

income, inequality,
and educational outcomes:
u.s. and international evidence

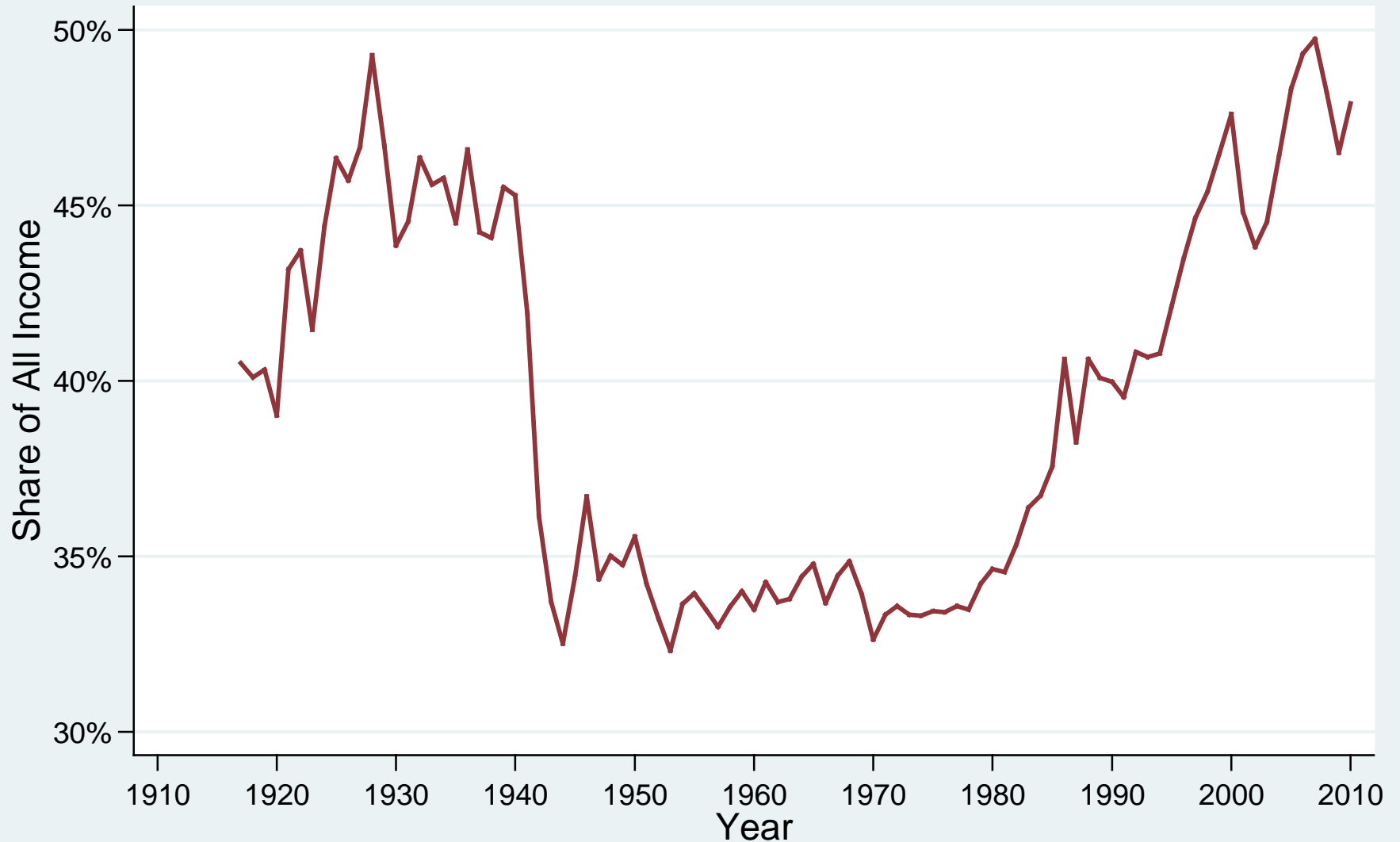
sean f. reardon
stanford university

october, 2012

Some Stylized Facts (U.S.), 1970-2010

- **Income inequality has grown, but the timing of the growth depends on who and where in the income distribution we look at**

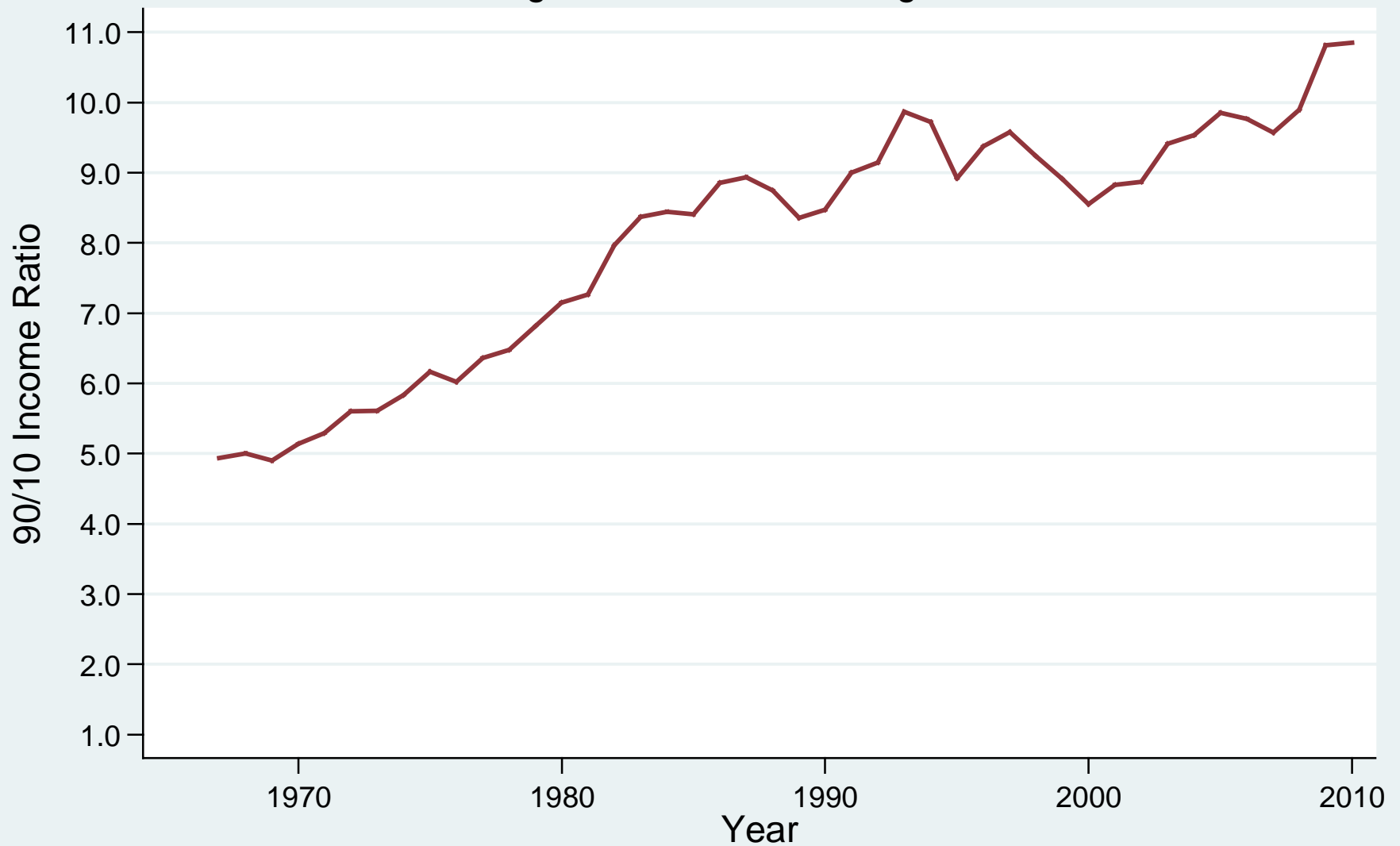
Share of Total Income Accruing to 10% Highest Income Families, (Includes Capital Gains), 1918-2010



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

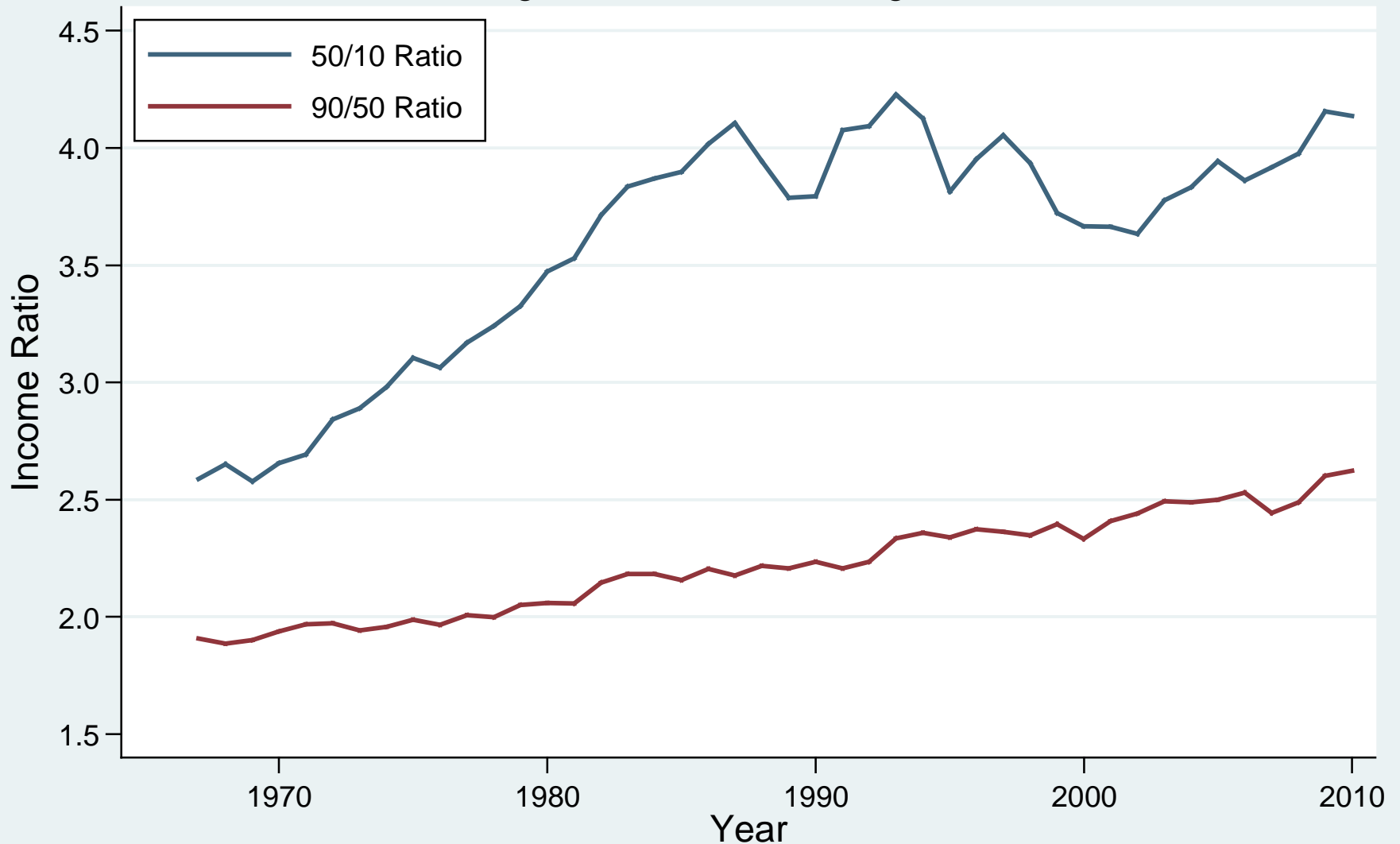
Income Inequality (90/10 Income Ratio), 1967-2010

Among Families of School-Age Children



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

Income Inequality (50/10 and 90/50 Income Ratio), 1967-2010 Among Families of School-Age Children



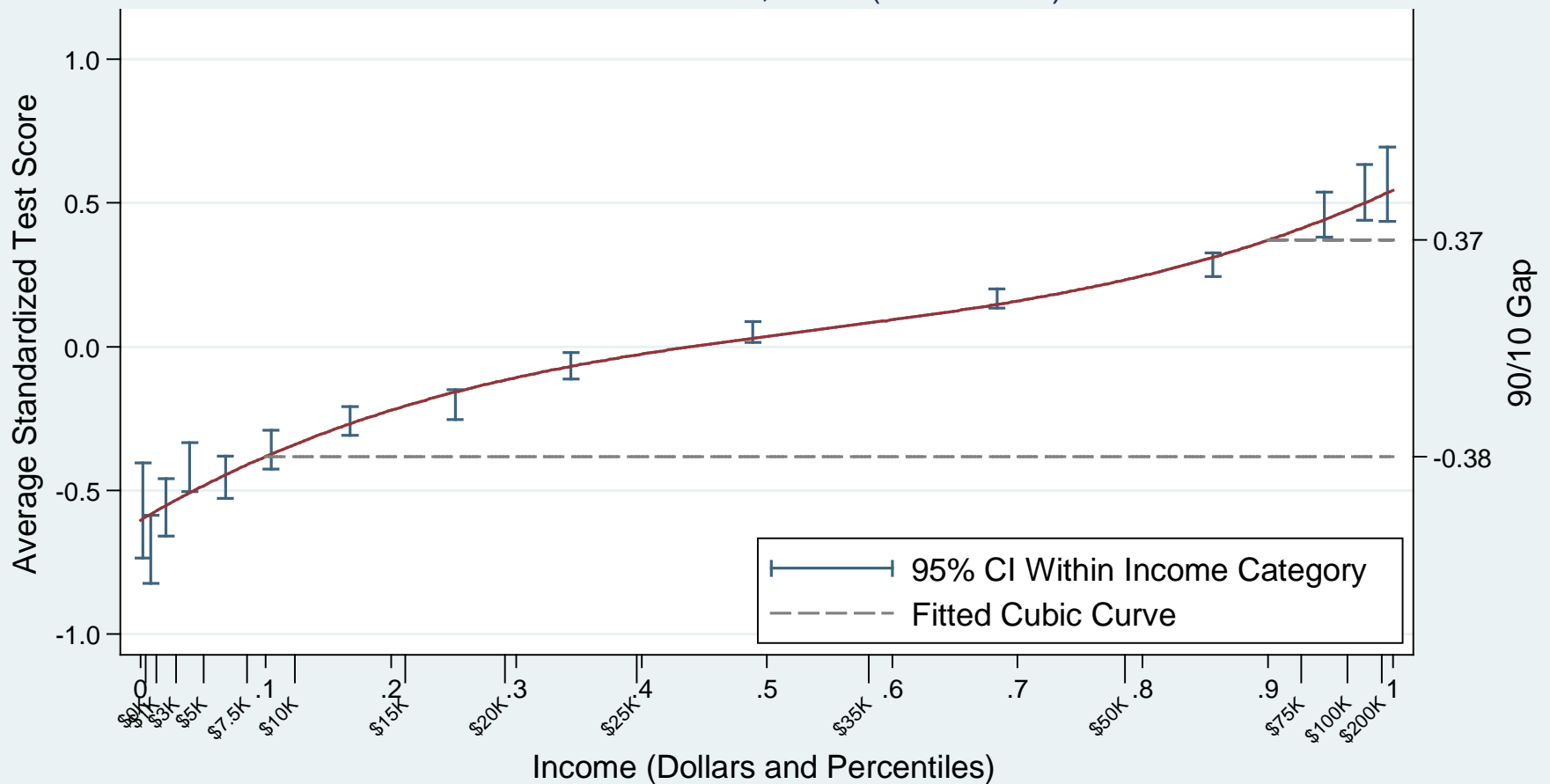
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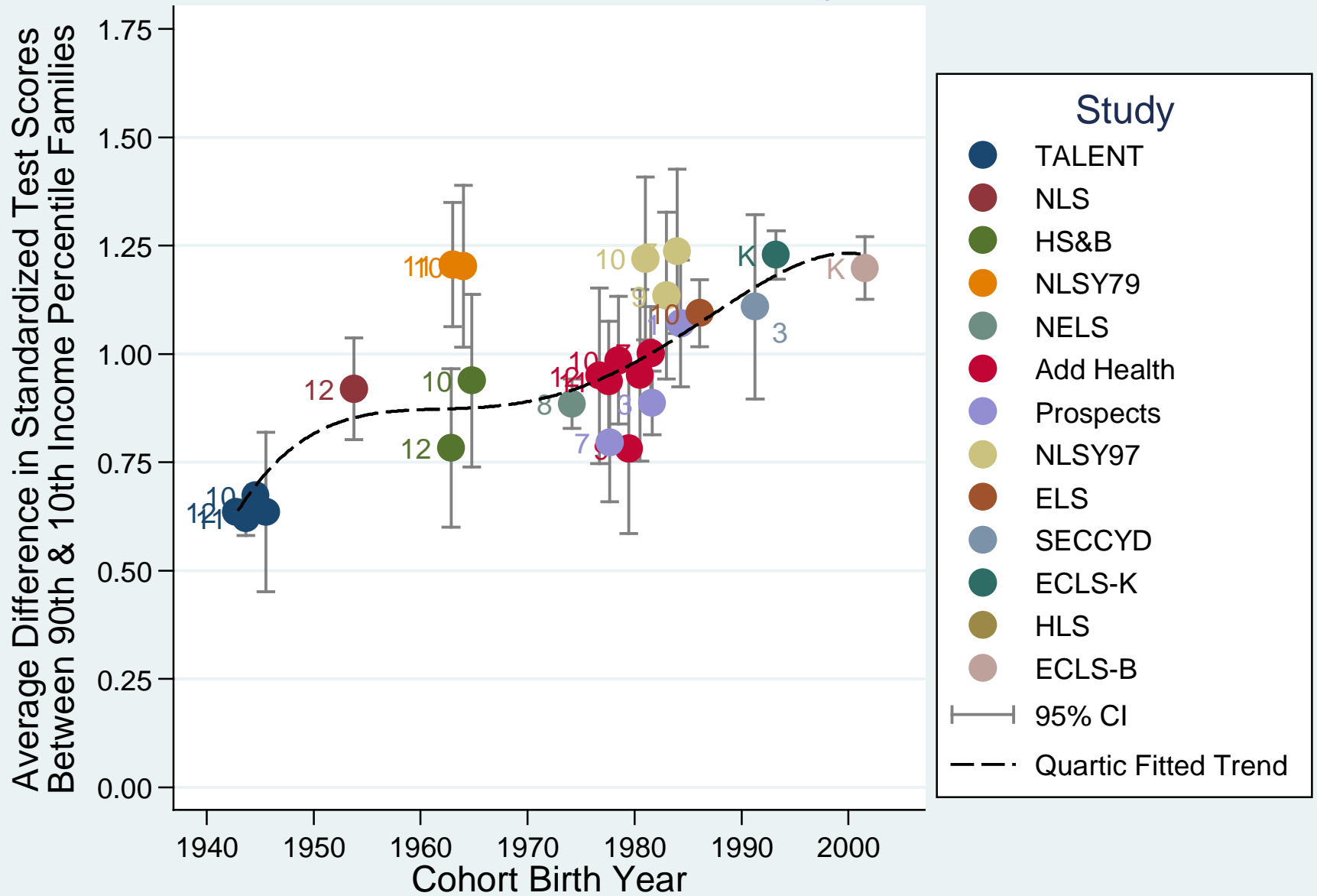
- Income inequality has grown, but the timing of the growth depends on who and where in the income distribution we look at
- **Income achievement gap has grown while black-white gap has narrowed**

computing income achievement gaps

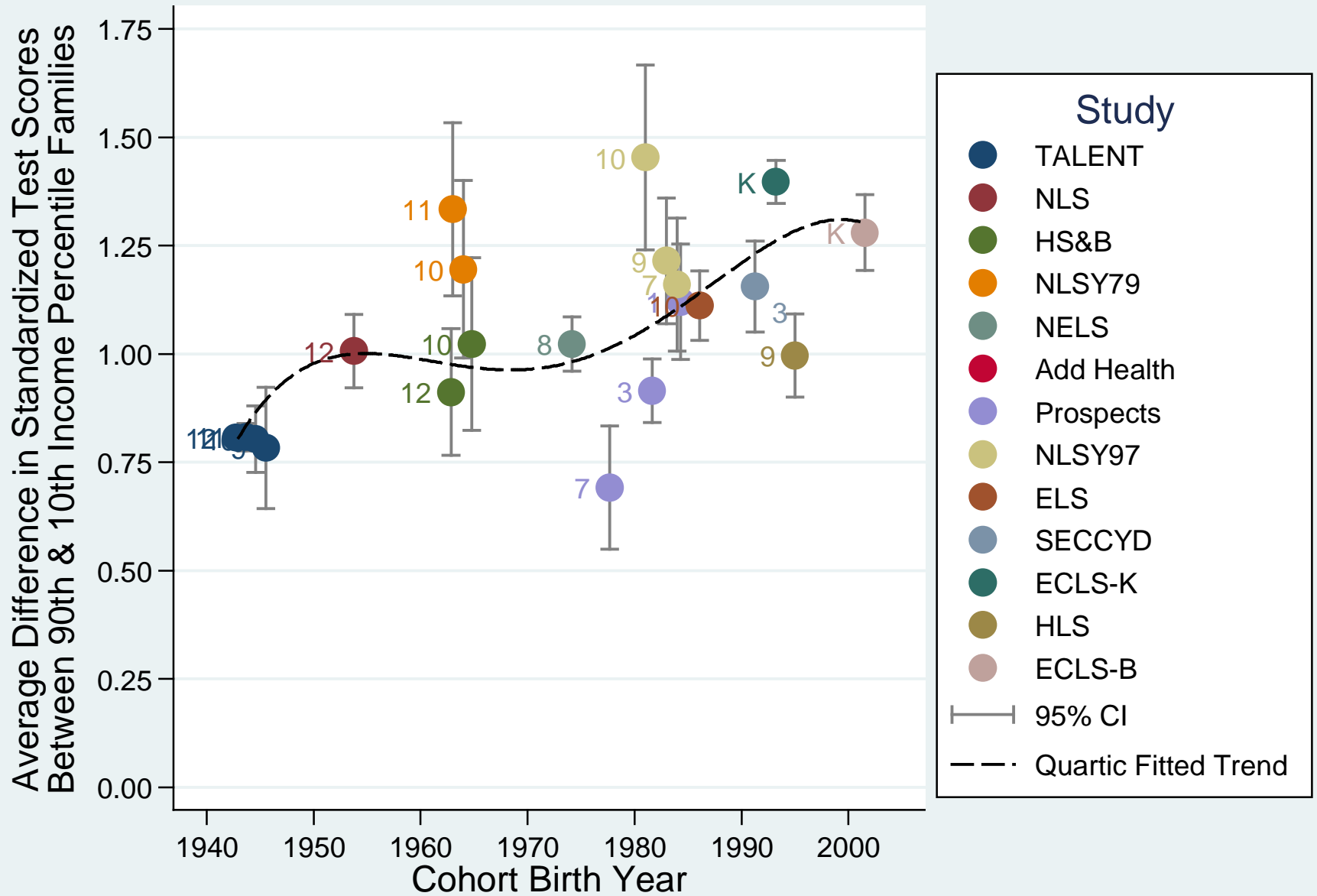
Association Between Reading Score and Family Income Percentile, Grade 8 Students, 1988 (NELS data)



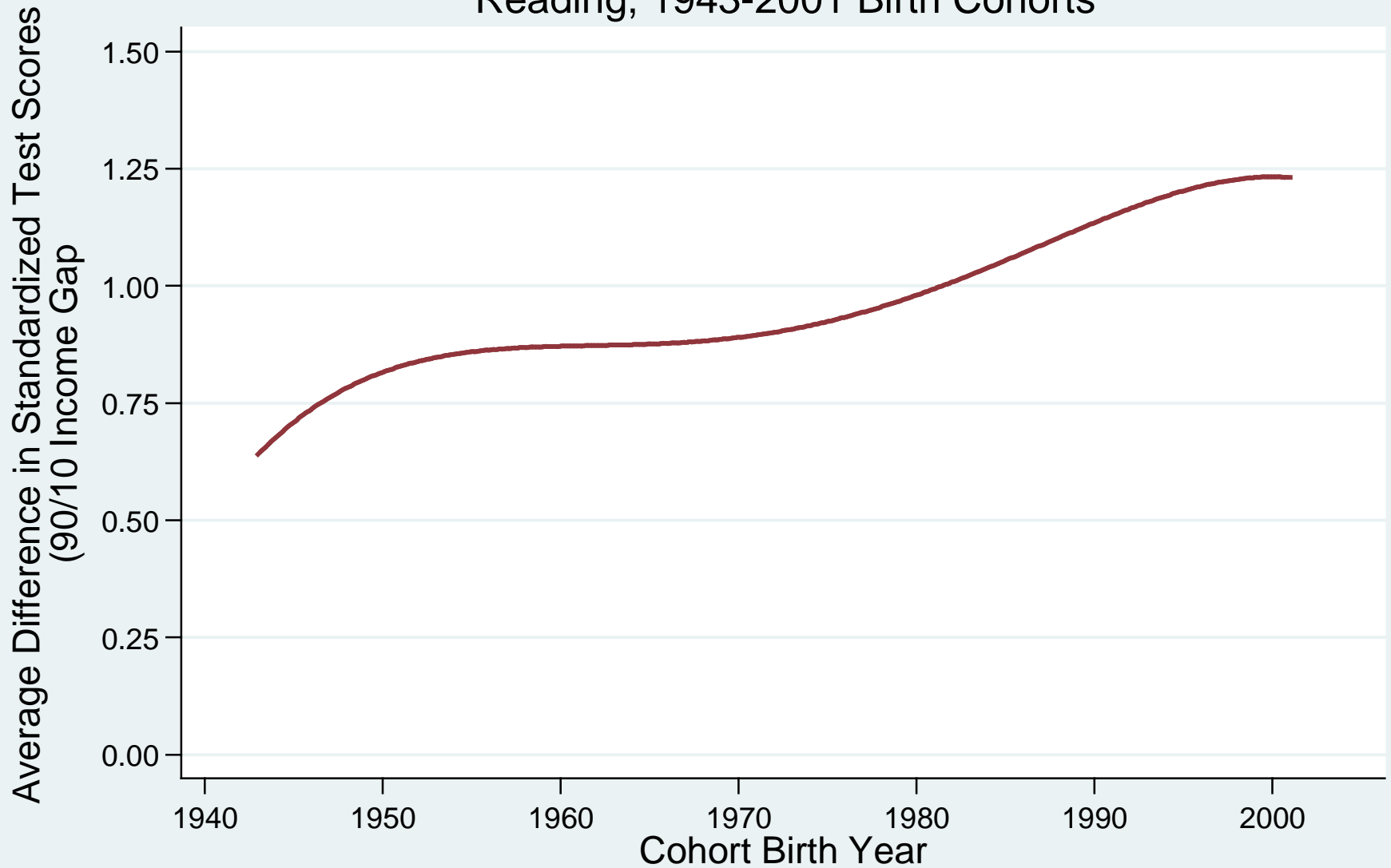
Trend in 90/10 Income Gap in Reading, 1940-2001 Cohorts



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



Income Achievement Gap (90/10 Gap) Reading, 1943-2001 Birth Cohorts

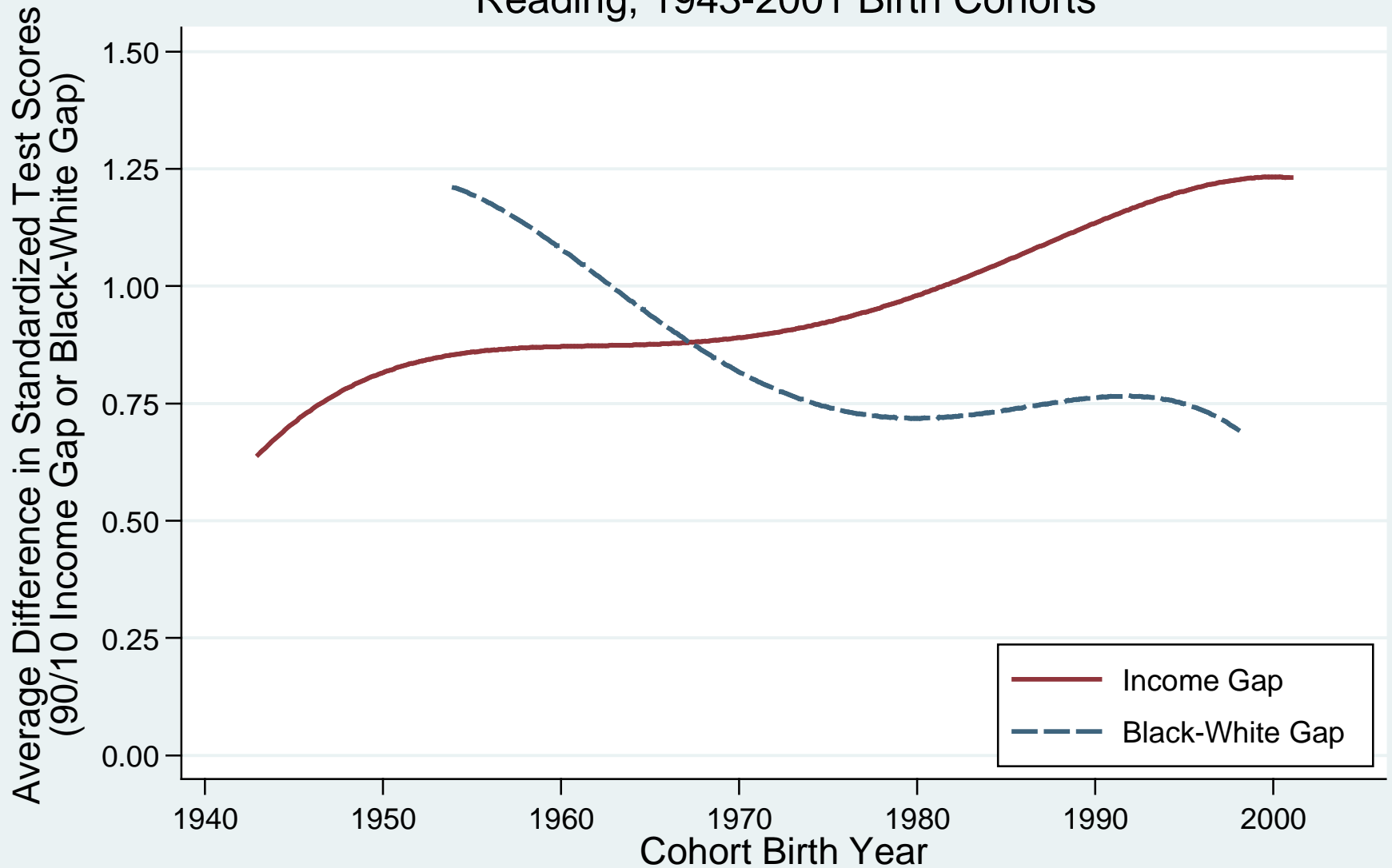


Source: Reardon (2011)

how large are these gaps?

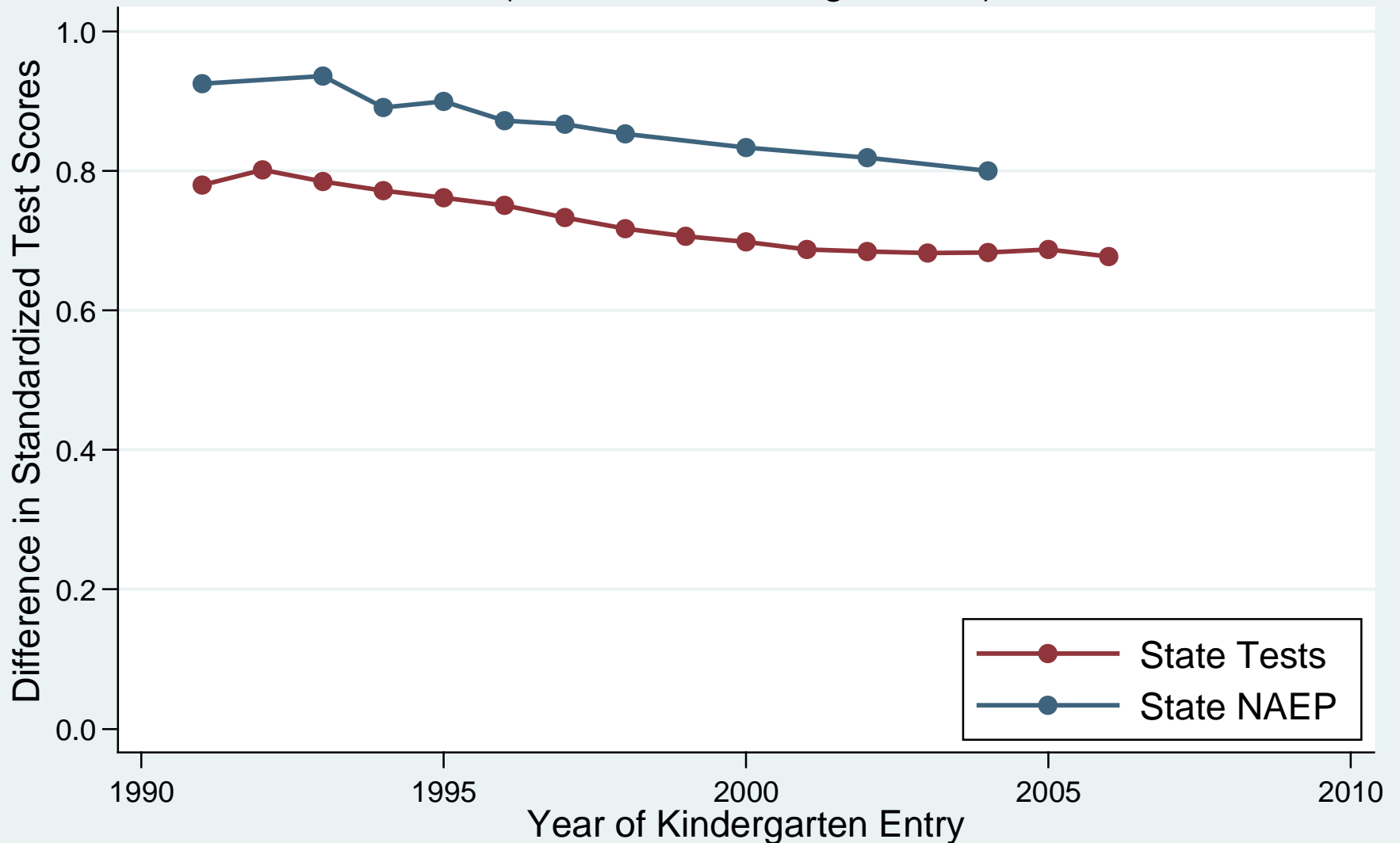
- one standard deviation is the difference between the 31st and 69th percentile
- if the gap is one standard deviation, this implies that the average student in a family at the 10th percentile of the income distribution has test scores lower than 84% of students in families at the 90th percentile of 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
- compare to black/white gap
- compare to other countries

Income Achievement Gap and Black-White Achievement Gap Reading, 1943-2001 Birth Cohorts



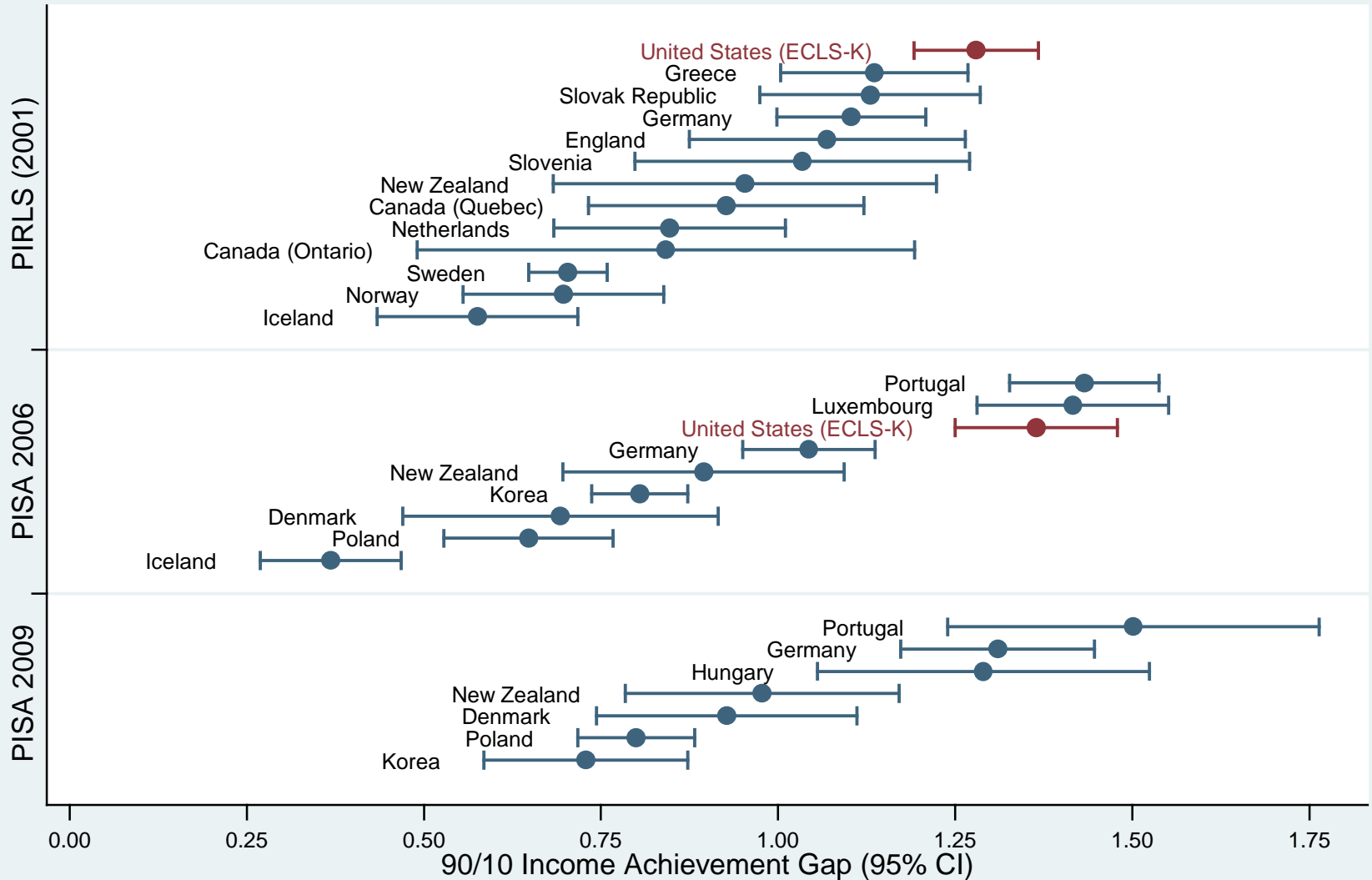
Source: Reardon (2011)

White-Black Achievement Gap, 1991-2006 Kindergarten Cohorts (Math and Reading Pooled)

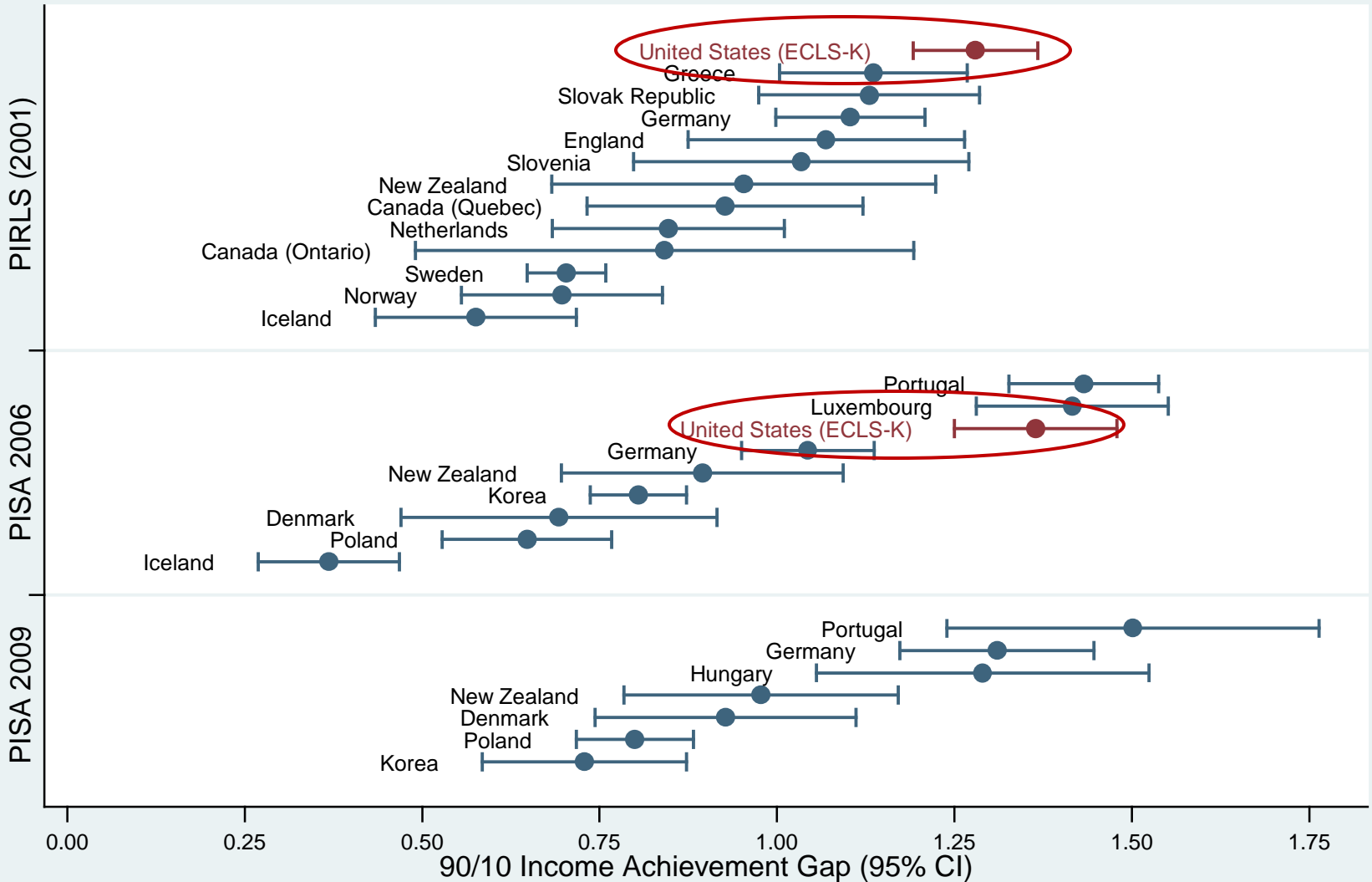


Source: Reardon et al (2012)

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



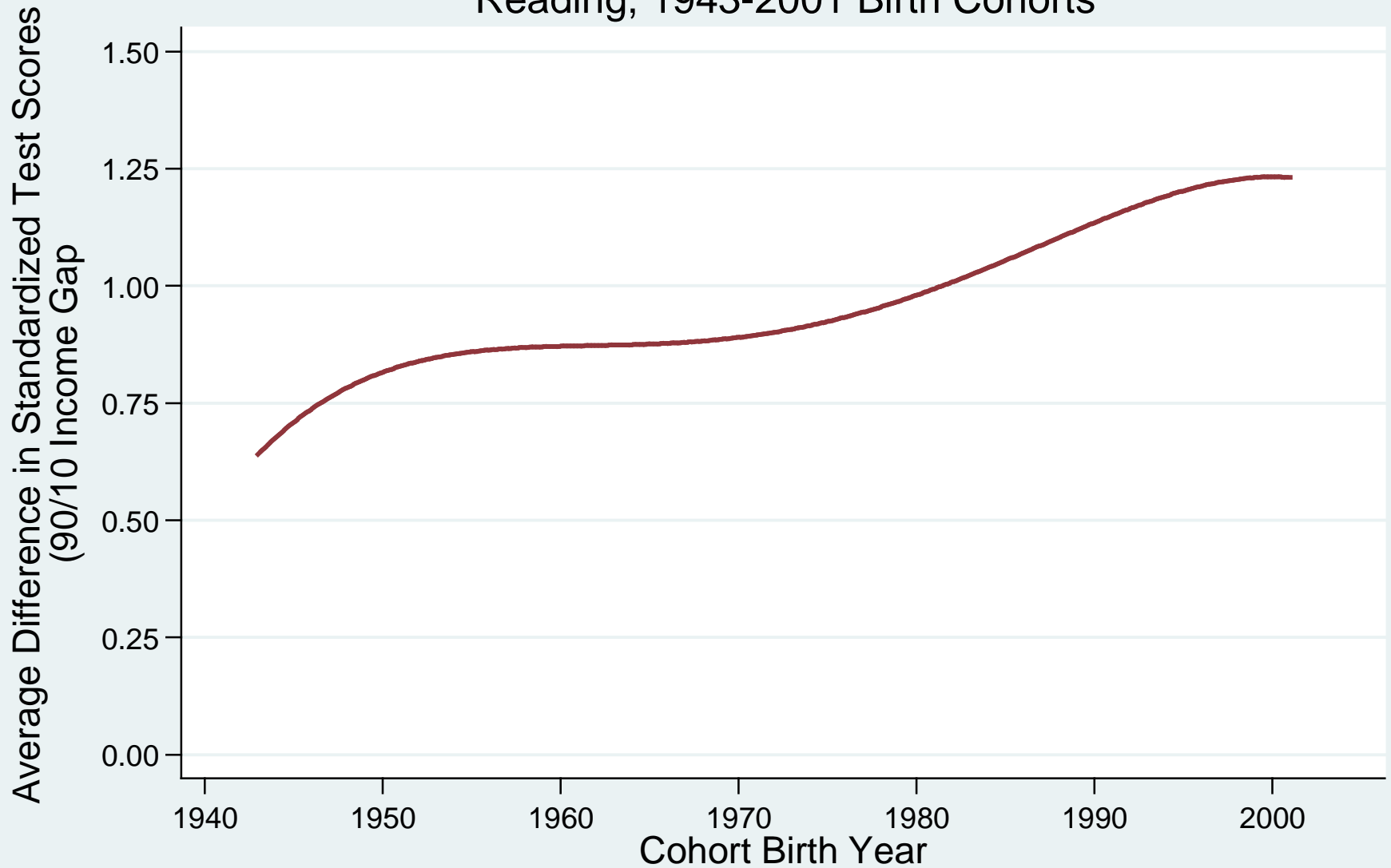
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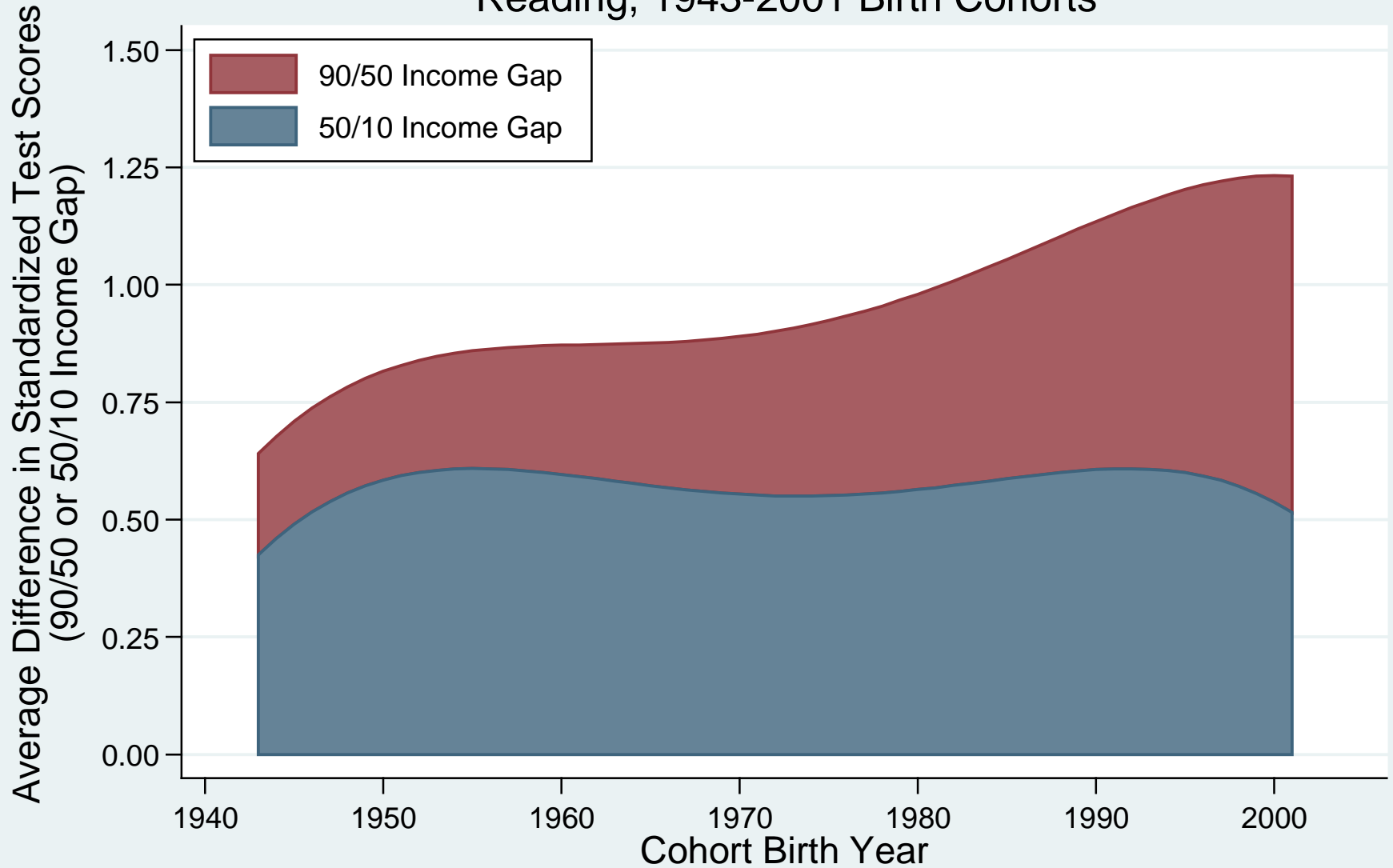
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- **Most of the growth in the income achievement gap is at the high end of the income distribution**

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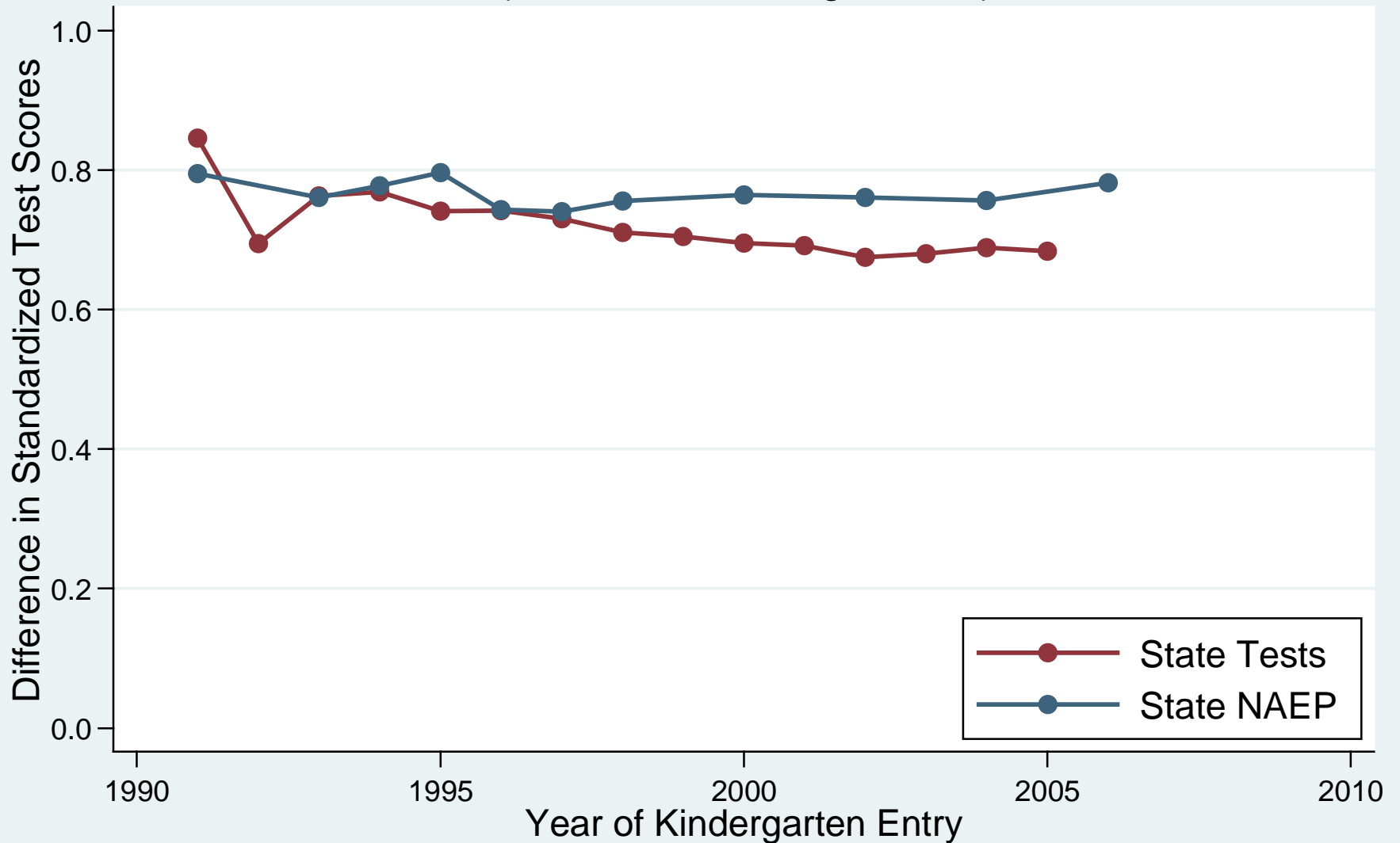
Source: Reardon (2011)

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



Source: Reardon (2011)

Non-Poor/Poor Achievement Gap, 1991-2006 Kindergarten Cohorts (Math and Reading Pooled)

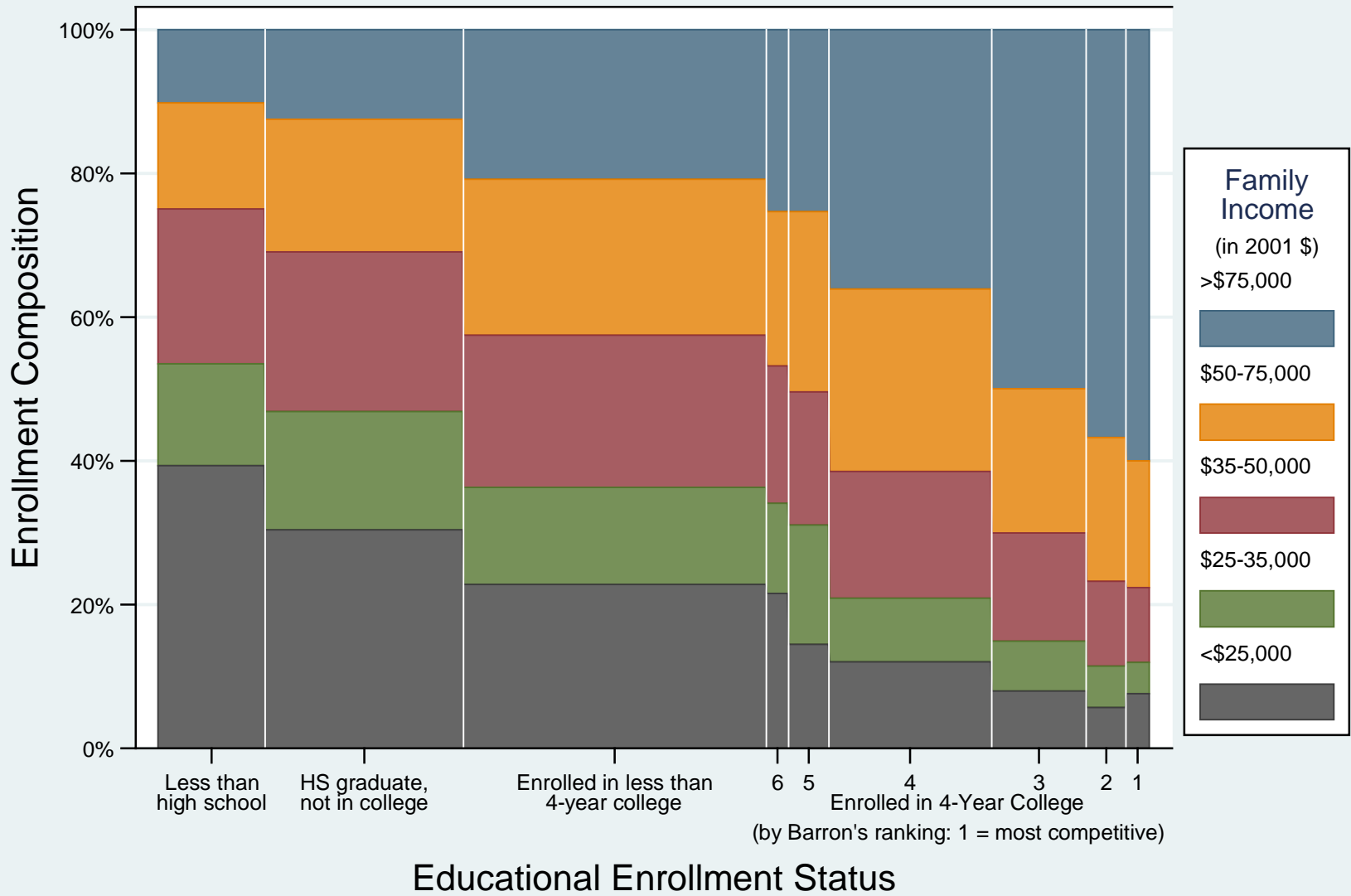


Source: Reardon et al (2012)

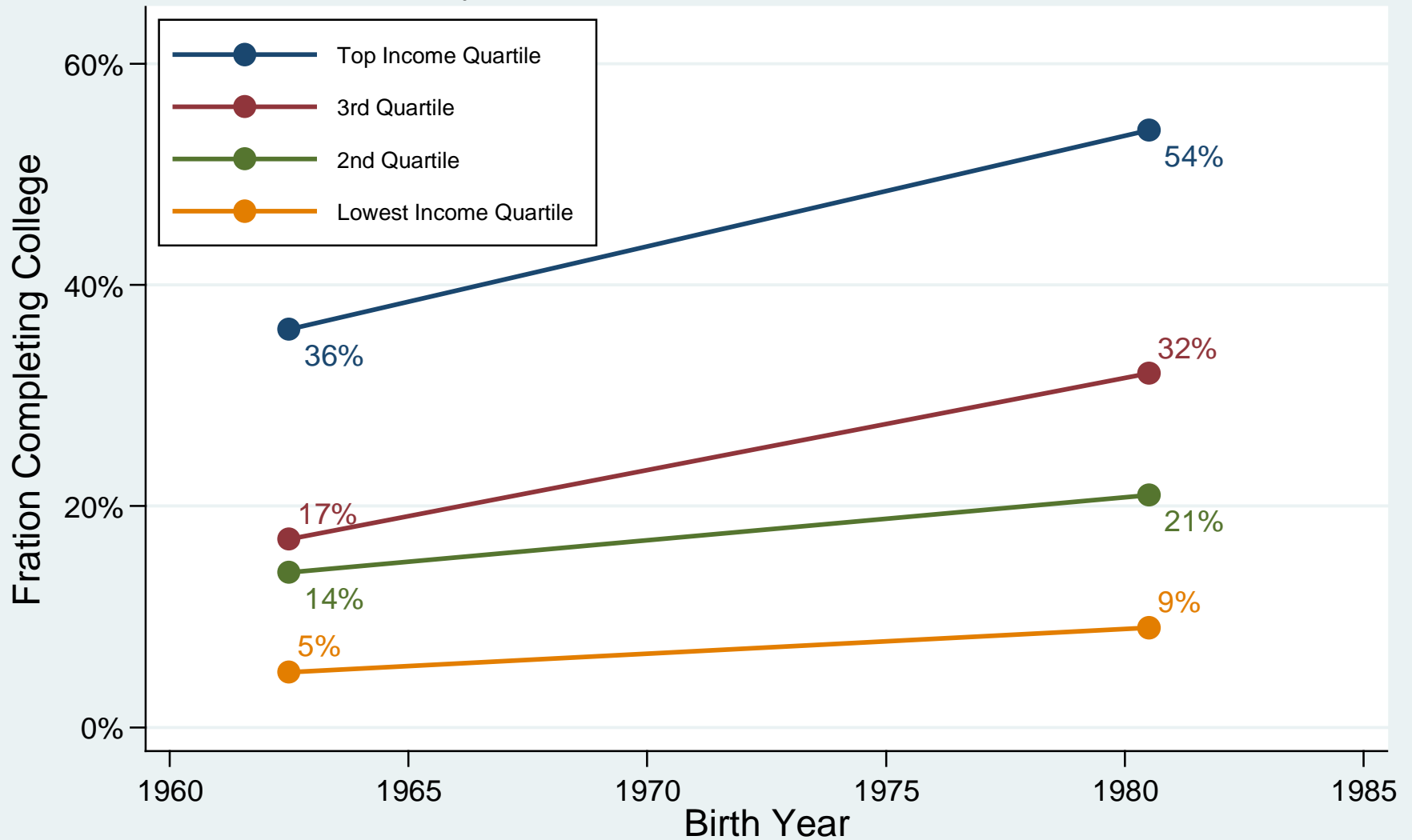
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- **College enrollment gap by income has grown as well**

Income Composition of Postsecondary Destinations, Class of 2004



Fraction of Students Completing College by Income Quartile and Year of Birth



Source: Bailey and Dynarski (2011)

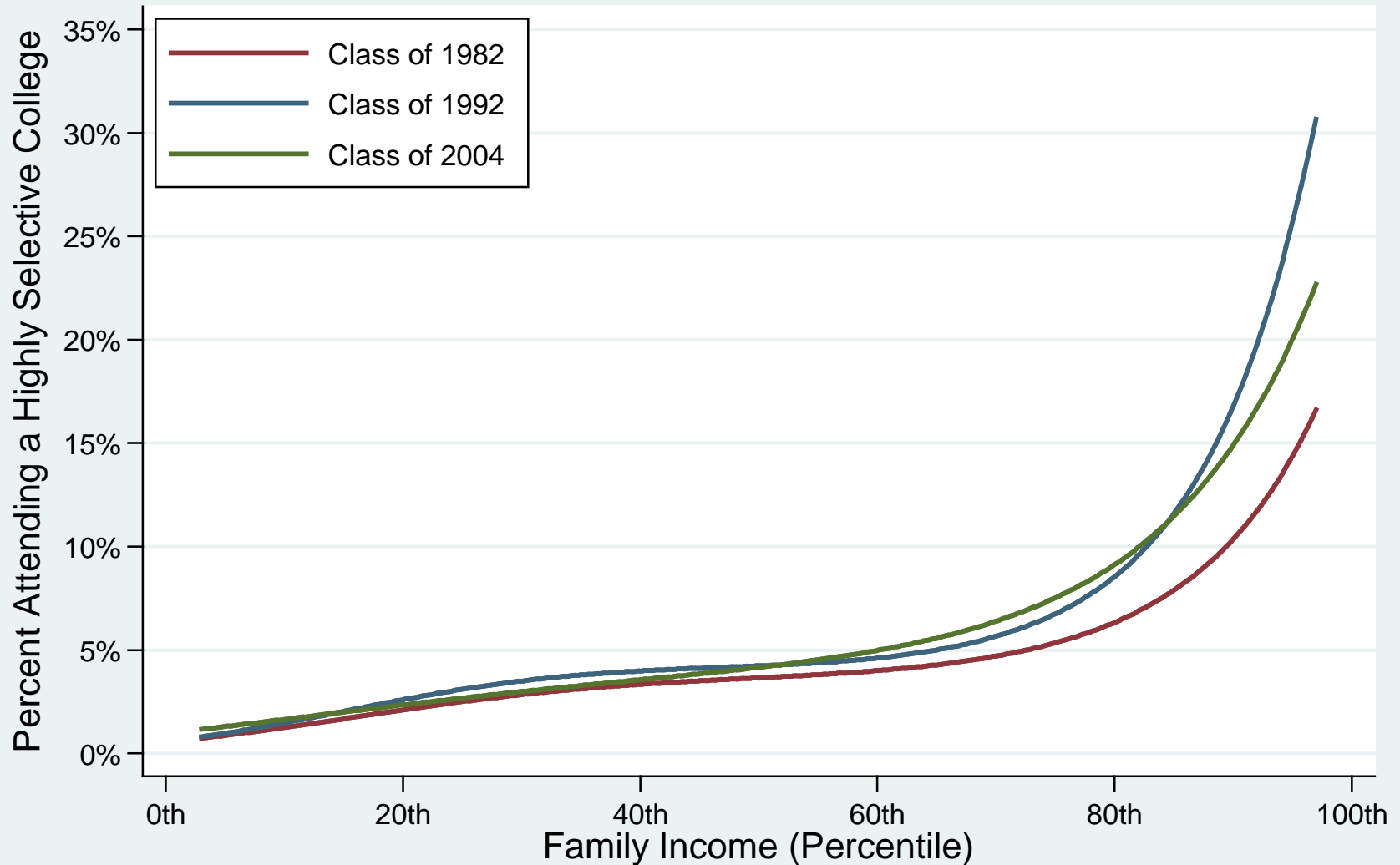
Probability of Attending a Highly Selective College, By Income and High School Graduation Year, 1982-2004



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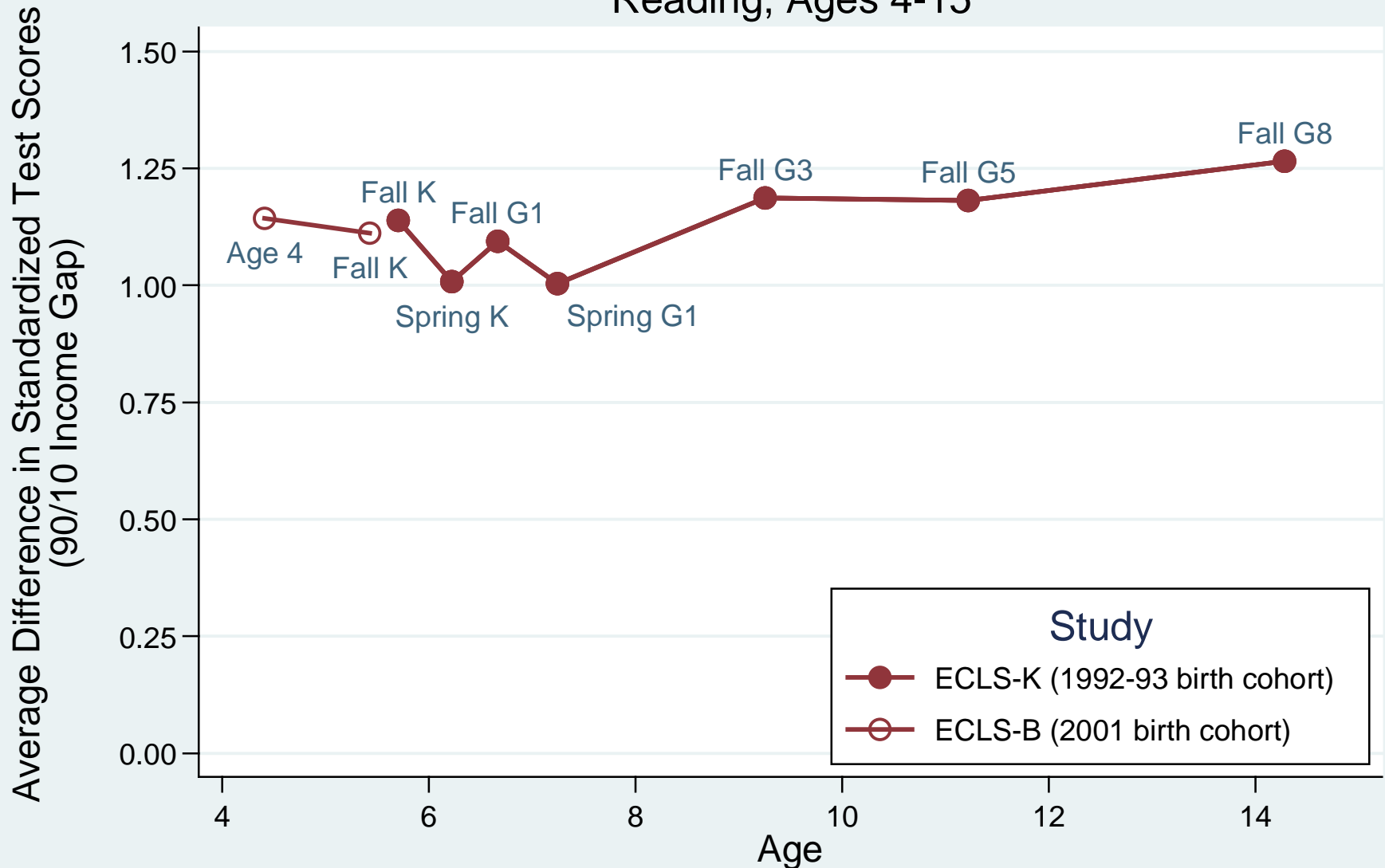
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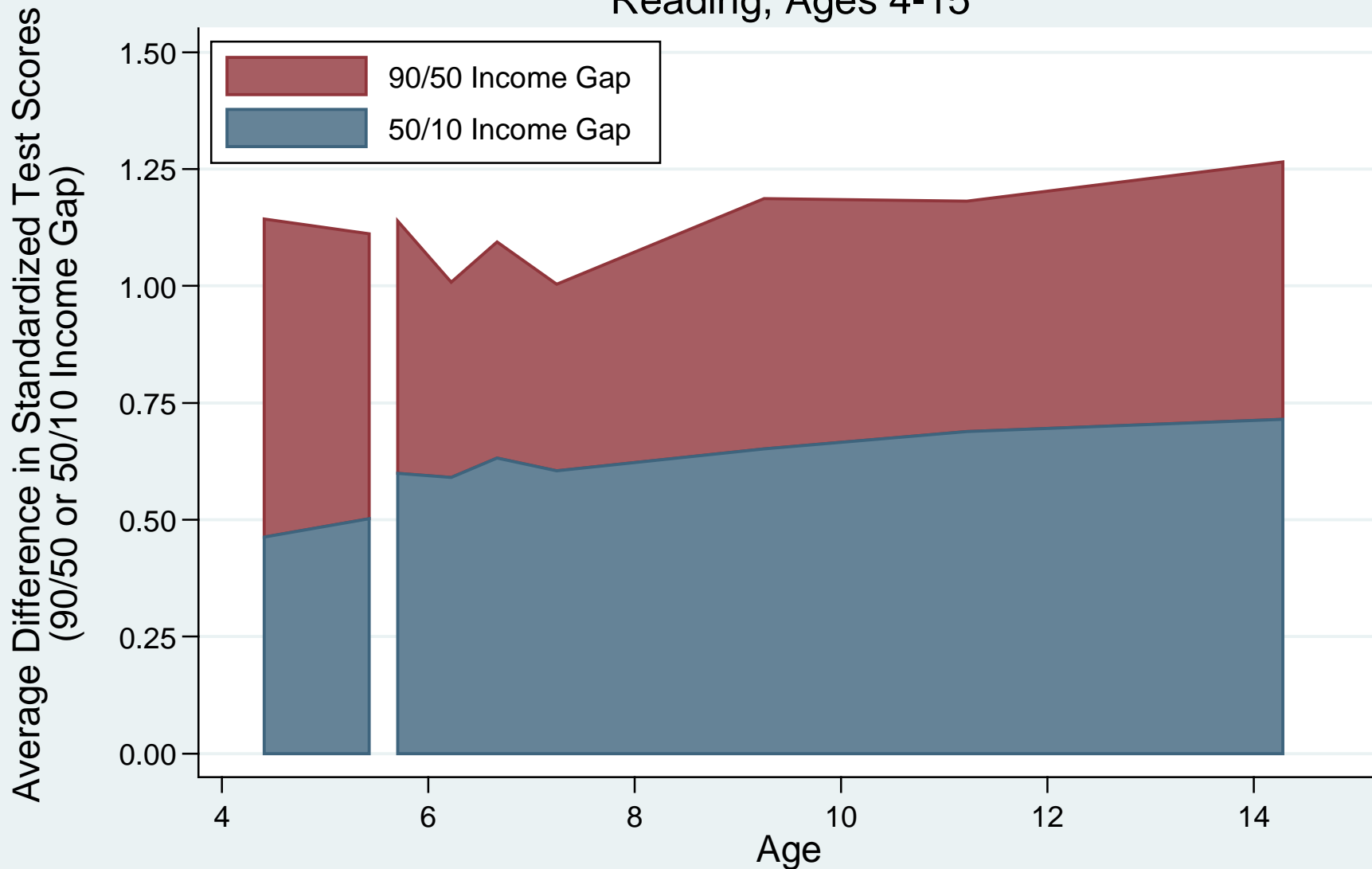
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- College enrollment gap by income has grown as well
- **The income achievement gap is large when children enter school and changes relatively little during K-12**

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



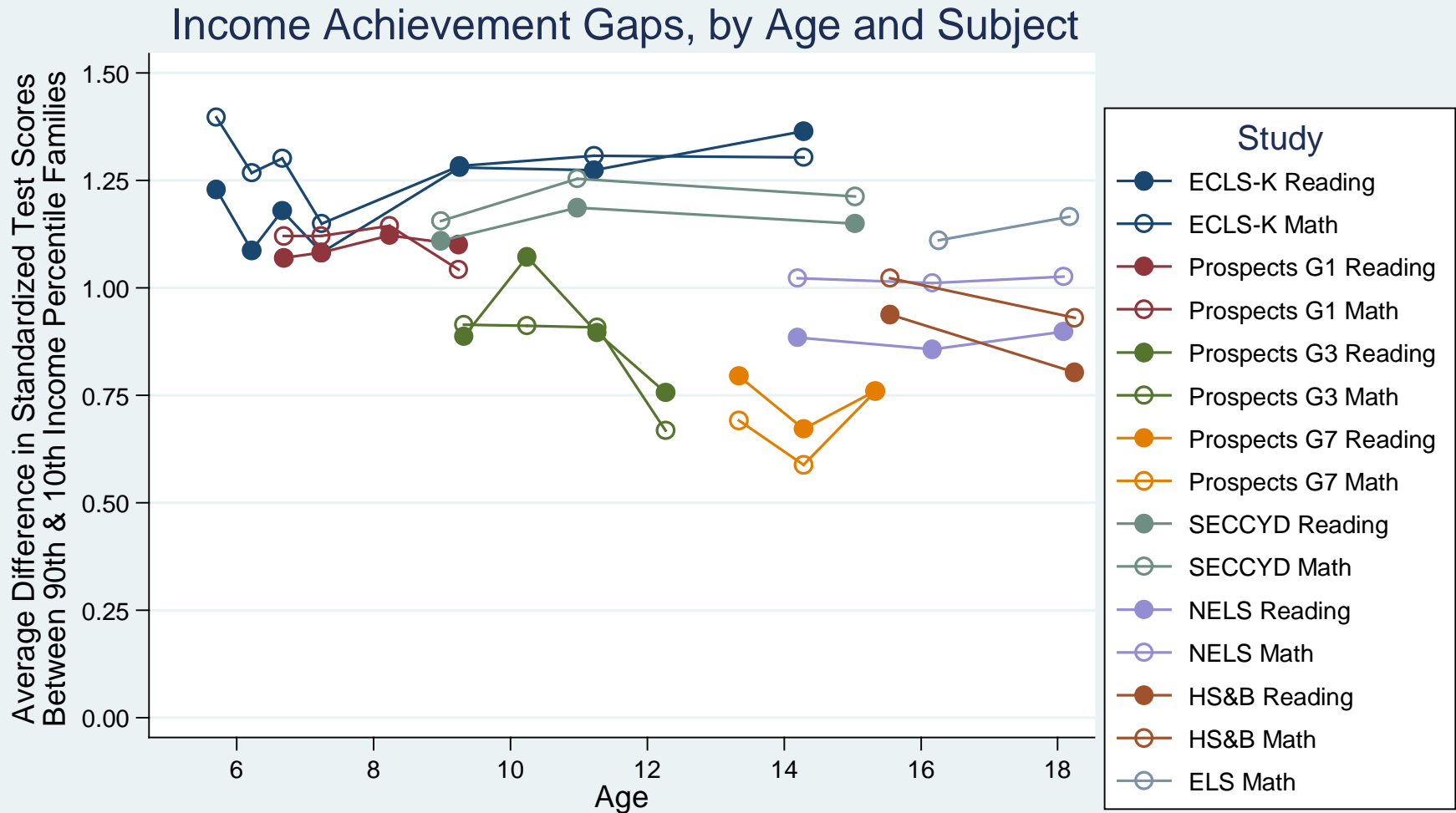
Source: Reardon (2011)

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



Source: Reardon (2011)

development of income achievement gap, by age and subject, all longitudinal studies

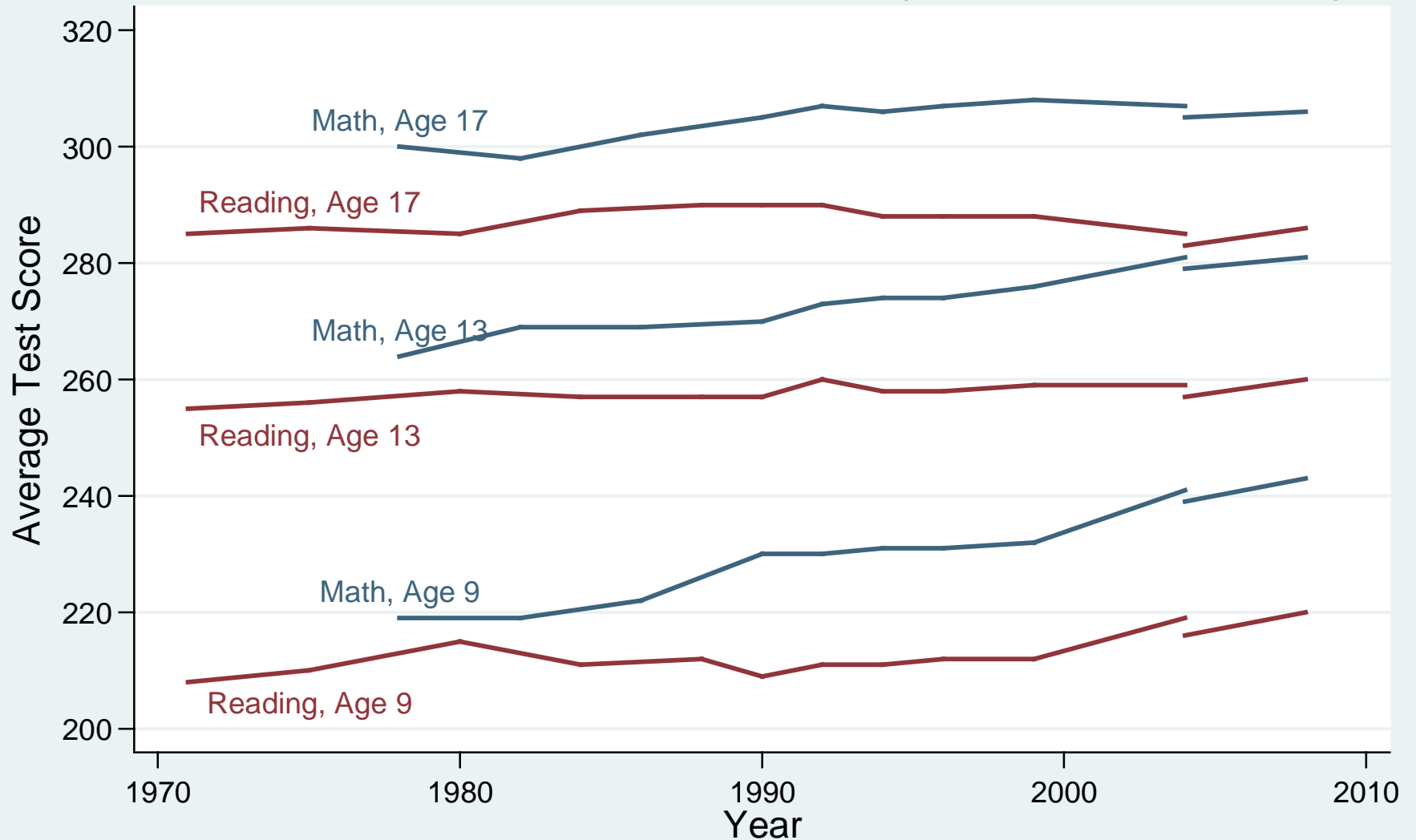


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- **Average achievement has gone up over the last 4 decades**

Trends in Average Reading and Math Scores

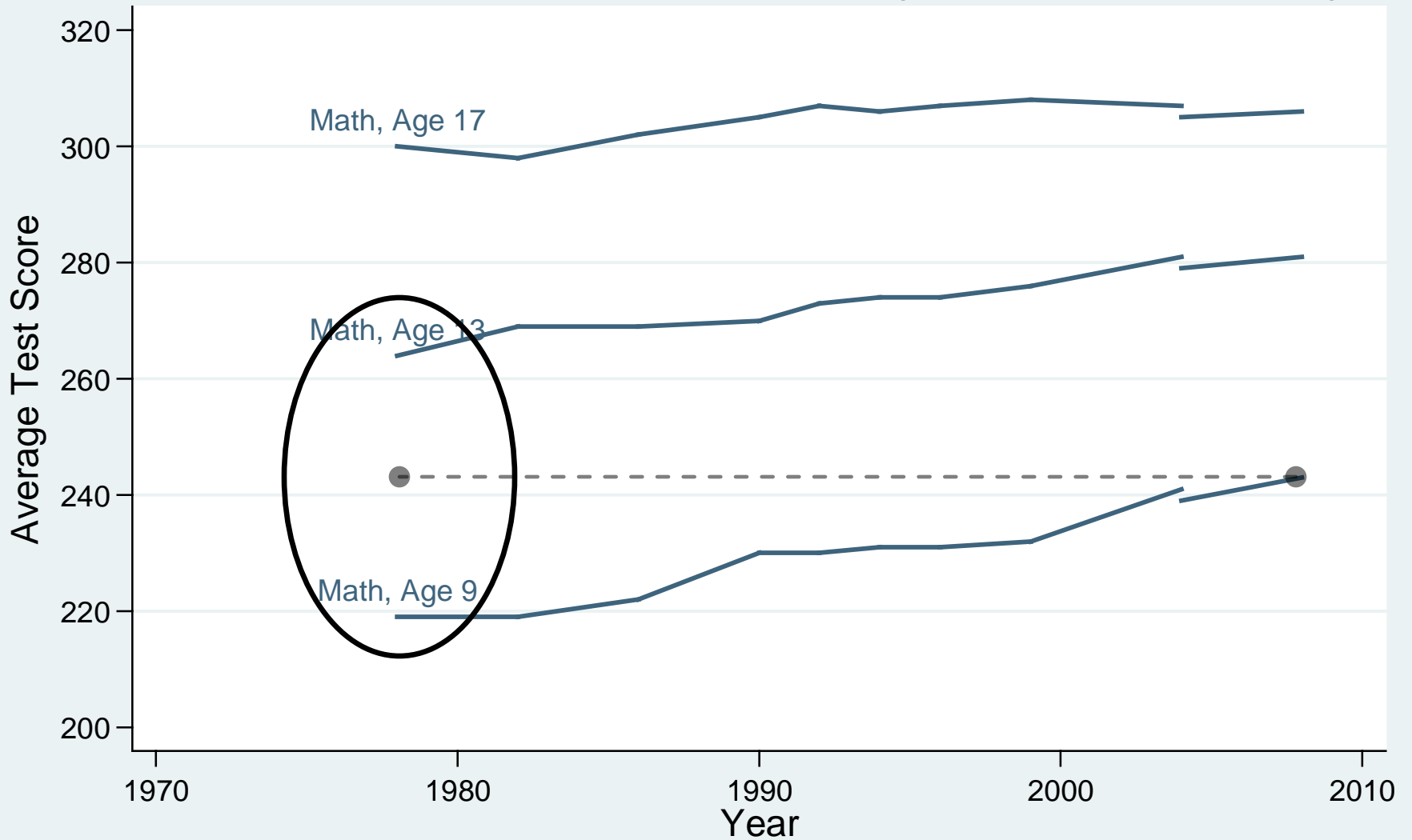
National Assessment of Educational Progress, 1971-2008, By Age



Note: Discontinuity in 2004 reflects change in NAEP test format

Trends in Average Math Scores

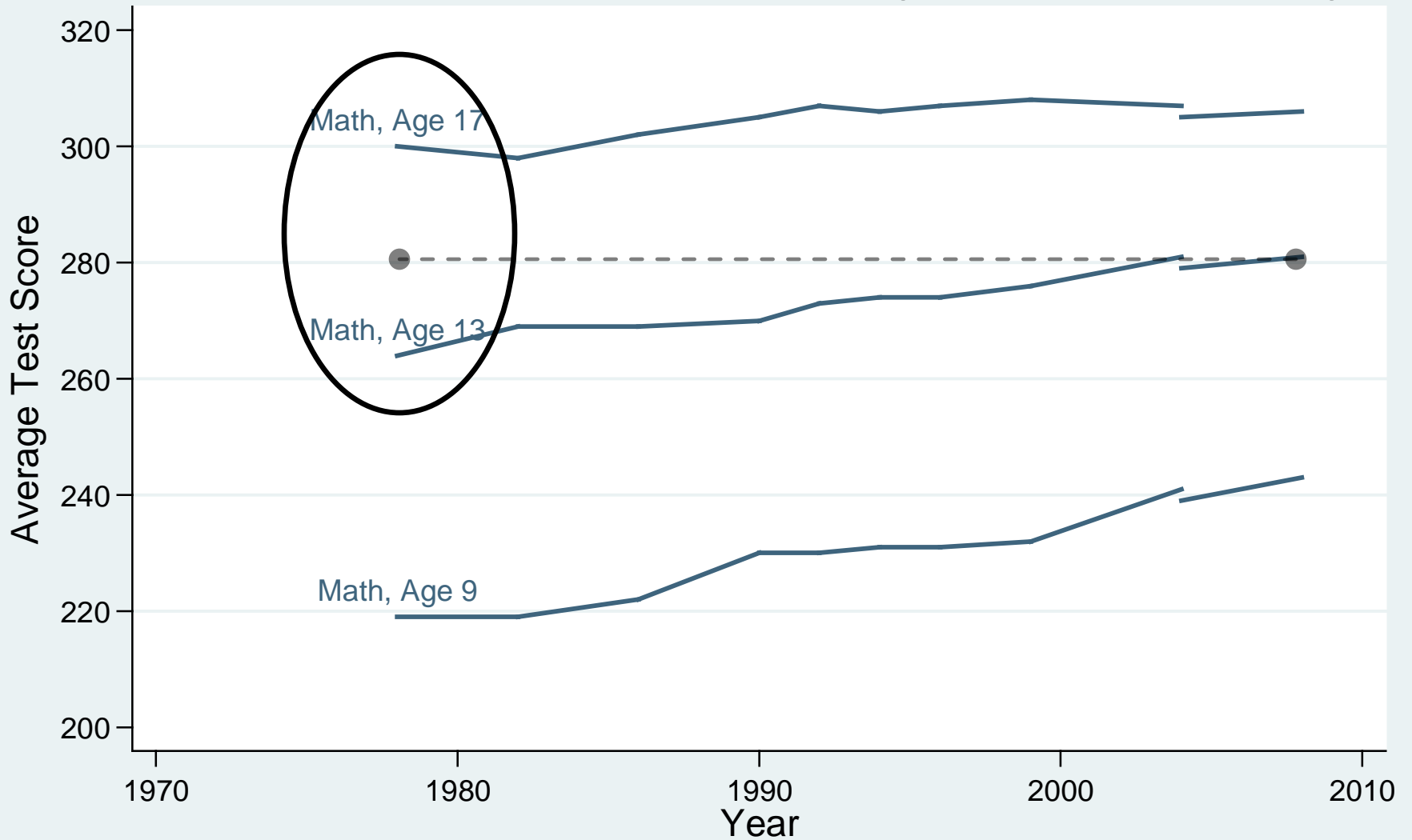
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Trends in Average Math Scores

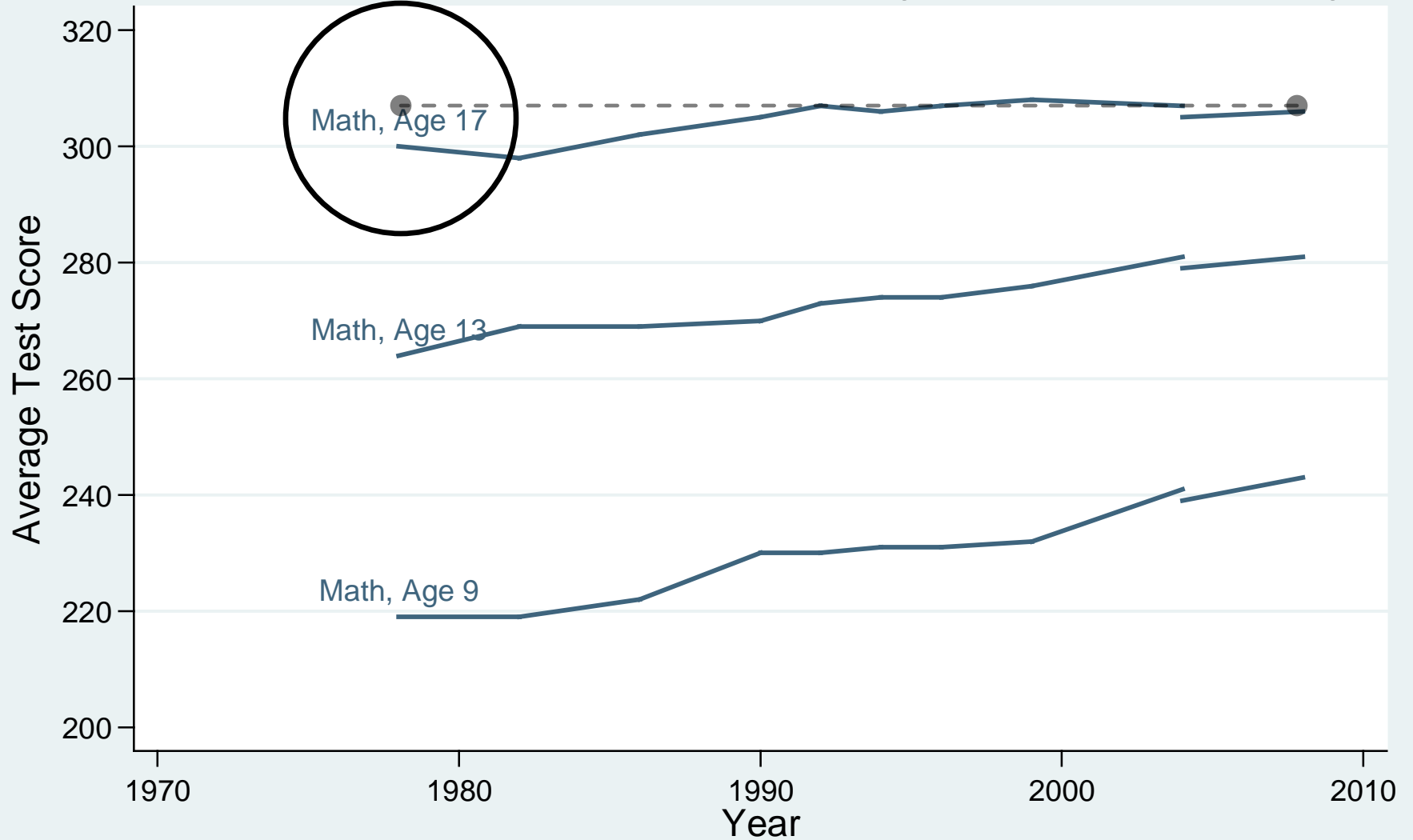
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Trends in Average Math Scores

National Assessment of Educational Progress, 1971-2008, By Age



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Some questions

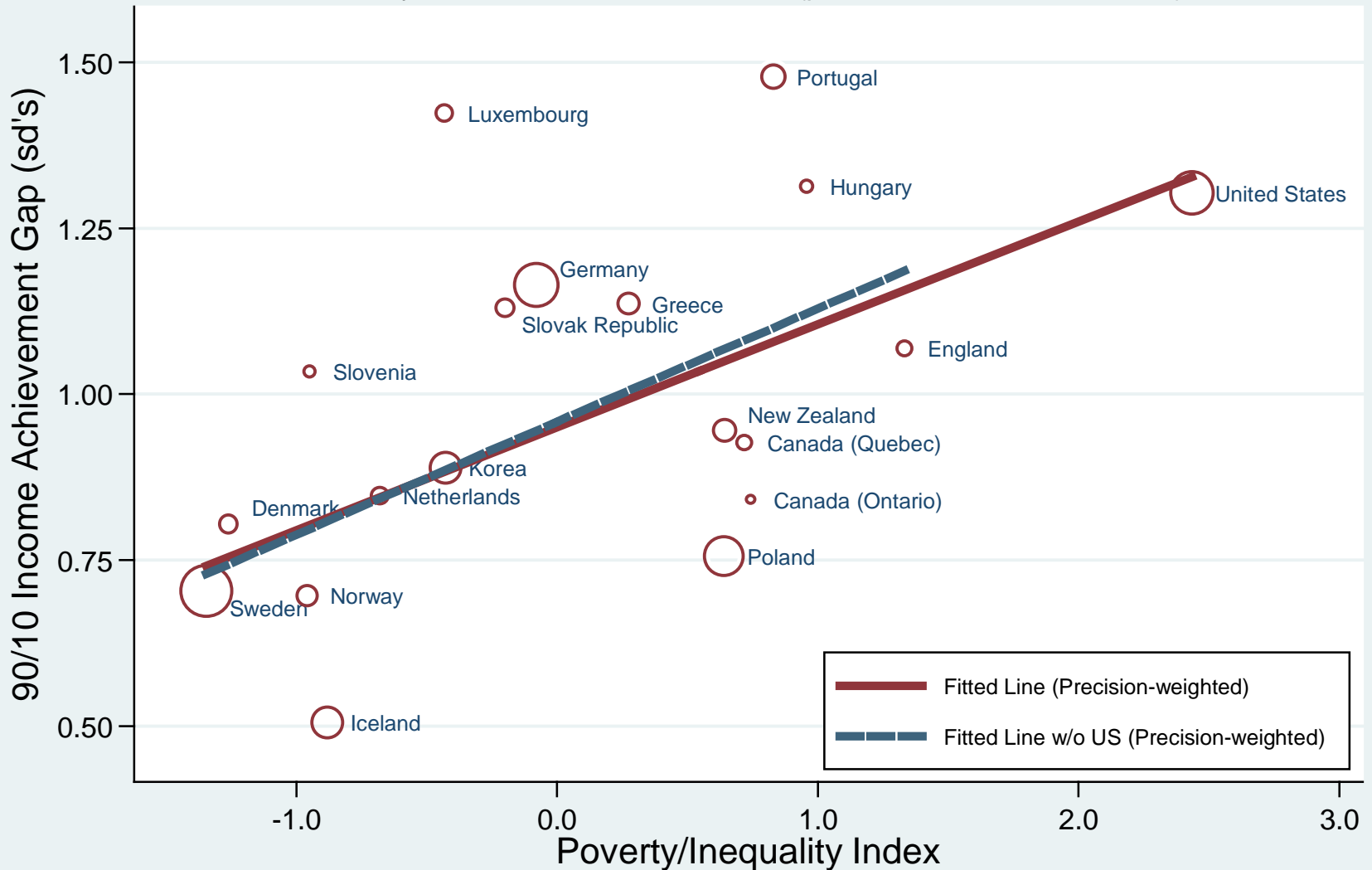
- What is driving these trends?
 - ▣ Inequality (through what mechanisms)?
 - ▣ Parental behavior and investment?
 - ▣ Schooling?
- Are these trends unique to the U.S.?
- Are the same trends evident in other domains than education?
- What are the consequences of these trends (for social mobility, democracy, economy)?
- What should we do about these trends?

Rising inequality and income achievement gaps

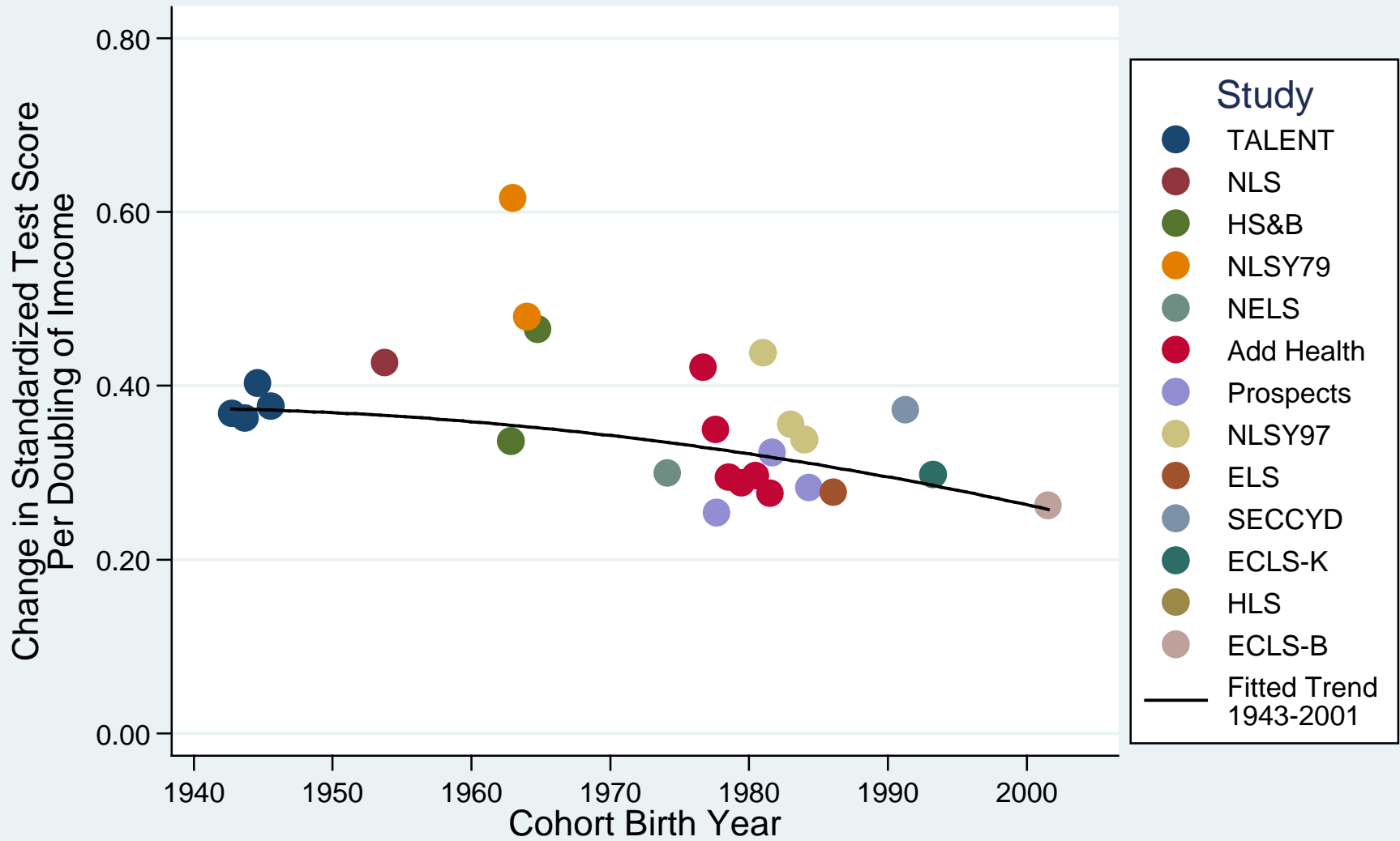
- Is the change in the income achievement gap due to a **mechanical** association between income and achievement?
 - i.e., income directly affects educational outcomes, so wider income dispersion leads to wider dispersion of educational outcomes
- and/or to a change in the **contextual** association between income and achievement?
 - i.e., income inequality leads to stronger association between income and achievement (not only has inequality grown, but money matters more for children's success than it used to)

Association Between Income Achievement Gap and Poverty/Inequality Index

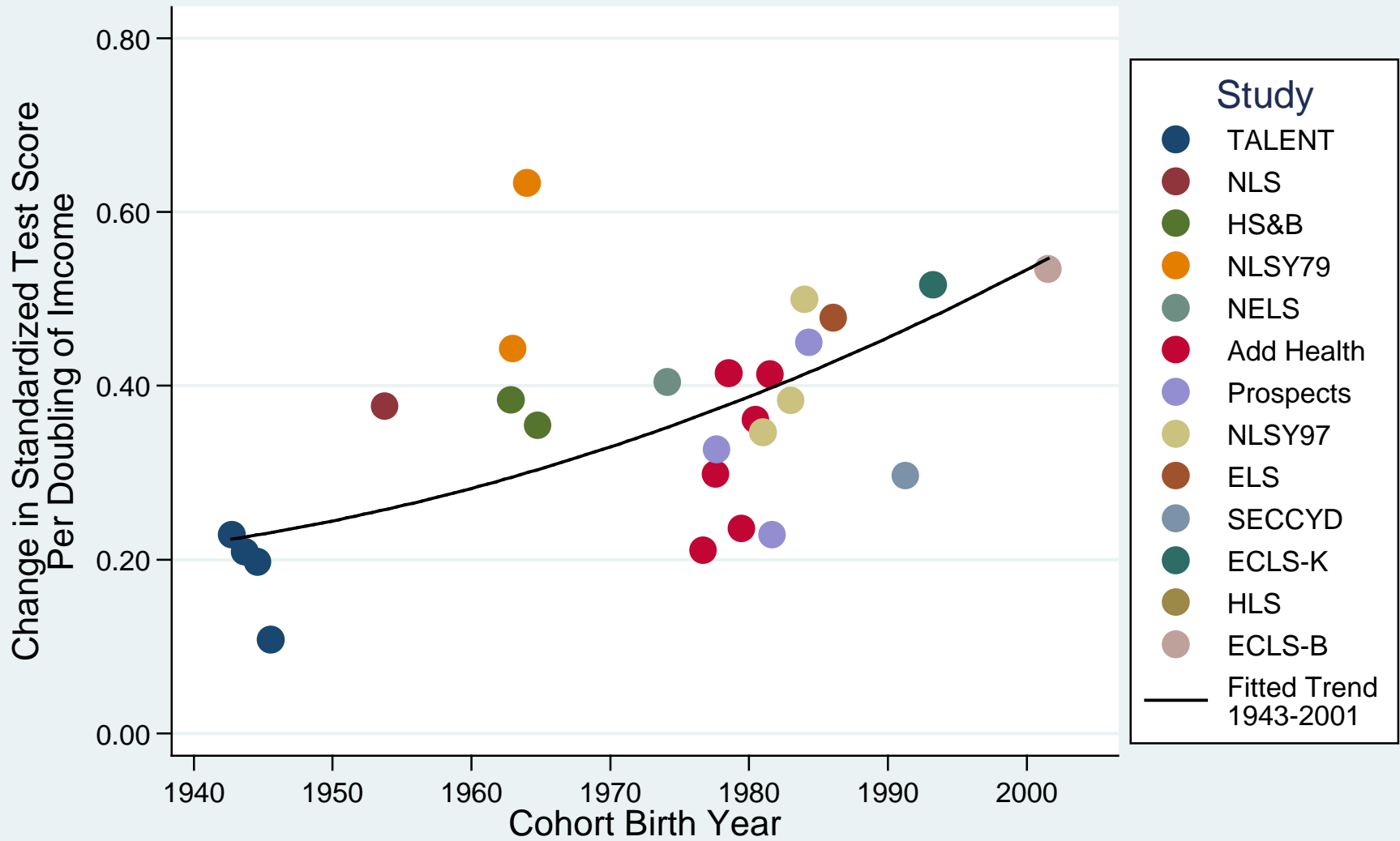
Wealthy OECD Countries, 2001-2009 (pooled PIRLS and PISA data)



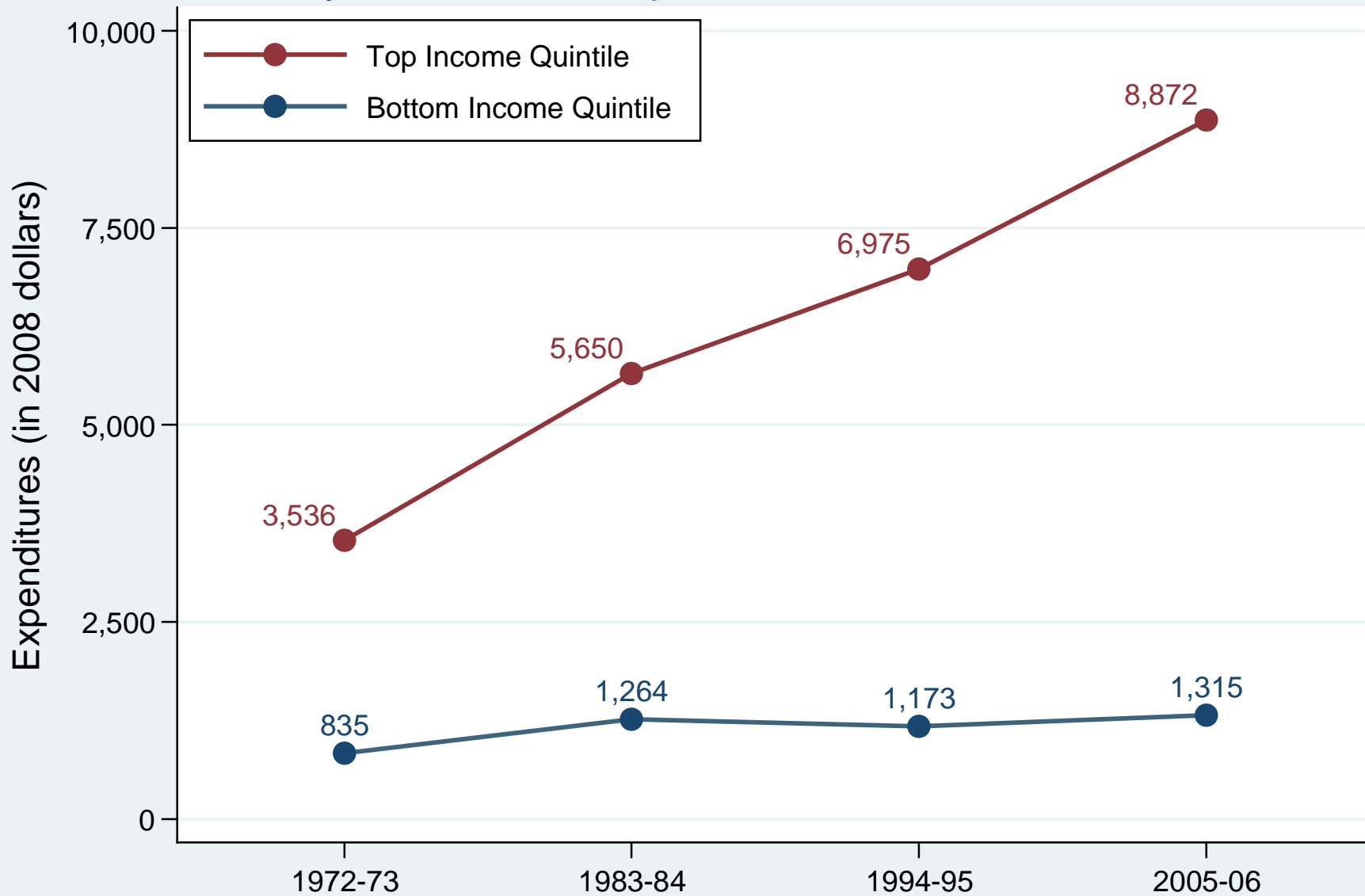
Trend in Association Between Income and Reading Achievement, Families Below Median Income, 1940-2001 Cohorts



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



Family Enrichment Expenditures on Children, 1972-2006



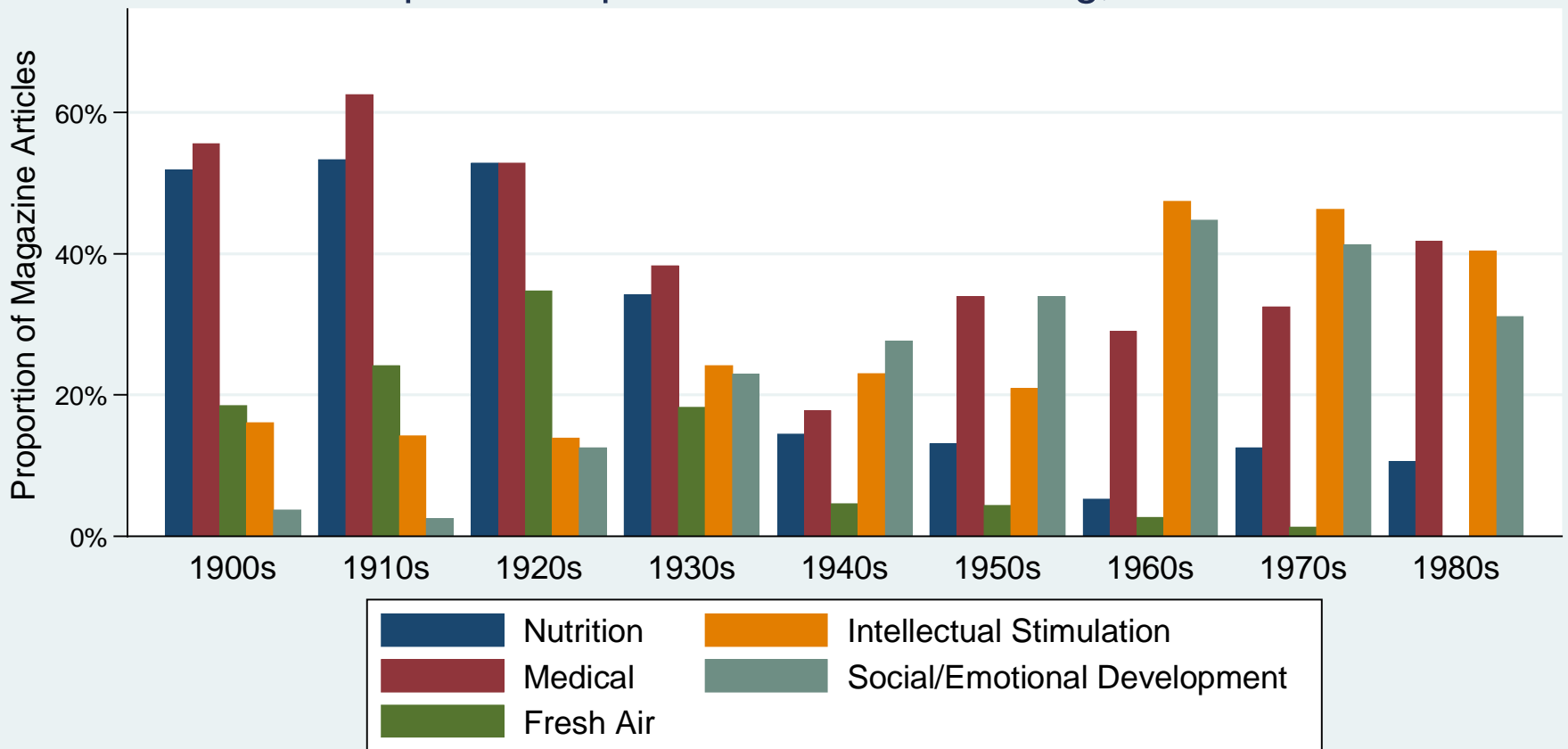
Source: Duncan & Murnane (2011)

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)

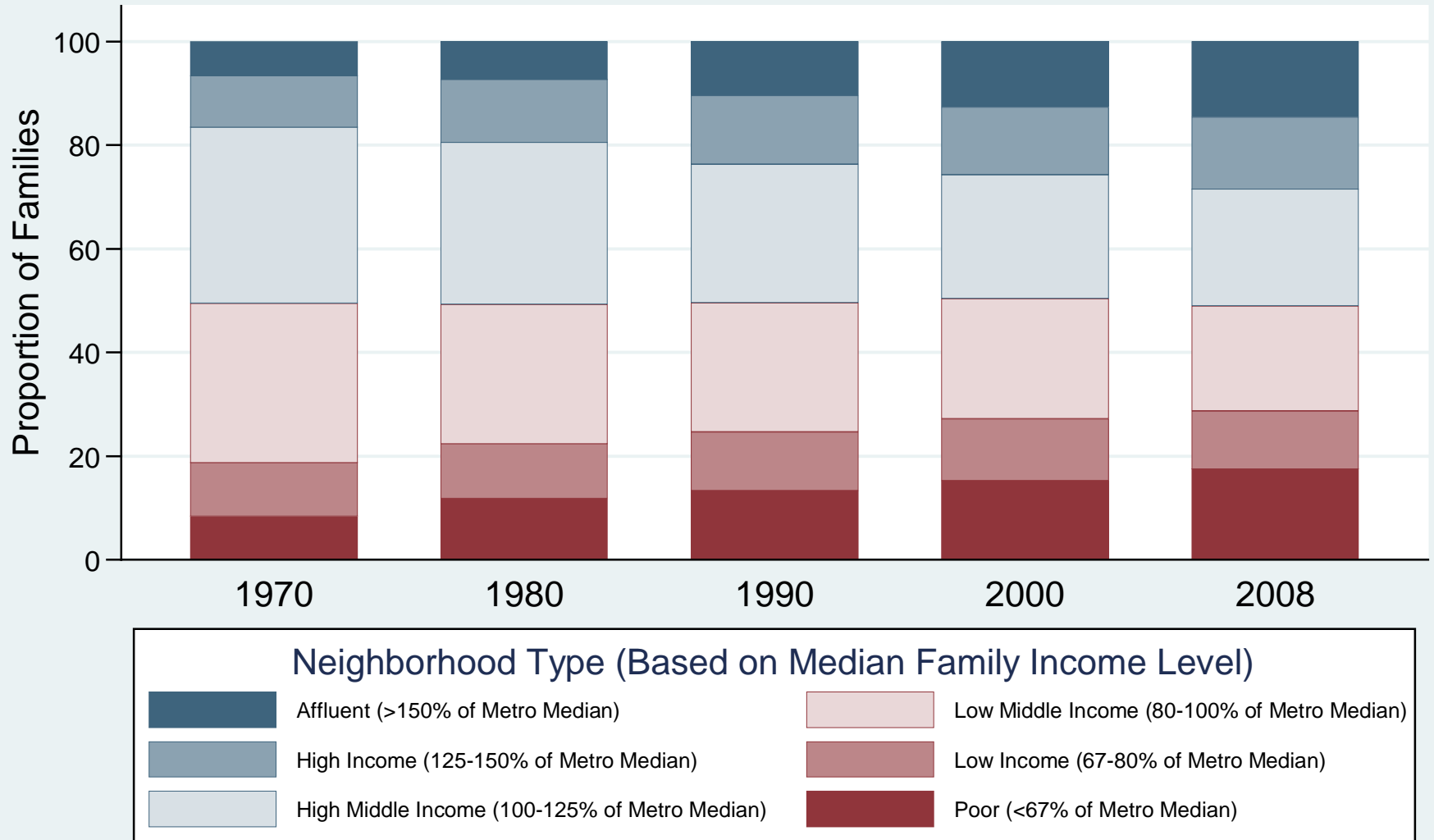
changing views of parenting, 1900-1985 (wrigley, 1989)

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).

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



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)

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 possible explanation

- 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

social 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

- 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