

the widening academic achievement
gap between the rich and the poor:
new evidence and possible
explanations

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social reproduction

- on average, students from families of higher socioeconomic status perform better on academic tests, attain higher levels of schooling, and (as a consequence) attain higher socioeconomic status themselves as adults
- however, the extent of social reproduction – the strength of the correlation between parental socioeconomic status and children's outcomes – is mutable; it may vary across time and place, as a result of social policy, norms, values, and economic conditions.

key questions



- how large is the socioeconomic achievement gap in the US?
 - ▣ specifically, how large is the *income* achievement gap?
 - ▣ how does it compare to other countries?
- how has this gap changed over the last 50 years?
- what accounts for the evident changes?

data

- all available US studies meeting three criteria:
 - ▣ nationally-representative sample
 - ▣ standardized achievement test
 - ▣ information on family income
- 13 studies included
 - ▣ **Project TALENT, NLS72, HS&B, NLSY79, NELS, Add Health, Prospects, NLSY97, ELS, SECCYD, ECLS-K, HSLS, ECLS-B.**
- these include student cohorts born 1943-2001 and tested 1960-2009

measuring achievement gaps

- Measuring gap between high- and low-income students is complicated...
 - ▣ ...because income is continuous, not a binary variable
 - ▣ ...because income distribution changes over time
 - ▣ ...because income is reported in categories
 - ▣ ...because income is reported with error
- Comparing gaps across studies is complicated...
 - ▣ ...because test content differs
 - ▣ ...because test scales differ
 - ▣ ...because test reliabilities differ
 - ▣ ...because samples differ (in age/grade, representativeness)

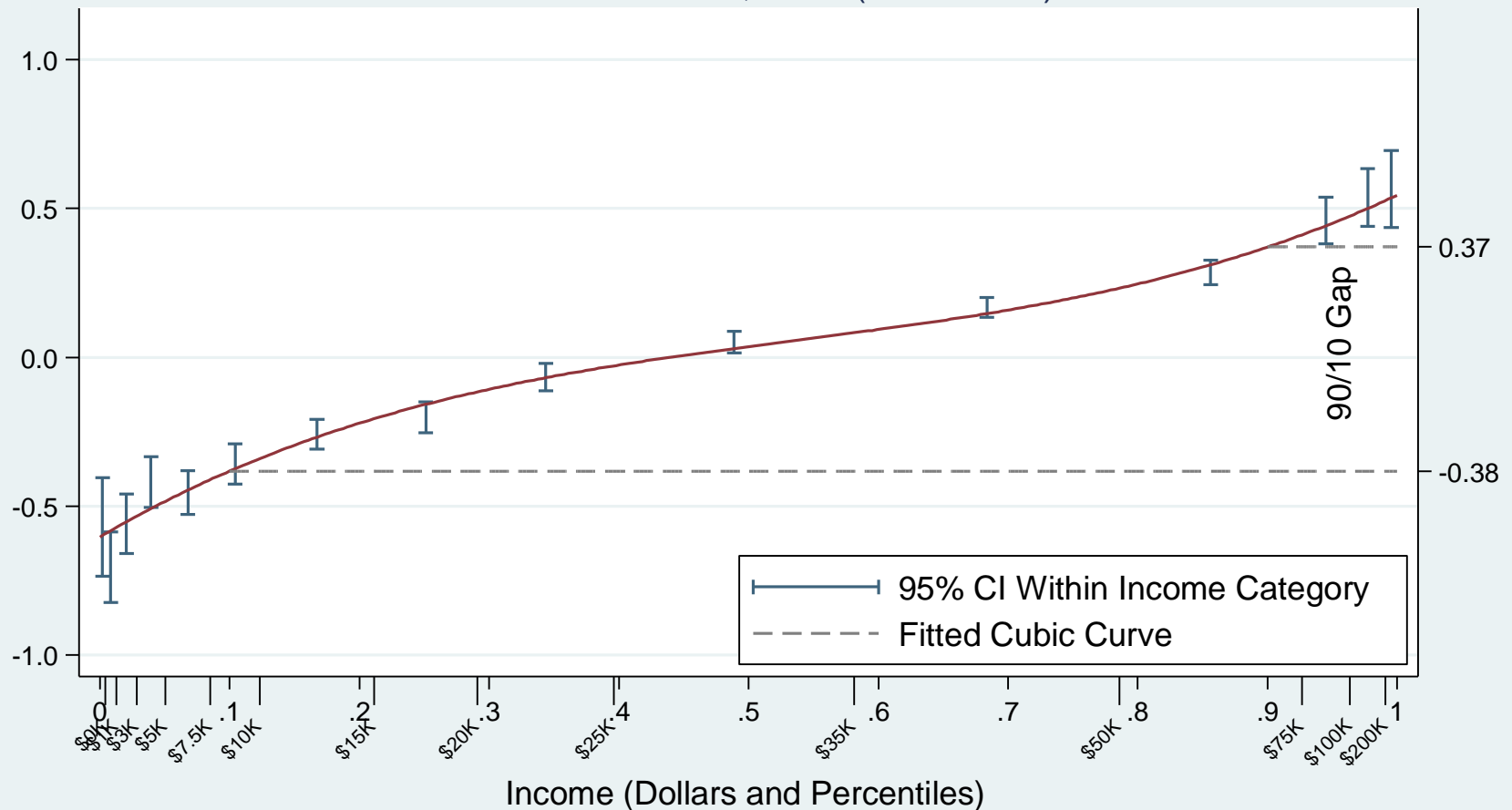
Computing income achievement gaps

□ Solution

- ▣ Standardize test scores within each study
- ▣ Use categorical income data to estimate average achievement of children in families at 90th and 10th percentiles of the income distribution
- ▣ Adjust for estimated reliability of income
- ▣ Adjust for estimated reliability of achievement test
- ▣ Use longitudinal studies to assess if/how gaps vary with age/grade
- ▣ Sensitivity analysis to assess sensitivity to different sampling designs
- ▣ Weight estimates by inverse of sampling variance

computing income achievement gaps

Association Between Reading Score and Family Income Percentile, Grade 8 Students, 1988 (NELS data)



Adjusting gaps for reliability

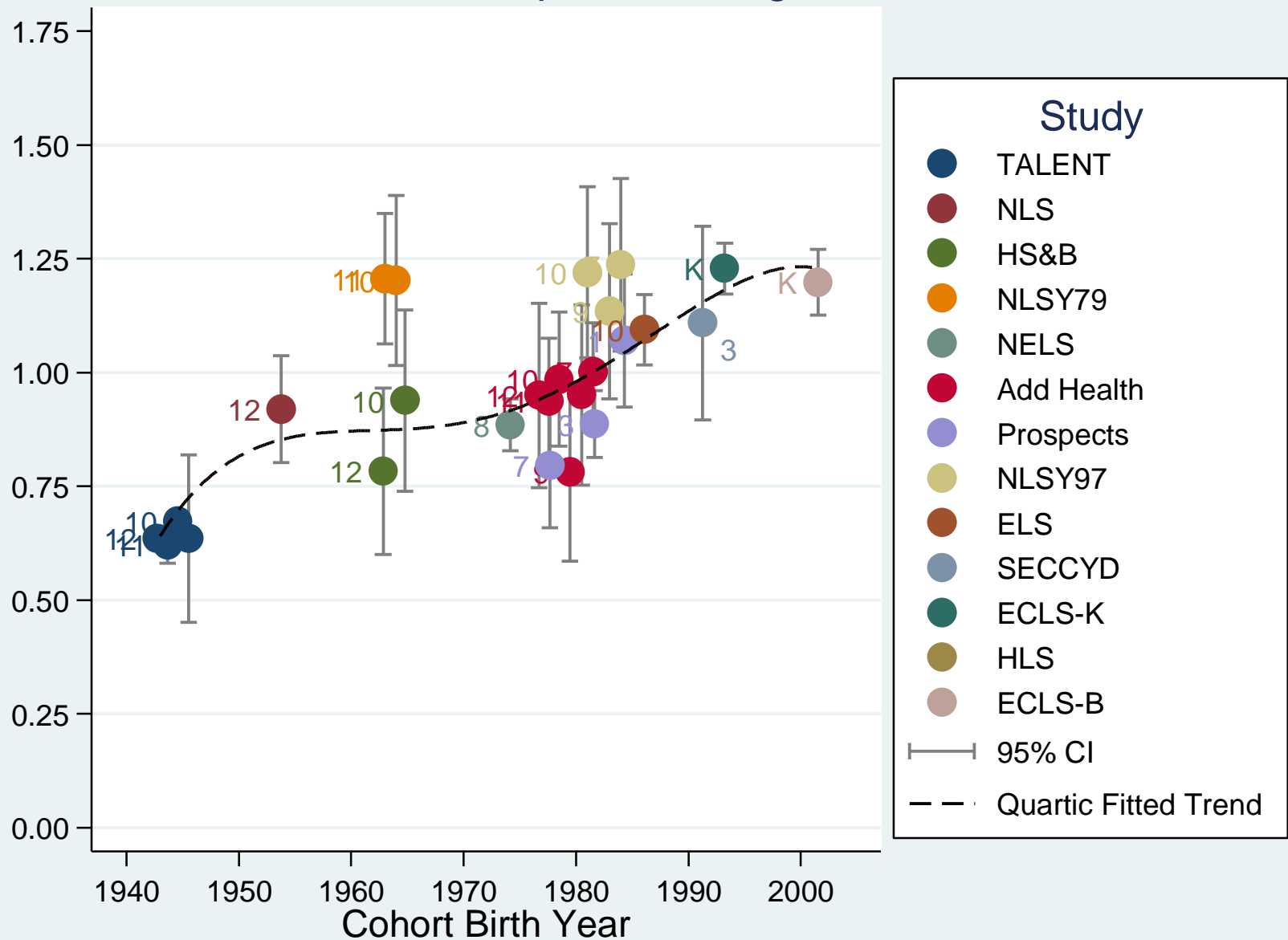
- Both income and academic achievement are measured with error
- Both will cause estimated gaps to be biased toward zero (attenuation bias)
- Obtain estimates of reliability of income (\hat{r}_{inc}) and reliability of achievement (\hat{r}_{ach}) for each test
- Disattenuated gap estimate is:

$$\hat{G}^* = \frac{\hat{G}}{\sqrt{(\hat{r}_{inc} \cdot \hat{r}_{ach})}}$$

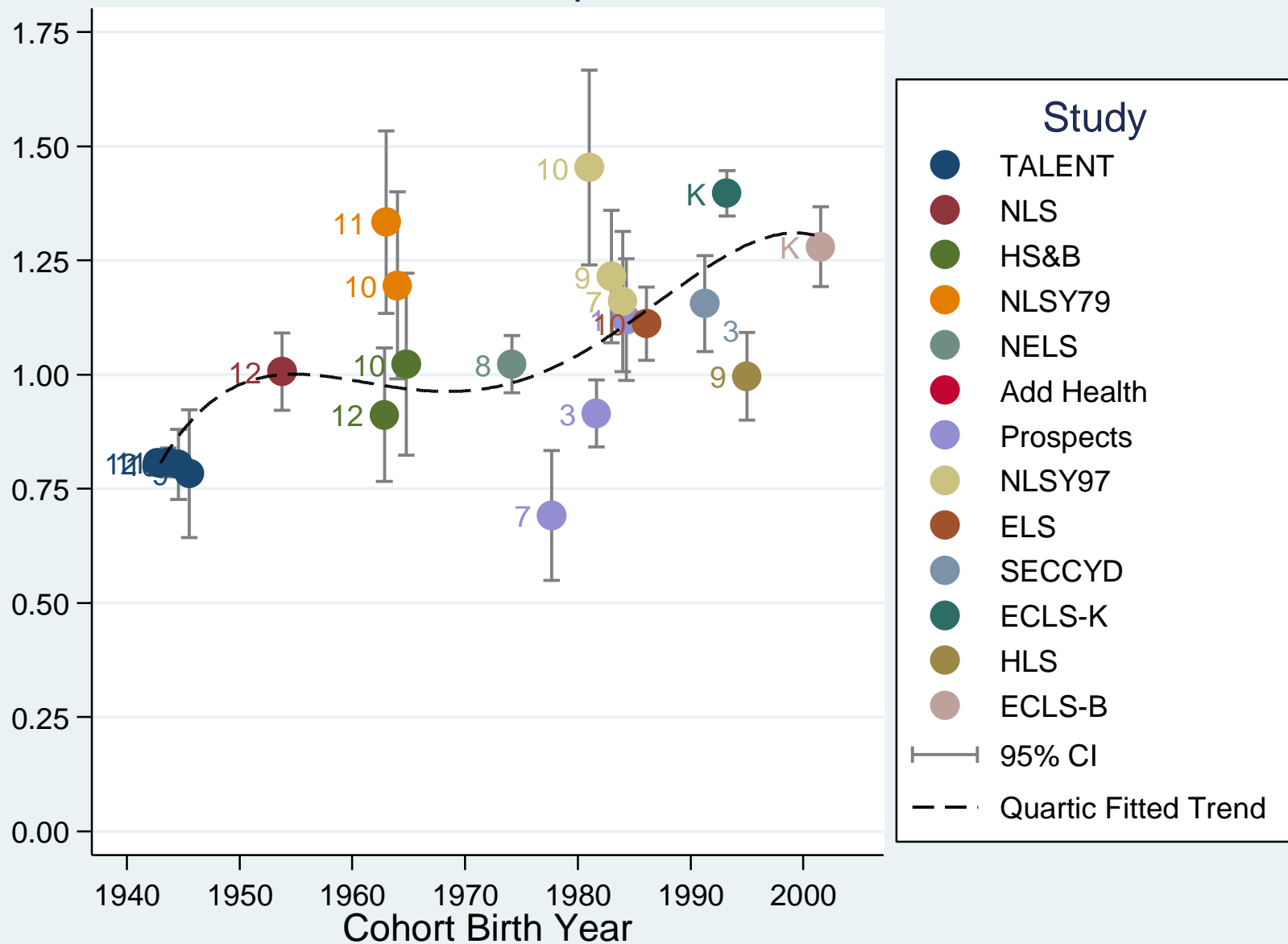
findings

- How has the achievement gap changed in the last 50 years?
 - ▣ ... between high-income (90th percentile) and low-income (10th percentile) children?
 - ▣ ... between high-income (90th percentile) and middle-income (50th percentile) children?
 - ▣ ... between middle-income (50th percentile) and low-income (10th percentile) children?

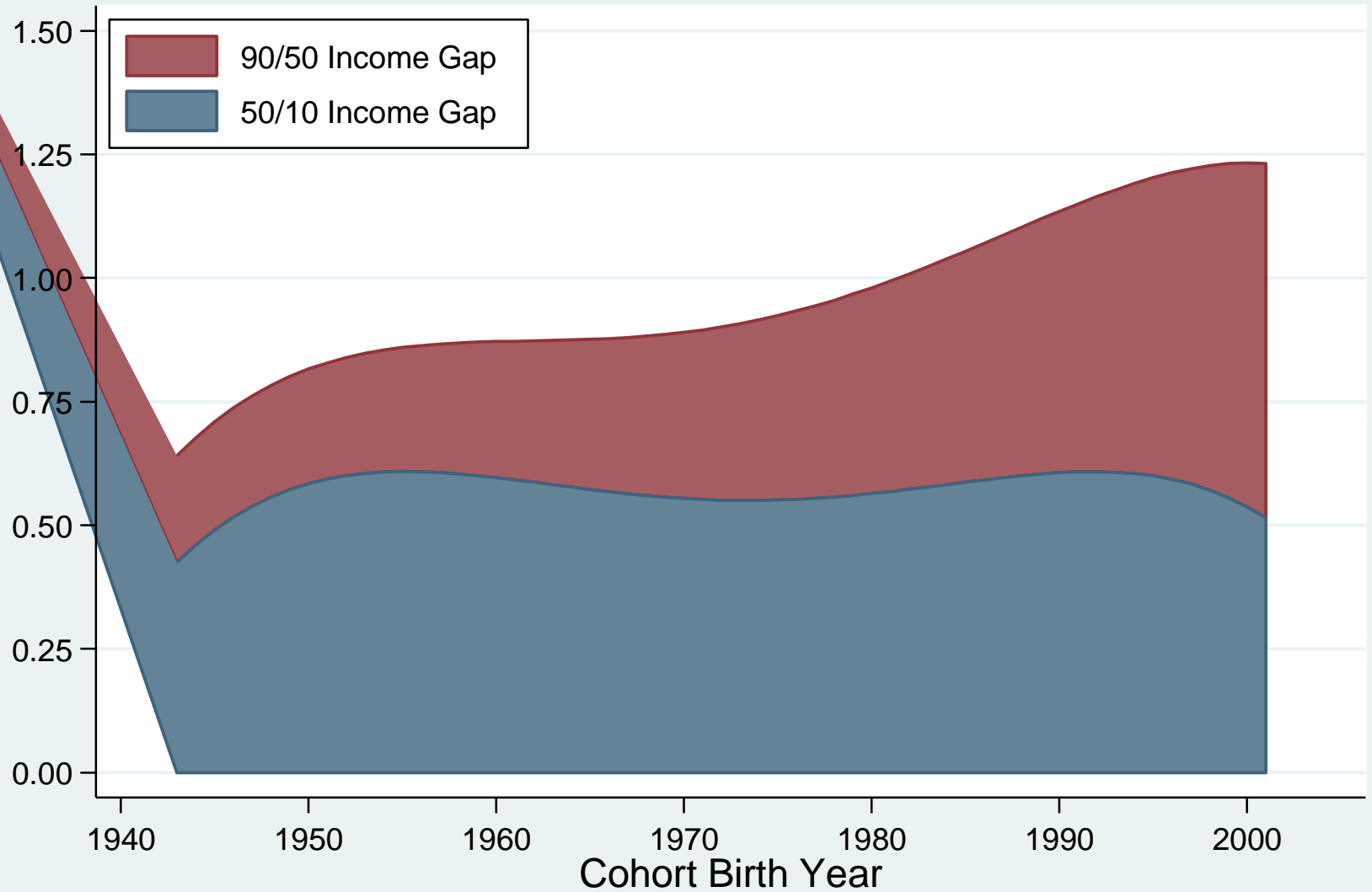
Trend in 90/10 Income Gap in Reading, 1940-2001 Cohorts



Trend in 90/10 Income Gap in Math, 1940-2001 Cohorts

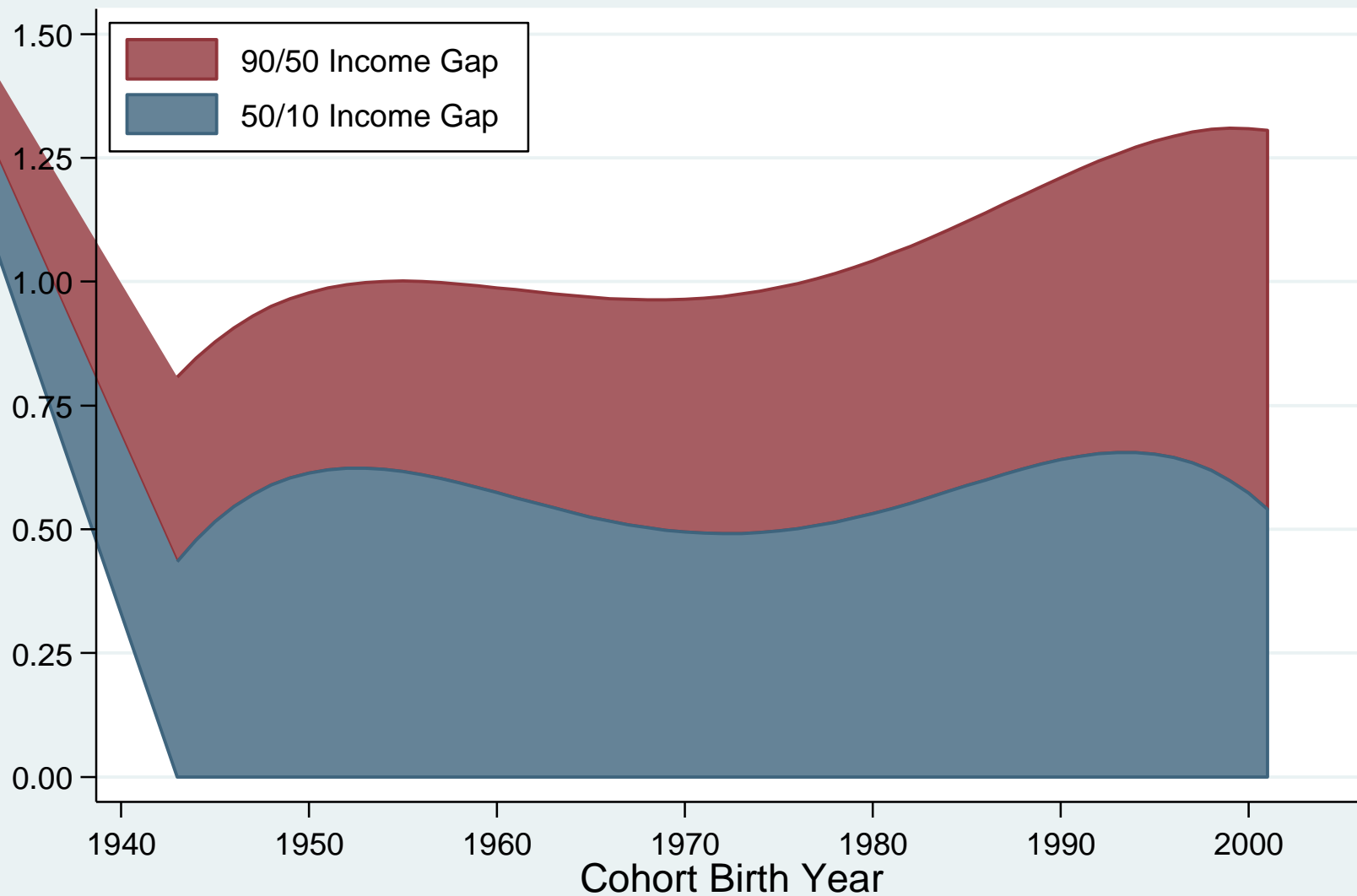


Income Achievement Gaps (90/50 and 50/10 Gaps) Reading, 1943-2001 Birth Cohorts



Source: Reardon (2011)

Income Achievement Gaps (90/50 and 50/10 Gaps) Math, 1943-2001 Birth Cohorts



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how large are these gaps?

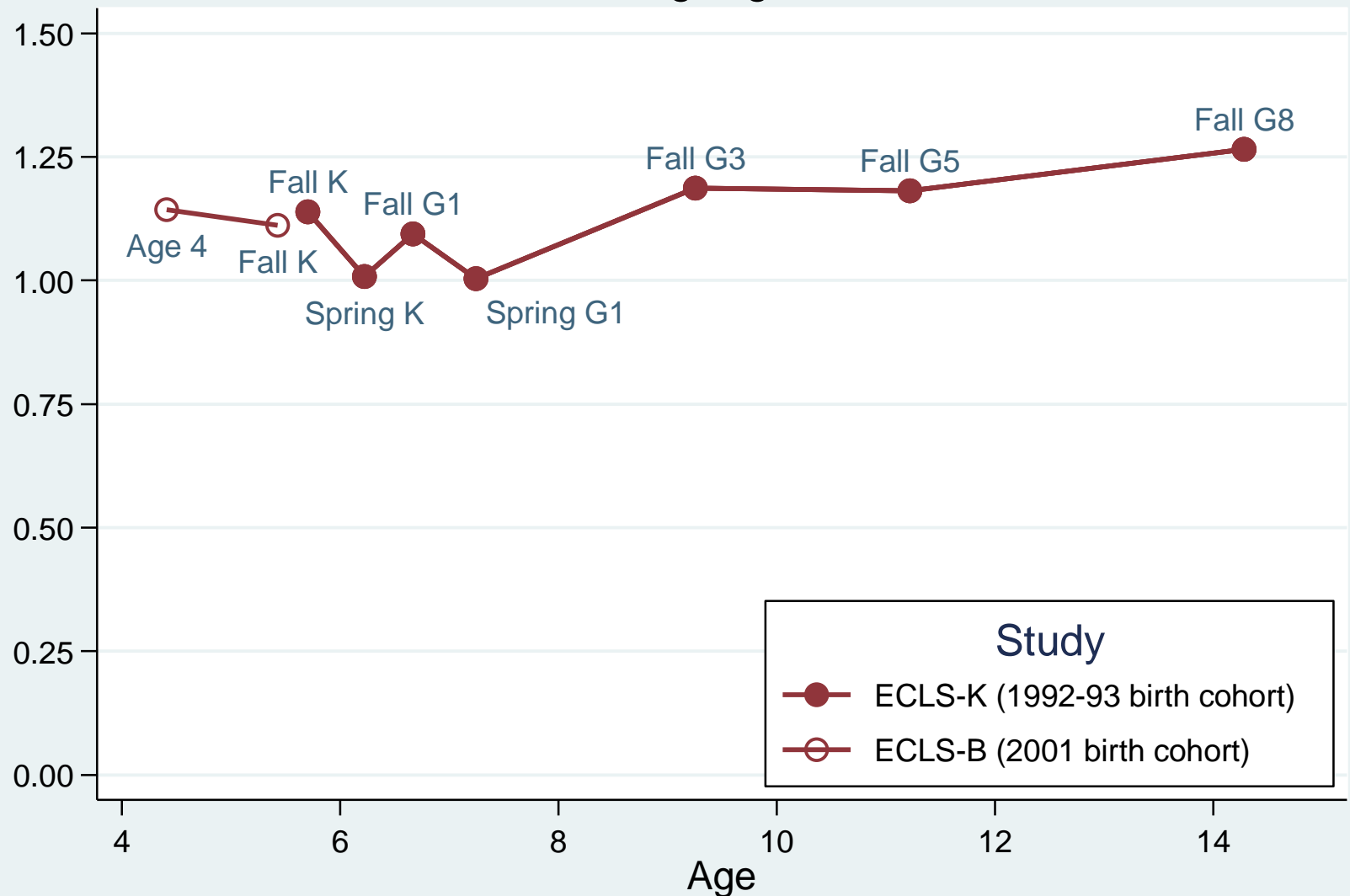
- one standard deviation is the difference between the 31st and 69th percentile
- if the gap is one standard deviation, this implies that the average student in a family at the 10th percentile of the income distribution has test scores lower than 84% of students in families at the 90th percentile of the income distribution
- one standard deviation is the amount a typical student learns in
 - ▣ a year in K-1
 - ▣ 3 years in elementary-middle school
 - ▣ 6 years in middle-high school

findings



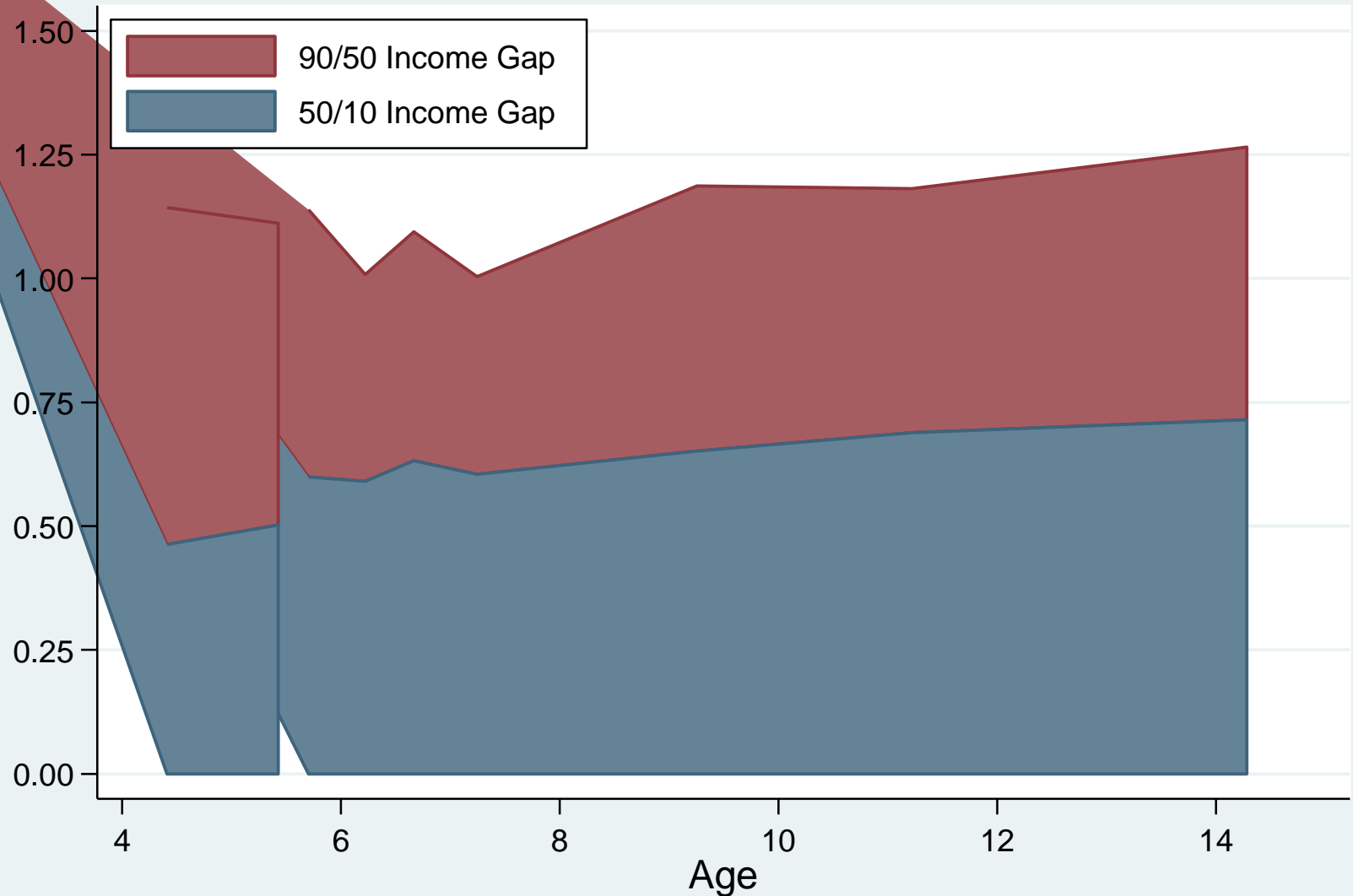
- How does the achievement gap change as children progress through school?

Development of Income Achievement Gap (90/10 Gap) Reading, Ages 4-15



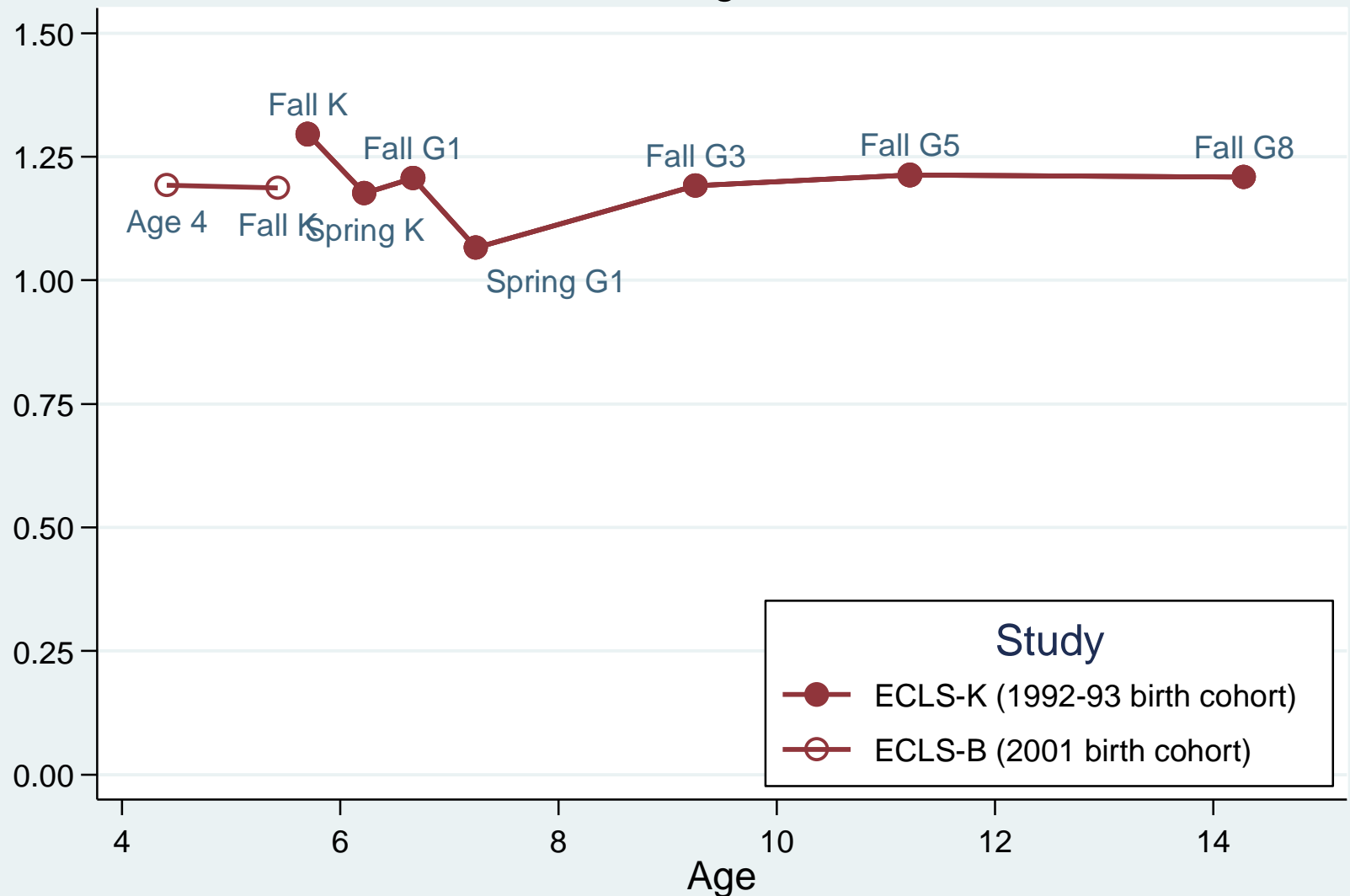
Source: Reardon (2011)

Income Achievement Gaps (90/50 and 50/10 Gaps) Reading, Ages 4-15



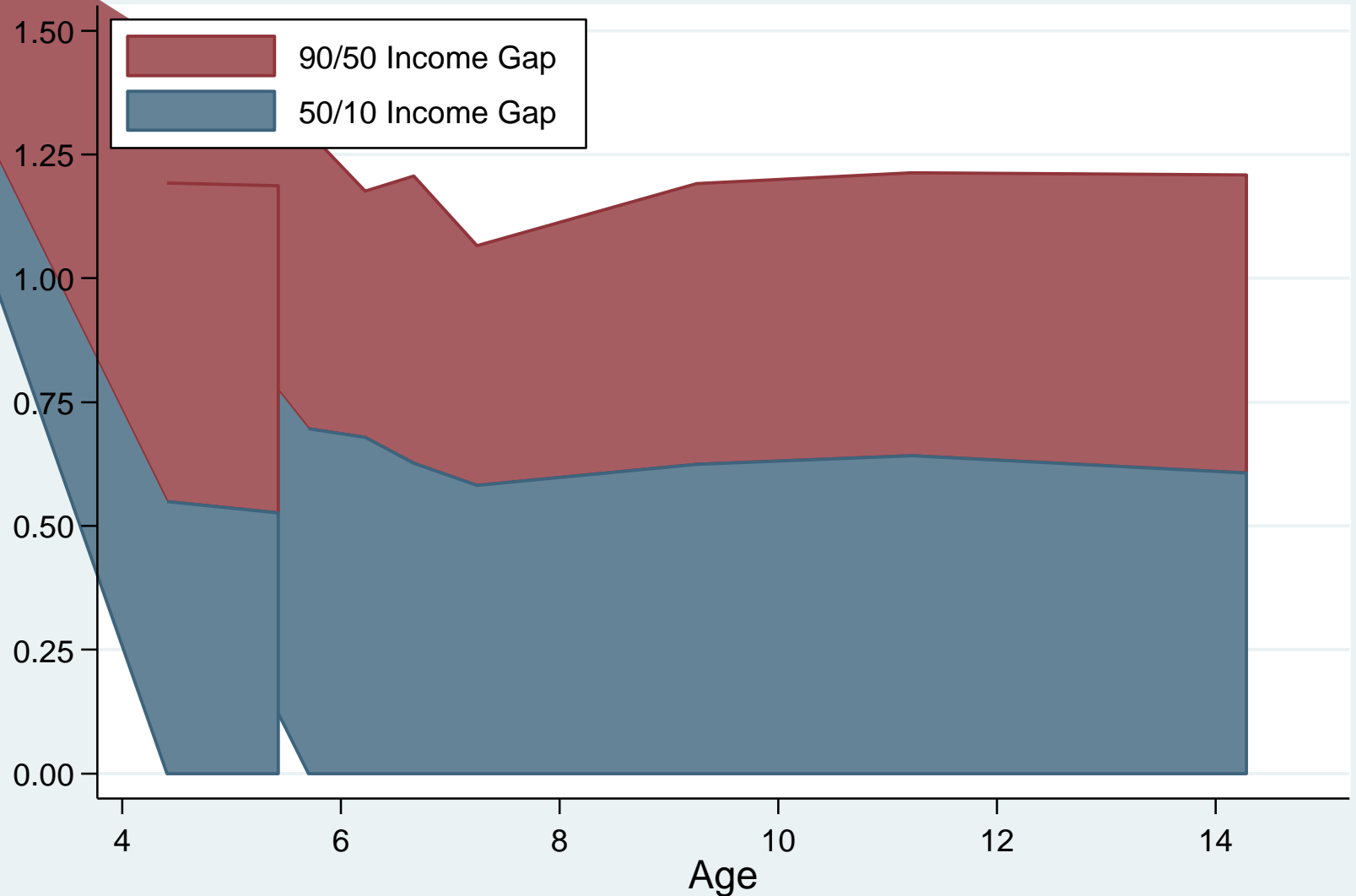
Source: Reardon (2011)

Development of Income Achievement Gap (90/10 Gap) Math, Ages 4-15



Source: Reardon (2011)

Income Achievement Gaps (90/50 and 50/10 Gaps) Math, Ages 4-15



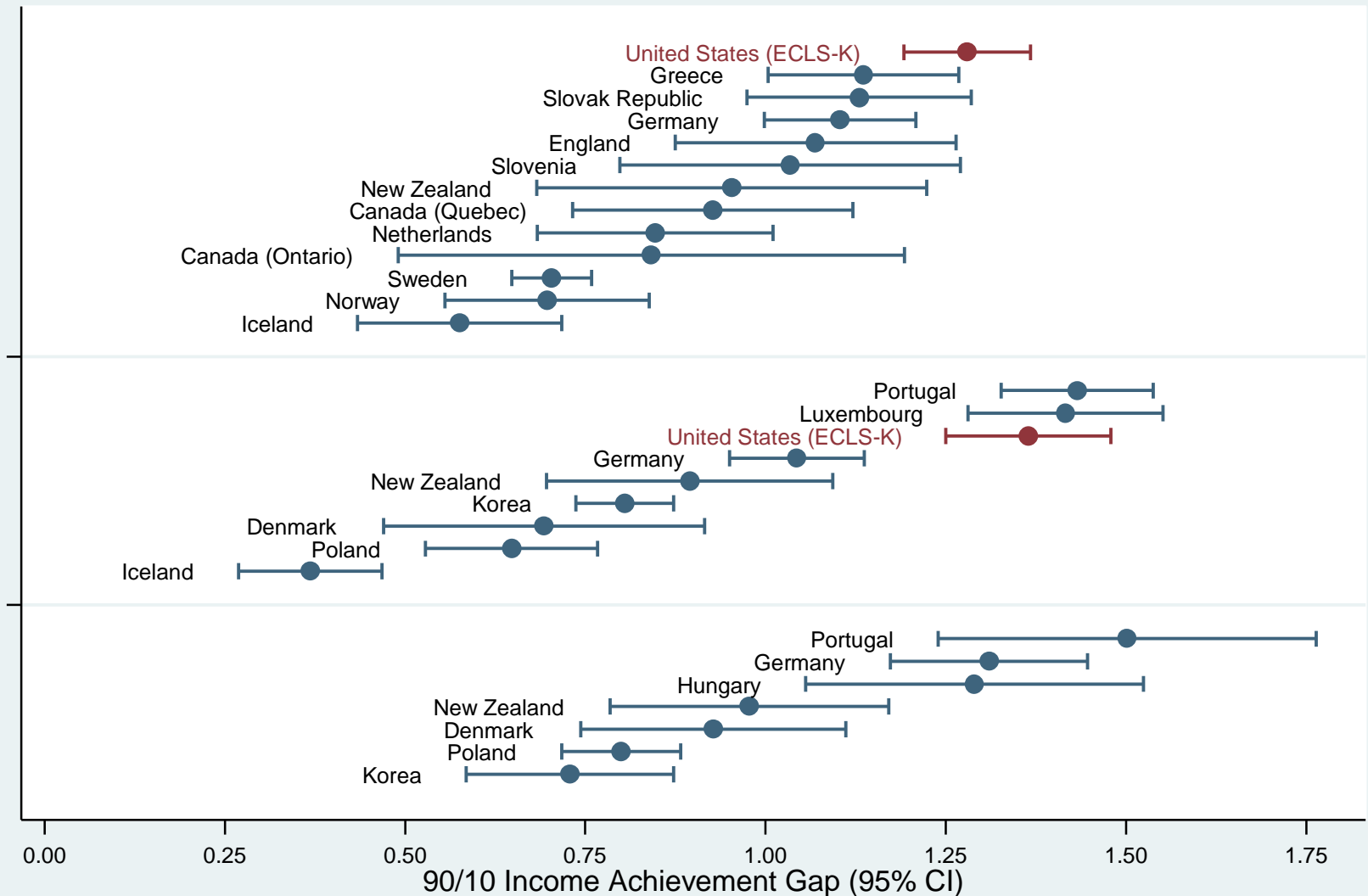
Source: Reardon (2011)

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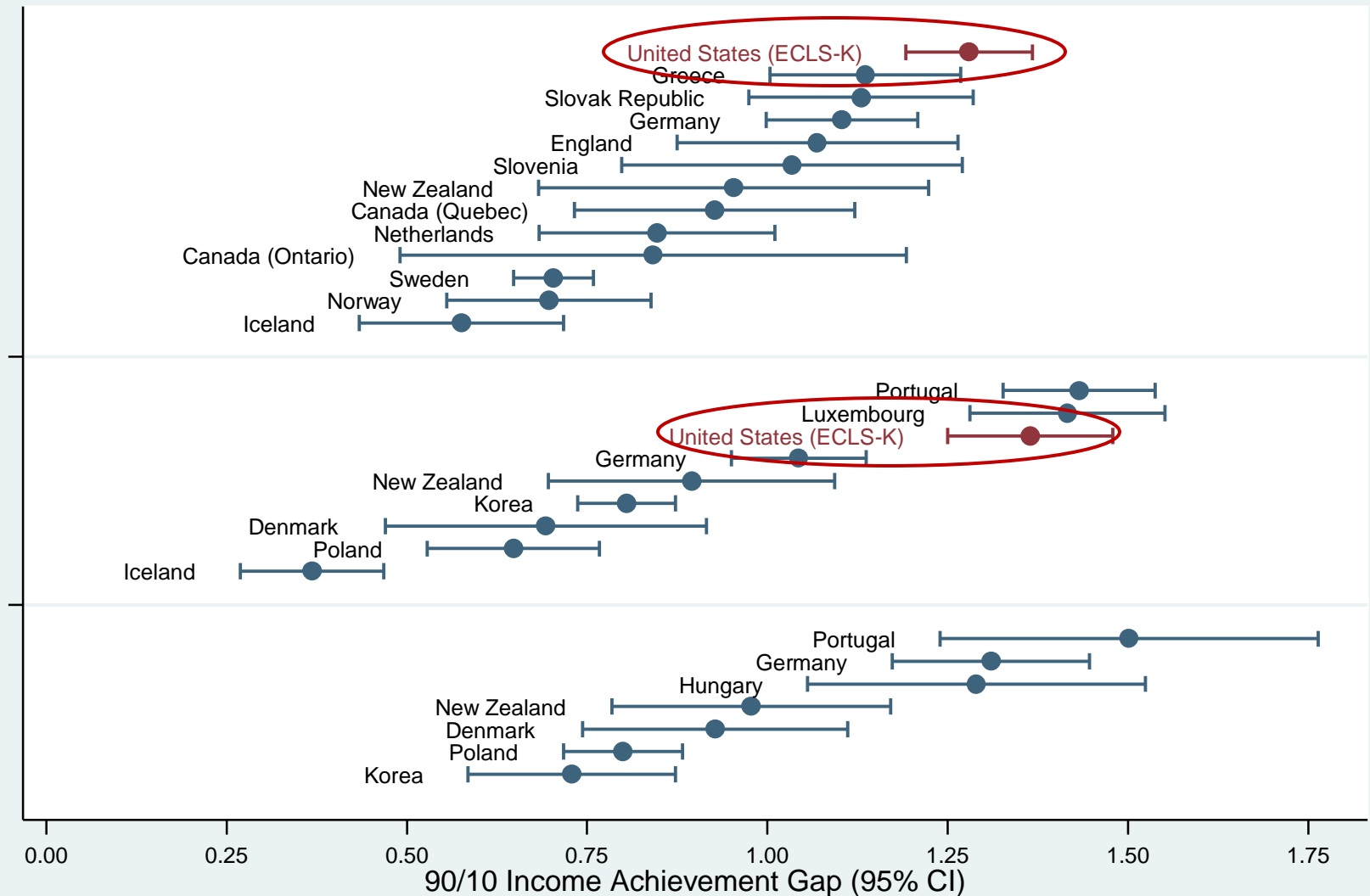


- How does the achievement gap in the US compare to the gap in other countries?

Estimated 90/10 Income Achievement Gaps, Reading, PIRLS & PISA

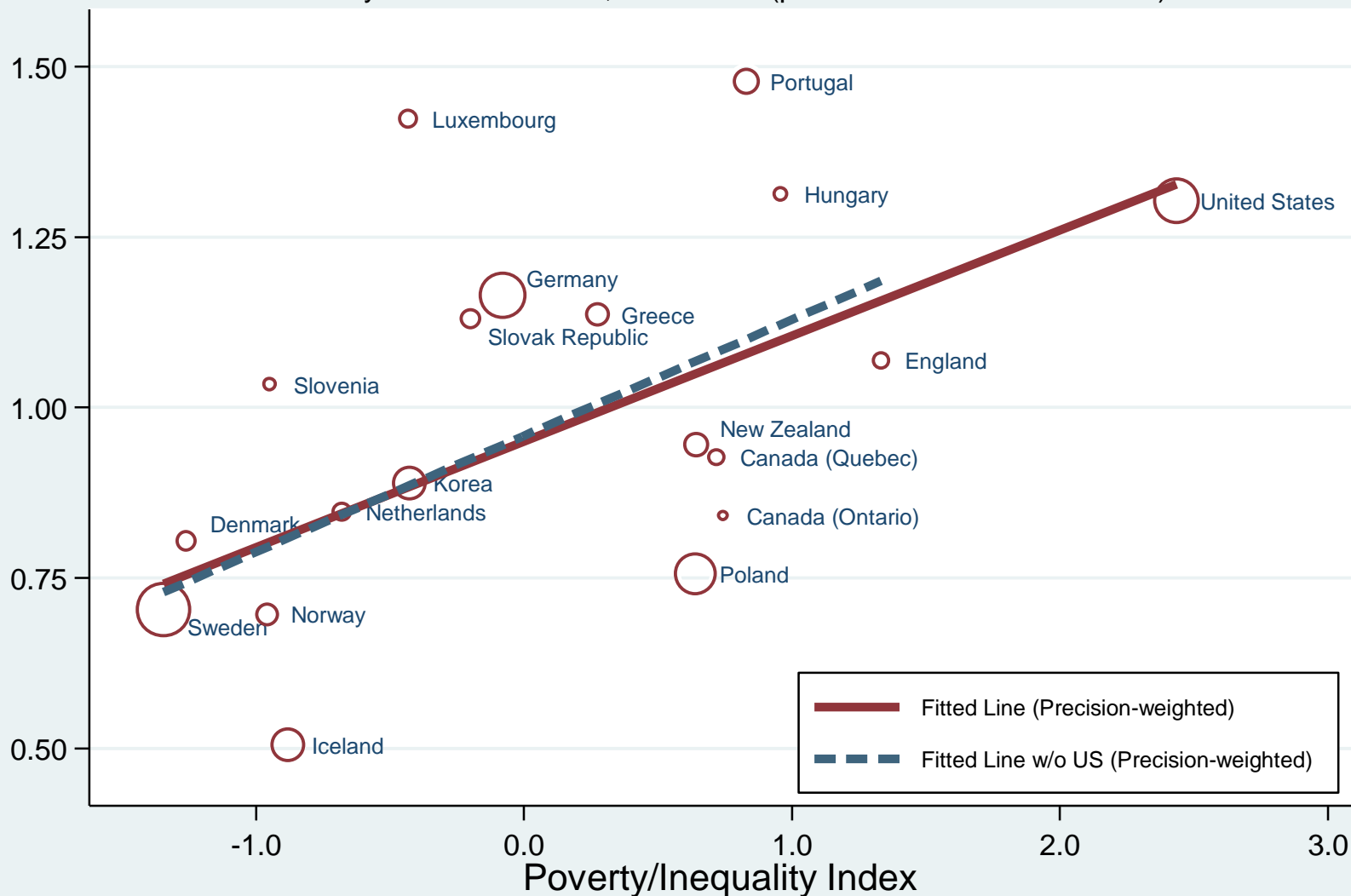


Estimated 90/10 Income Achievement Gaps, Reading, PIRLS & PISA



Association Between Income Achievement Gap and Poverty/Inequality Index

Wealthy OECD Countries, 2001-2009 (pooled PIRLS and PISA data)



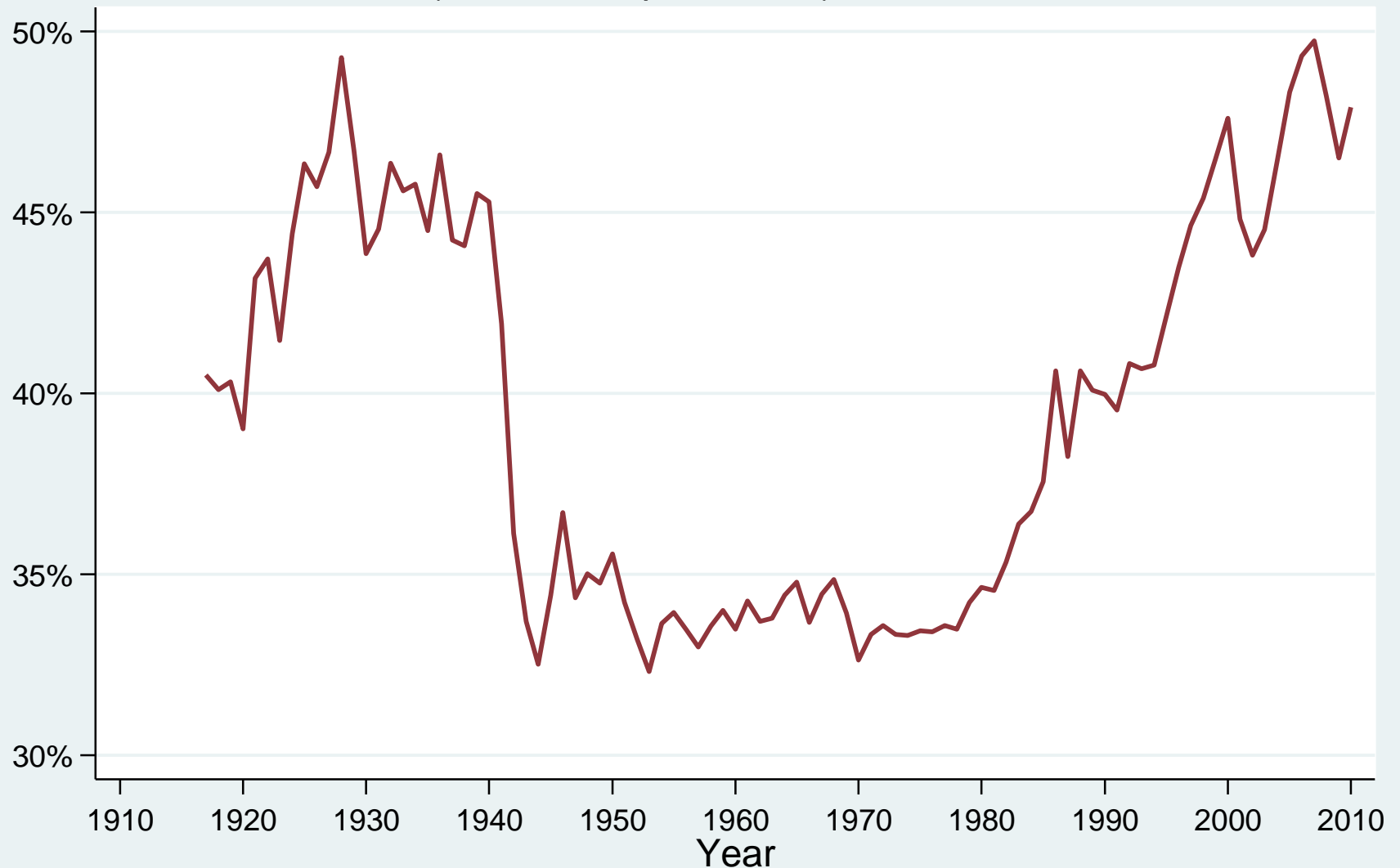
why has the income achievement gap grown?

- rising income inequality?
- changes in family investment patterns
 - ▣ rising returns to income?
 - ▣ rising investment in children's cognitive development (among high-income families)?
 - ▣ changing parenting practices?
- Increasing correlation between income and other family resources?
- increasing socioeconomic segregation?
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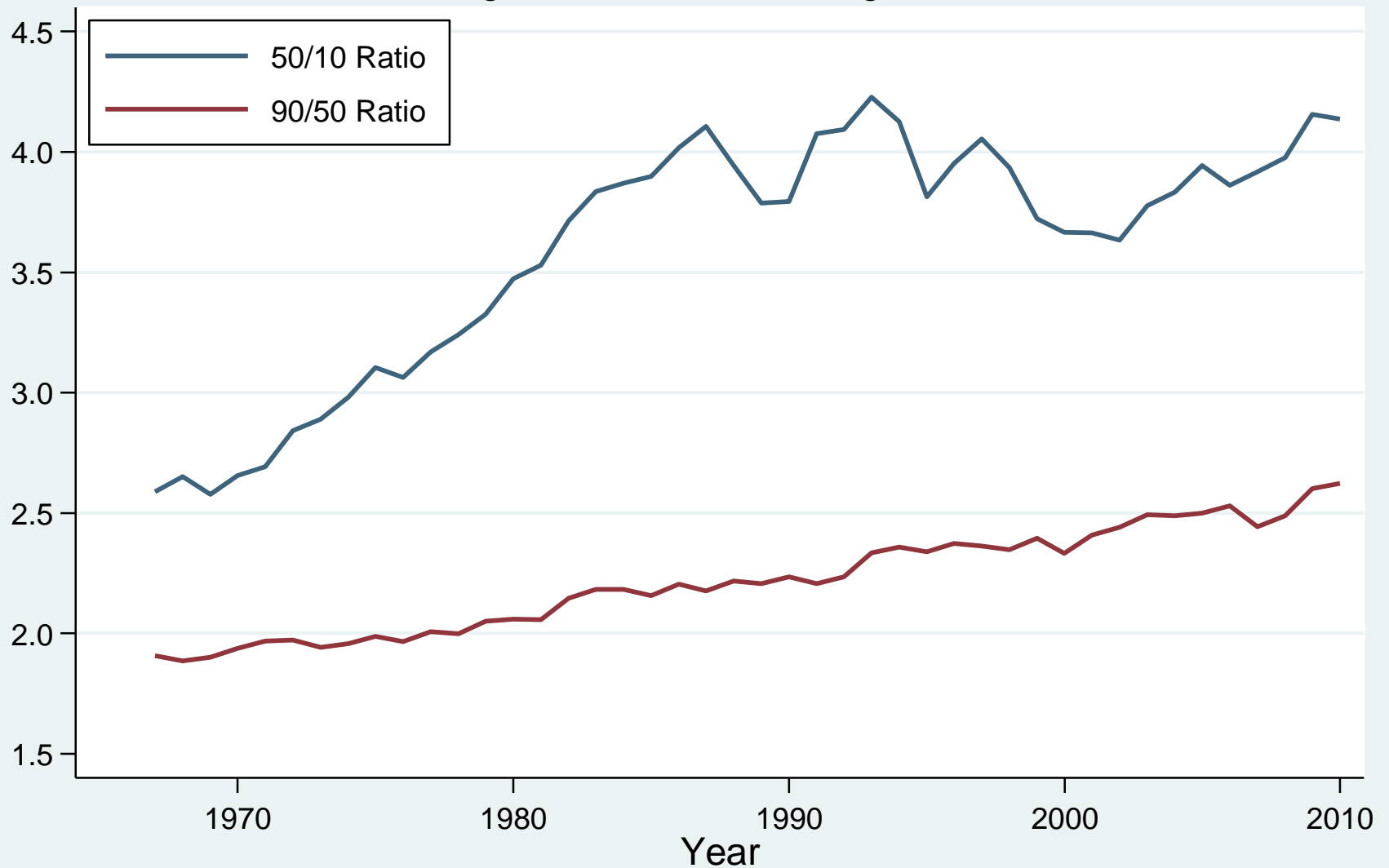
Share of Total Income Accruing to 10% Highest Income Families, (Includes Capital Gains), 1918-2010



Source: Piketty & Saez (2012): <http://www.econ.berkeley.edu/~saez/TabFig2010.xls>

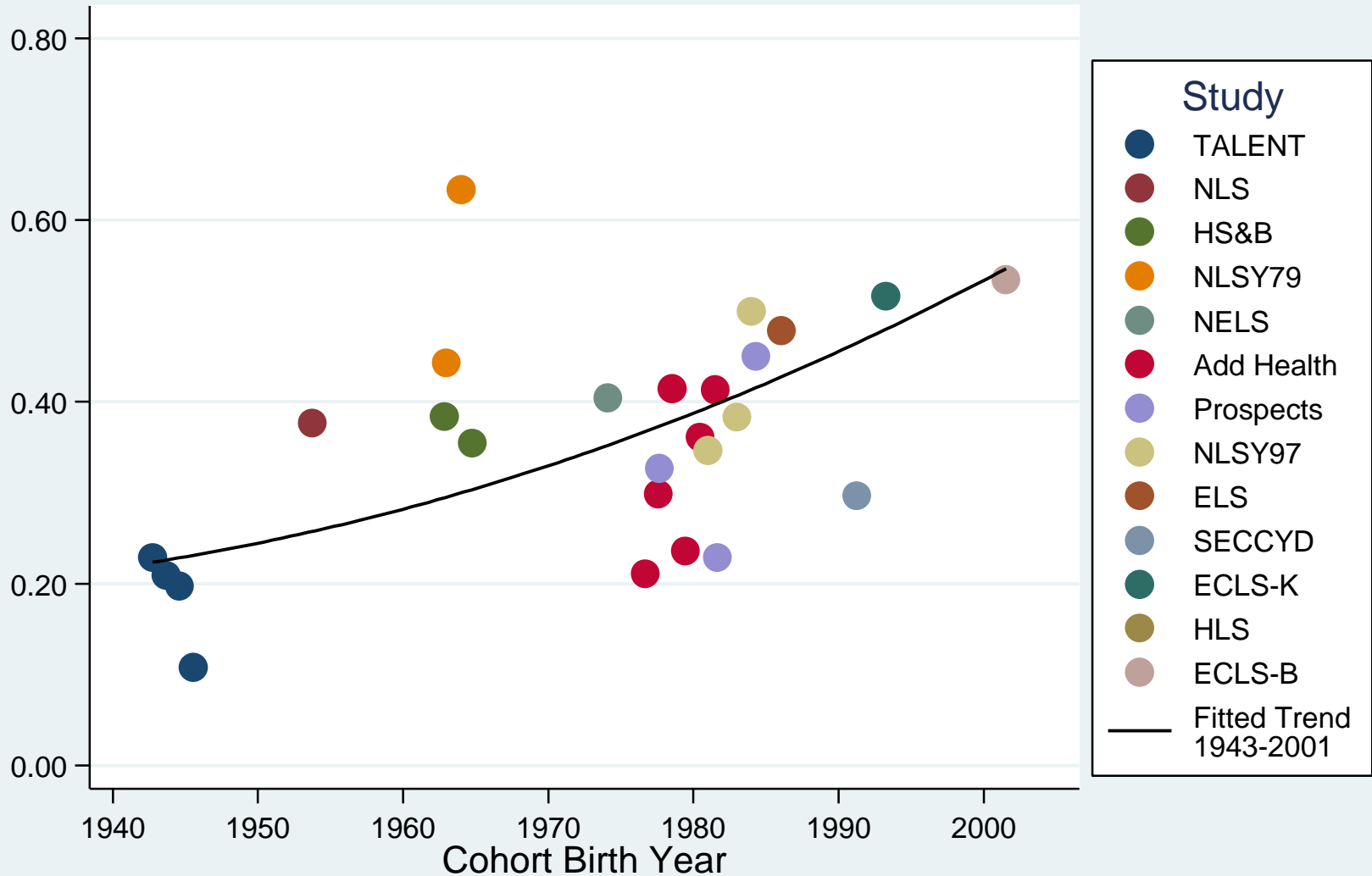
Income Inequality (50/10 and 90/50 Income Ratio), 1967-2010

Among Families of School-Age Children



Source: Author's calculations from CPS data 1968-2011

Trend in Association Between Income and Reading Achievement, Families Above Median Income, 1940-2001 Cohorts



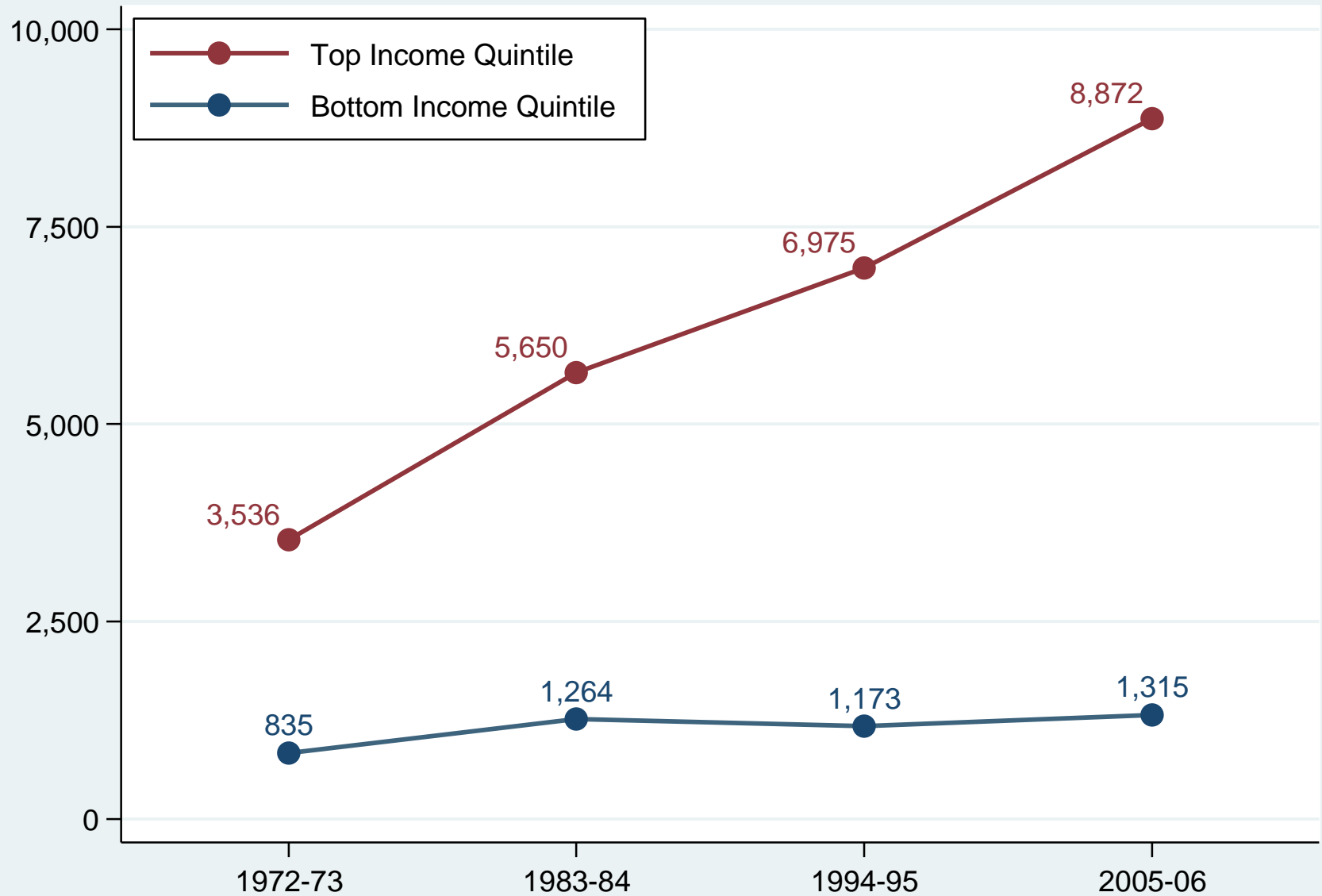
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Family Enrichment Expenditures on Children, 1972-2006



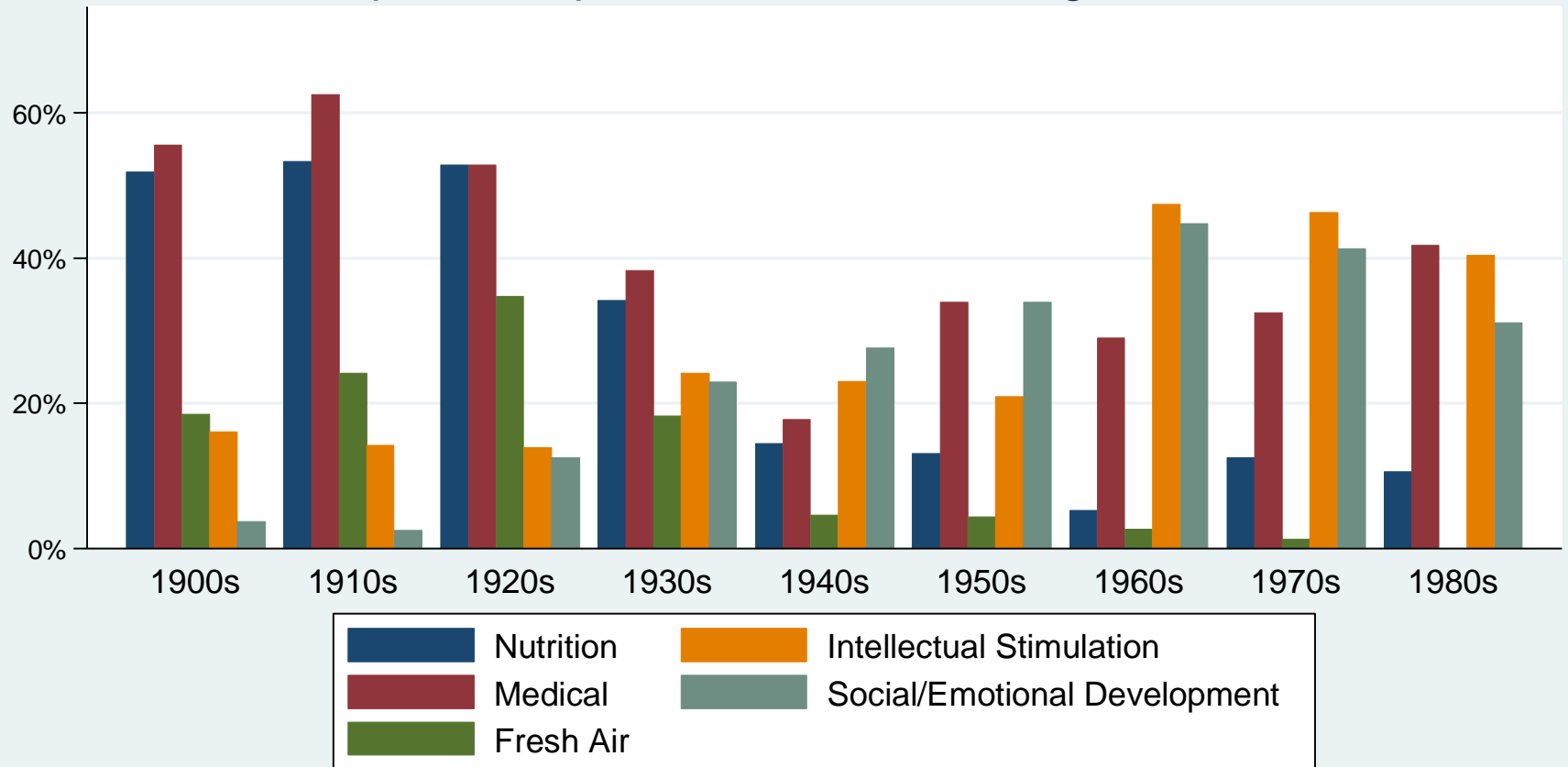
Source: Duncan & Murnane (2011)

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changing views of parenting, 1900-1985 (wrigley, 1989)

Topics of Expert Advice on Parenting, 1900-1985



Source: Wrigley, Julia. (1989). Do Young Children Need Intellectual Stimulation? Experts' Advice to Parents, 1900-1985. History of Education Quarterly 29/1:41-75 (Table 1).

changing view of parental role

- parental views of their role as parents has changed over twentieth century (wrigley, 1989; schaub, 2010)
 - ▣ increasing focus on importance of parenting for cognitive development
- some evidence of social class differences in parenting practices (lareau, 2003)
 - ▣ middle/upper-class: *concerted cultivation*
 - ▣ working-class: *accomplishment of natural growth*
- education policy may play a role, by focusing and legitimating test scores as primary goal of schooling and evidence of success (schaub, 2010)

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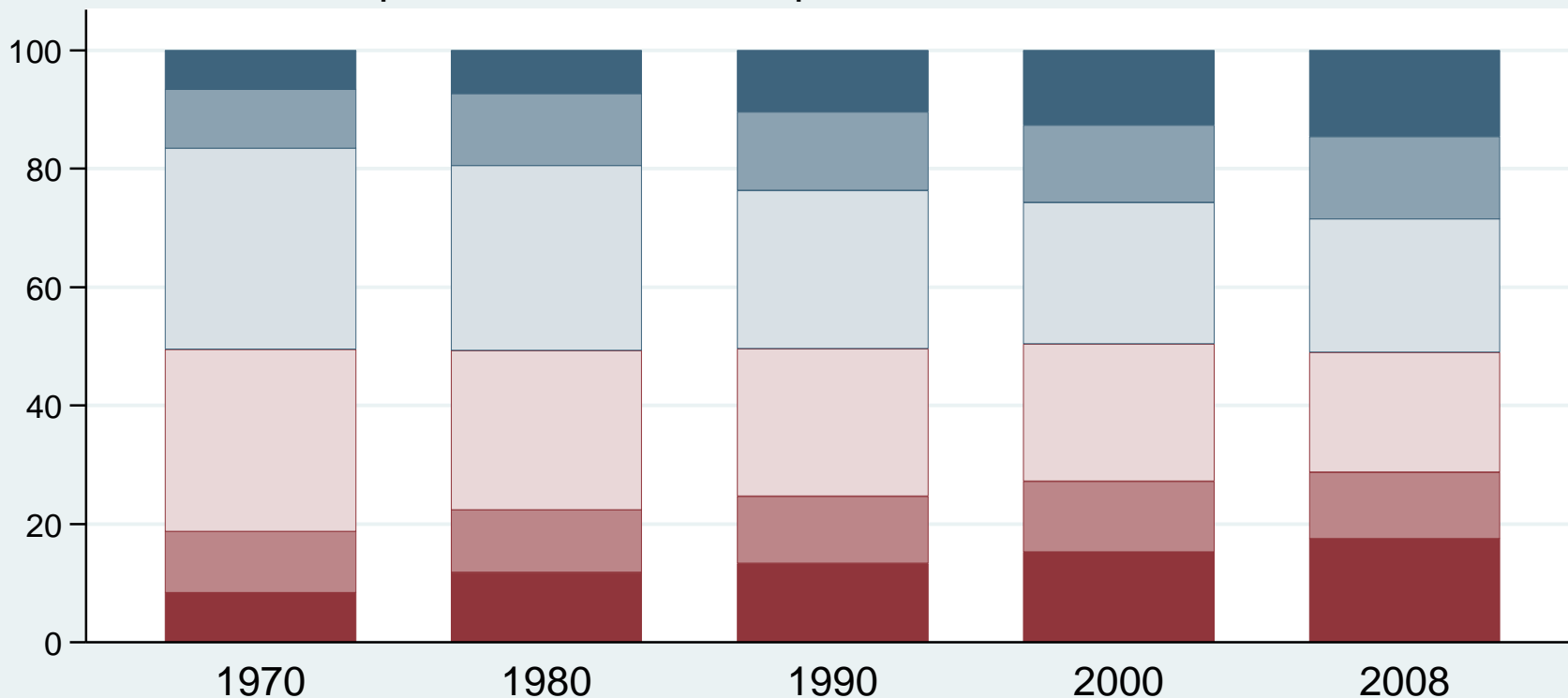
relationship between income and other family resources

- polarization of families (mclanahan 2004)
- increasing returns to college education and cognitive skill (murnane, willett, & levy, 1995)
 - ▣ income more strongly associated with parental education and cognitive skill
- increased assortative mating (schwartz & mare, 2005)
- high-income families not only have more income, but increasingly also have more of other resources that matter (dual parents, high educational attainment & cognitive skill, smaller families, fewer very young mothers)

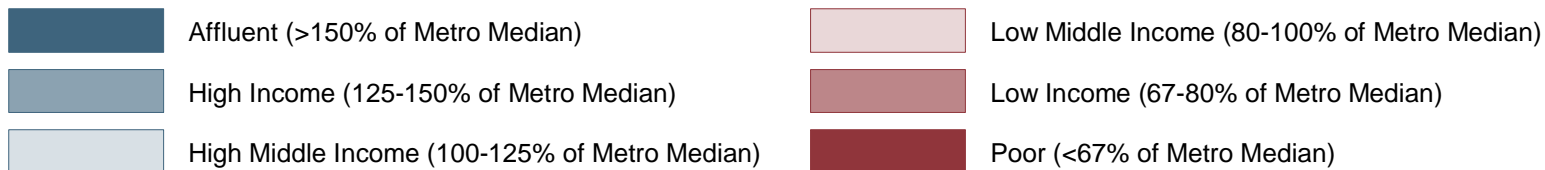
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Proportion of Families Living in High-, Middle-, and Low-Income Neighborhoods Metropolitan Areas with Population > 500,000, 1970-2008



Neighborhood Type (Based on Median Family Income Level)



summary of trends



- income achievement gaps have grown sharply in recent decades (since 1970s birth cohorts, maybe before)
- income gaps have grown most rapidly in the top half of the income distribution
- income gaps now larger than black-white gap
- gaps present when students start school (at least in recent cohorts; no data on earlier cohorts)

inequality and education

- differences in inequality, coupled with a stable association between income and educational achievement, seems insufficient to explain the patterns of association between inequality and income achievement gaps
- rather, the association between income and achievement has changed as well
- but why?

a provisional hypothesis

- For young workers, the returns to a college degree doubled from 1980-2000 (card & lemieux, 2001)
- The increasing importance of education in the labor market and economic mobility have made educational success ever more important
 - ▣ This **changes parental behavior/investment** – changes how parents think about children
 - ▣ It also changes how we think about **the role of schools**—increased focus on academic success (as measured by test scores)
- This leads to increased competition for educational advantage
 - ▣ Money (and other forms of capital) is an advantage in this competition
 - ▣ So income matters more than before (i.e., β is larger)

implications

- the link between family income and children's achievement, coupled with the increasing importance of cognitive skills in determining earnings, produces a feedback cycle that leads to low socioeconomic mobility and growing inequality.
- this feedback cycle may operate partly through schooling, though schools (in a narrow, functional sense) do not appear to be a primary cause of this trend
- nor is it clear that schools (alone) can reverse this trend, though they may be a helpful mechanism.

policy implications

- reduce economic inequality
- greater investment in early childhood
 - ▣ prevent development of gaps (easier than remedying later)
 - ▣ most cost-effective developmental age for investment
 - ▣ means-targeted programs likely most cost-effective (though maybe less politically feasible?)
- support for low-income families
 - ▣ repair/strengthen social safety net
 - ▣ programs to develop parenting skills (e.g., Nurse-Family Partnership)
- increase education policy focus on students from low-income families and communities
 - ▣ develop and test strategies for improving instruction/learning for low-income students