of parental time use have found increases in time spent with children among the most highly-educated families since the 1990s (Ramey & Ramey, 2010). Moreover, educational "spending gaps" between high- and low-income families (defined as top- and bottom-income decile families) and more- and less-educated parents grew between 1972 and 2010 (Kornrich, 2016; Kornrich & Furstenberg, 2013).

One limitation of the above-mentioned studies, however, is that they do not examine parental engagement in activities and investments focused on fostering children's cognitive development and education. Two recent studies, by Bassok et al., (2016) and Kalil et al., (2016), examined income-based parental investment gaps with young children over time. The findings from Kalil and colleagues' study generally support the hypothesis that upper-income families are investing more relative to lower-income families in their children's educational and cognitive development, while the findings from Bassok and colleagues do not. The inconsistent findings and limited focus on young children suggest a need for additional work. To date, no studies have examined parental investment gaps over time for adolescents.

## **Research Questions:**

Therefore, this study aims to answer two questions:

1. What are the trends by family income in parental investments in the educational development of their adolescents?
2. Have income-based parental investment gaps grown over time?

## **Setting**

The data used in this study come from two National Center of Education Statistics (NCES) surveys of high school students: the National Education Longitudinal Study of 1988 (NELS:88, high school class of 1992) and the Education Longitudinal Study of 2002 (ELS:2002, high school class of 2004). Both studies employed a multi-stage probability sample design to select primary sampling units (schools) and then to select adolescents from within the selected schools.

## Outcomes and Data

My outcomes are five measures of parental investments as reported by students and parents. The student-reported measures are whether the parent thinks attending college after high schools is the most important thing for teen to do, whether the teen has taken or plans to take college entrance exam preparation, whether the teen has discussed going to college with his/her parents, and whether the teen has discussed school courses with parents. The parent-reported measure is whether the parent has taken steps to financially prepare for their teen's education after high school.

The key predictor of interest is family income. Family income is parent reported and is measured in 15 categories in NELS:88 and 13 categories in ELS:02. Family income is operationalized as family income percentile rank in this study. Analyses compare the investments of parents at the 10th, 50th, and 90th percentile ranks of these distributions. In describing family income, this study refers to these ranks as low, median, and high income, respectively.

## Research Design

I estimate levels of parental involvement by family income percentile rank and income-based gaps in parental involvement based on a method developed by Reardon (2011) and used in studies of parental involvement during early childhood (e.g. Bassok et al., 2016; Kalil et al., 2016). Reardon's method allows one to estimate an income distribution from a set of ordered income categories. Specifically, it results in estimates of the percentile ranks corresponding to the income categories.

I then fit a cubic regression model of the following form:

$$Y = a + bQ^* + cQ^{2*} + dQ^{3*} + e, \quad (1)$$

where  $Y$  is the value of a given parental investment measure and  $Q^*$  indicates the percentile rank of the family income.

To answer my research questions, I make two types of comparisons. First, I estimate average levels of parental investments at the 10<sup>th</sup>, 50<sup>th</sup>, and 90<sup>th</sup> percentile ranks of the family income distribution and test differences in levels between cohorts. These estimates and associated standard errors are generated from the fitted parameters of Equation (1). Second, I formally test whether income-percentile-based parental investment gaps changed between cohorts. I do this by computing gaps in parental investments (90/10, 90/50, and 50/10) and associated standard errors for each cohort. For example, the 90/10 gap is calculated as follows:

$$\begin{aligned} \hat{\delta}_{10}^{90} &= [\hat{Y}|Q = .9] - [\hat{Y}|Q = .1] \\ &= [\hat{a} + \hat{b}(.9) + \hat{c}(.81) + \hat{d}(.729)] - [\hat{a} + \hat{b}(.1) + \hat{c}(.01) + \hat{d}(.001)] \\ &= .8\hat{b} + .8\hat{c} + .728\hat{d}. \end{aligned} \quad (2)$$

All analyses account for the complex designs of the surveys.

## Results and Conclusion

Between the NELS and ELS cohorts (classes of 1992 and 2004), I find rising levels of parental investment, particularly among low-income families (Table 1). Low-income adolescents in the high school class of 2004 are more likely to state that their parents think attending college after

high school is the most important thing than in the 1992 cohort. I also find increases across income groups in the proportion of adolescents discussing schools courses with their parents and the proportion of adolescents taking art, music, and dance lessons.

Income-based parental investment gaps are stable across the two cohorts, with two exceptions (Table 2). The 90/10 gap in parental desire for the teen to attend college decreased by 16 percentage points between the two cohorts. The 90/50 and 50/10 gaps also decreased. The 90/10 gap in parents discussing school courses declined by 5 percentage points.

My results do not indicate widening differences over time between high- and low-income families in parental investments in their adolescents' education and cognitive development. Therefore, it is unlikely that the quantity of these investments explain widening college attainment gaps. One possibility, not explored in this study, is that qualitative, rather than quantitative, differences in parental investments may be driving income-based gaps in college attainment.

## References

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## Tables

Table 1

*Student- and Parent-Reported Parental Investments at the 10th, 50th, and 90th Percentile Ranks of Income.*

Measure	NELS	ELS	Change	NELS	ELS	Change	NELS	ELS	Change
	8th, 10th & 12th grade	10th & 12th grade		8th, 10th & 12th grade	10th & 12th grade		8th, 10th & 12th grade	10th & 12th grade	
	10th Percentile			50th Percentile			90th Percentile		
Parents want teen to attend college after high school (10th)	0.602	0.770	0.169***	0.747	0.799	0.051***	0.871	0.875	0.005
Teen has taken or plans to take SAT or ACT preparation (12th)	0.555	0.567	0.012	0.562	0.561	0.001	0.671	0.715	0.044*
Teen discussed going to college with parents (10th)	0.796	0.837	0.041*	0.867	0.873	0.0056	0.935	0.928	-0.007
Teen discussed school courses with parents (12th)	0.640	0.724	0.084***	0.734	0.778	0.045***	0.819	0.868	0.049***
Teen takes art, music, dance lessons (12th)	0.123	0.197	0.074***	0.143	0.214	0.072***	0.187	0.287	0.100***
Parent has taken steps to financially prepare for teen's education after high school (8th, 10th)	0.259	0.306	0.047**	0.485	0.477	-0.008	0.732	0.773	0.041**

*Note.* Sample sizes, rounded to the nearest to 10 due to the reporting rules of the National Center for Education Statistics, were 14,450 and 16,450 in the analytic samples of NELS and ELS, respectively. The estimates of NELS were adjusted with the F1F2 panel weight and the estimates of ELS were adjusted with the F1 panel weight; NELS=National Educational Longitudinal Survey; ELS=Educational Longitudinal Survey; HSLs=High School Longitudinal Survey.

\* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$ .

Table 2

*Income gaps in Parental Investments.*

	90/10 Gap			50/10 Gap			90/50 Gap		
	NELS 8th, 10th & 12th grade	ELS 10th & 12th grade	Change	NELS 8th, 10th & 12th grade	ELS 10th & 12th grade	Change	NELS 8th, 10th & 12th grade	ELS 10th & 12th grade	Change
Parents want teen to attend college after high school (10th)	0.269	0.105	-0.164***	0.146	0.028	-0.117***	0.123	0.077	-0.047**
Teen has taken or plans to take SAT or ACT preparation (12th)	0.116	0.148	0.032	0.007	-0.006	-0.013	0.109	0.154	0.044*
Teen discussed going to college with parents (10th)	0.139	0.091	-0.048**	0.071	0.036	-0.036	0.067	0.055	-0.012
Teen discussed school courses with parents (12th)	0.178	0.144	-0.035	0.093	0.054	-0.039	0.085	0.089	0.004
Parent has taken steps to financially prepare for teen's education after high school (8th, 10th)	0.473	0.467	-0.006	0.226	0.171	-0.055**	0.247	0.296	0.049*

*Note.* Sample sizes, rounded to the nearest 10 due to the reporting rules of the National Center for Education Statistics, were 14,450 and 16,450 in the analytic samples of NELS and ELS, respectively. The estimates of NELS were adjusted with the F1 F2 panel weight and the estimates of ELS were adjusted with the F1 panel weight; NELS=National Educational Longitudinal Survey; ELS=Educational Longitudinal Survey; HSLs=High School Longitudinal Survey.

\* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$ .