Family Disadvantage and the Gender Gap in Behavioral and Educational Outcomes

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Facts

- The female advantage in high school graduation and college attainment is larger and has risen by substantially more among children of minority families.

- While the overall female advantage in high school completions among US adults ages 20 through 24 was 6.2 percentage points in 2010, it was 4.5 percentage points among whites, 12.2 percentage points among blacks, and 7.8 percentage points among US-born Hispanics.

Motivation

What accounts for the systematically larger gender gaps in educational outcomes among minorities?

One possible explanation, the focus of this paper is gender differences in the effects of family disadvantage.Specifically, we hypothesize that family disadvantage, meaning low availability of household resources, child-rearing inputs (e.g., nutrition, safety in the home, stimuli), and parental attention differentially inhibits the behavioral and academic development of boys relative to girls.

Goals of the Paper

1. To test whether family disadvantage exerts a disproportionate negative effect on the educational and behavioral outcomes of school-age boys relative to girls.

2. To differentiate this hypothesis both from a "fetal origins" alternative as well as from a neighborhood-and-school-quality explanation.

Two Obstacles

1. Data availability

2. Family environment is intrinsically confounded with congenital, hereditary, and other environmental factors that likely affect childrens outcomes independent of the impact of family environment

Literature Review

- Bertrand and Pan (2013,*AEJ*) Boys raised in single-parent families exhibit twice the rate of behavioral and disciplinary issues as boys raised in two-parent families and are more than twice as likely to be suspended from school by the eighth grade.

- Fan, Fang, and Markussen (2015) They hypothesize that rising female employment may in part explain the reversal of the male-favorable gap in educational attainment.

Literature Review

- Chetty and Hendren (2018) Early childhood exposure to low or high quality neighborhoods affects labor force participation, earnings, and education in adulthood.
- Chetty et al (2016,*AER*) The bulk of the SES gradient in the gender gap remains even while schools and neighborhoods also have independent differential effects by gender.

Identification

Our empirical approach contrasts the outcomes of boys and girls across more versus less advantaged family settings

1. Gender gap in potential outcomes among boys and girls is uncorrelated with our measures of family environment at the time of birth
   - Any intrinsic genetic or biological advantage that girls may possess at birth relative to boys is not systematically larger or smaller in less relative to more disadvantaged families
2. Boys and girls are (on average) exposed to the same family environment
   - This condition could be violated if, for example, family environment is endogenous to the gender of the child, as suggested by Dahl and Moretti (2008, *REStud*)

Data

1. Birth certificates for the state of Florida for years 1992 through 2002.

2. School records from the 1995-1996 through the 2012-2013 school years from Florida Department of Education.

SES Measure

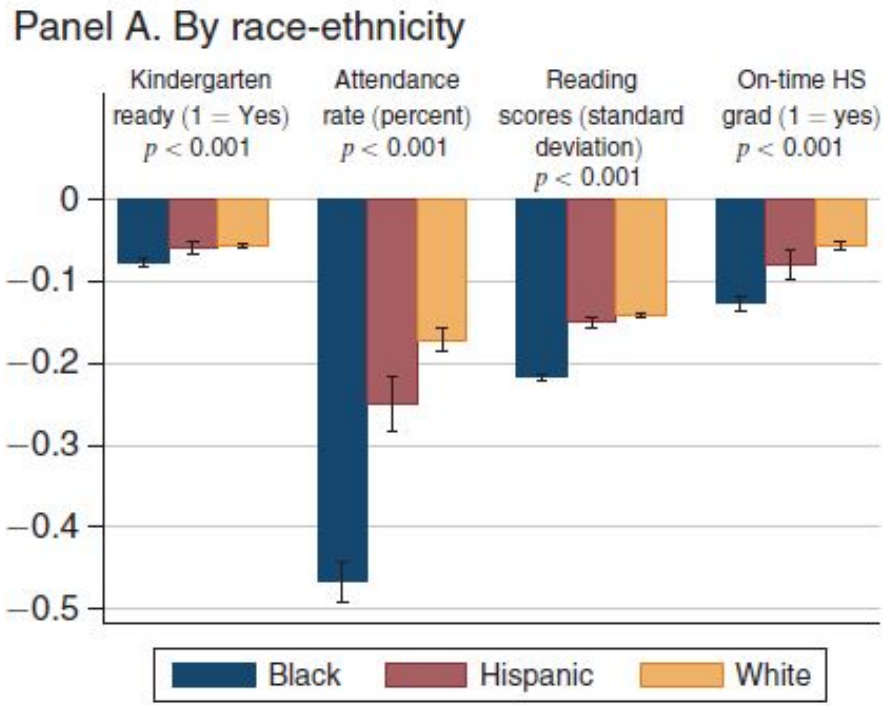
- Using the birth certificate data to create four proxies of family environment: mothers education at birth; mothers age at birth; birth paid by Medicaid, which we use as an indicator of poverty status at the time of birth; and marital status at the time of birth.
- Constructing a single composite SES measure based on a principal components analysis of our four proxies of family environment.

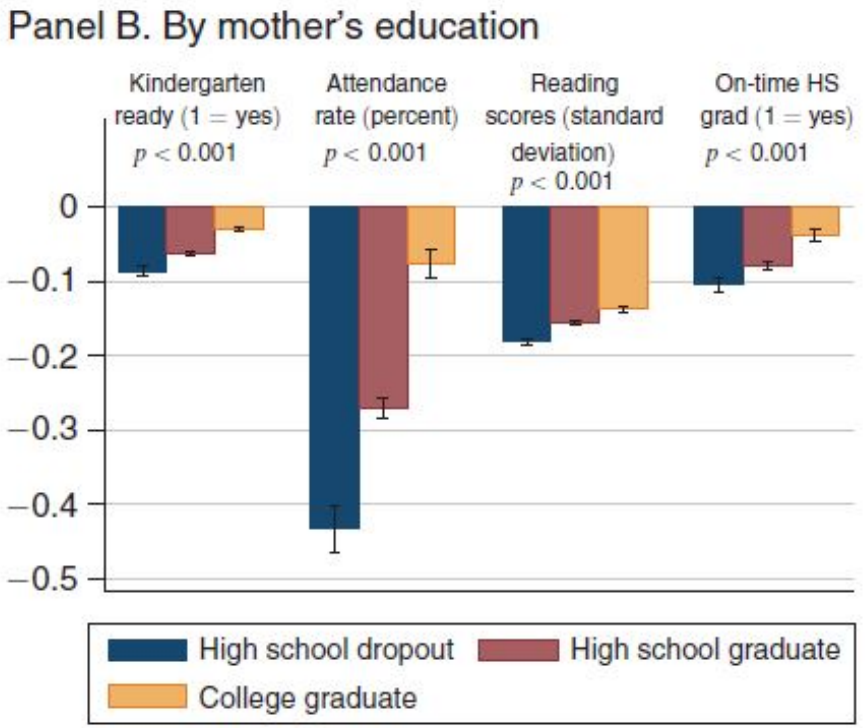
Other Measures

- School quality measure
- Two proxies for neighborhood quality
  1. Median income of the zip code of residence observed at birth
  2. A measure of the causal effects of place of residence on economic mobility by Florida birth county from Chetty and Hendren(2018)

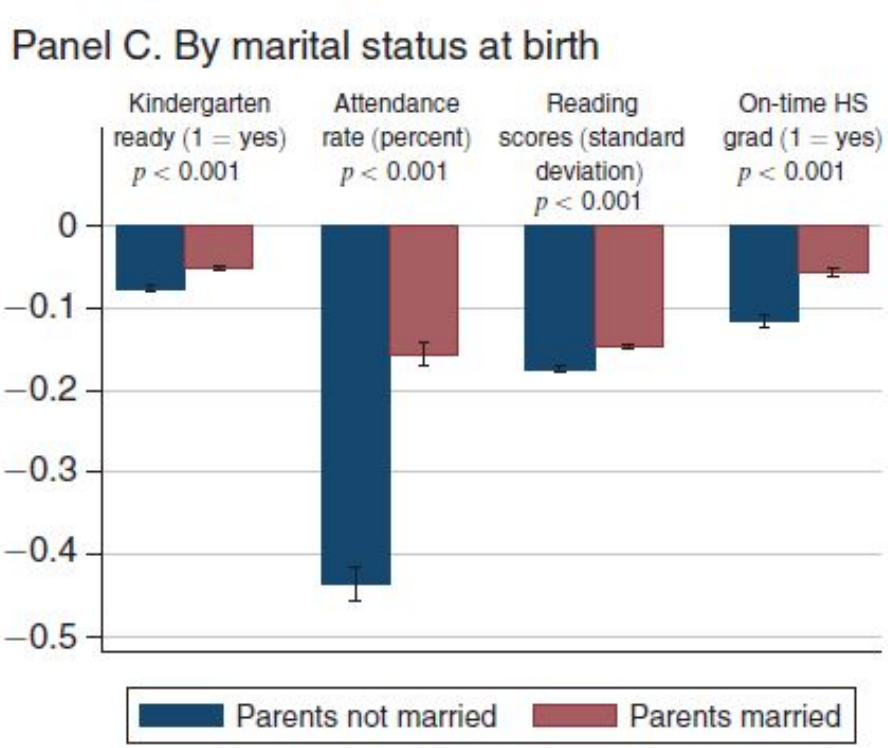
     The Chetty-Hendren mobility measure corresponds to the estimated percentage gain (or loss) in income at age 26 from spending one more year of childhood in each county in the United States.

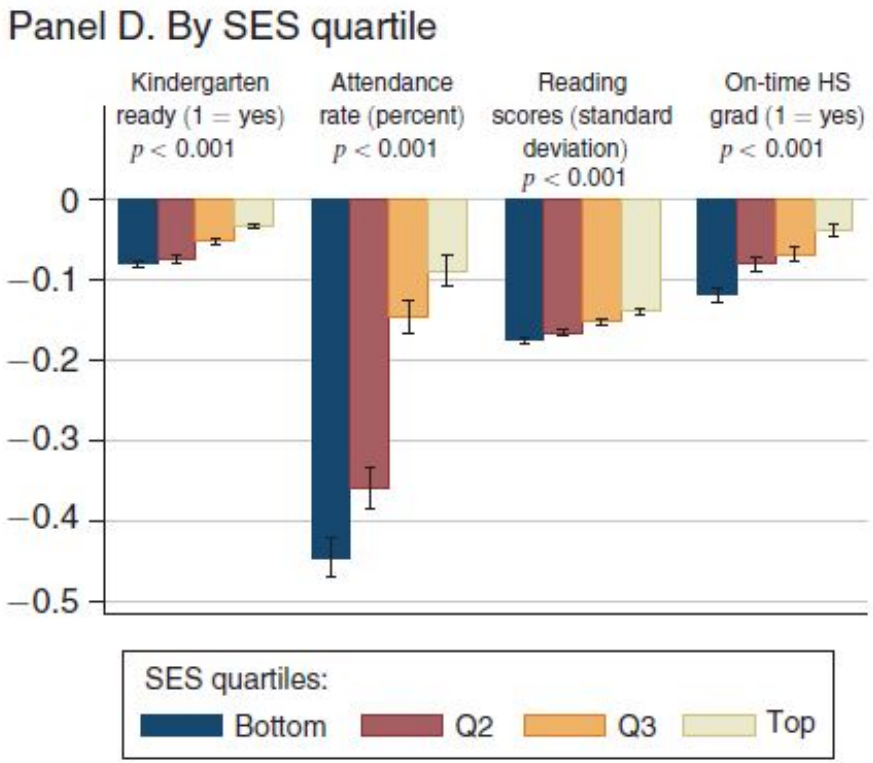
Boy-Girl Gaps by Family Characteristics





Boy-Girl Gaps by Family Characteristics





Regression

We estimate the following regression

$$\begin{aligned} Y_i =& \alpha + \beta_1' Boy_i + \beta_2' (Boy_i \times Black_i) + \beta_3' (Boy_i \times \text{Hispanic}_i) \\ &+ \beta_4' (\text{Boy}_i \times D_i) + \mathbf{X}_{1,i}' \lambda_1' + \mathbf{X}_{2,j(i)}' \lambda_2' + e_i \end{aligned}$$

- The vector $\mathbf{X}_{1,i}'$ controls for time-invariant child attributes, including birth order and month and year of birth.
- The vector $\mathbf{X}_{2,j(i)}'$ controls for the main effects of maternal and family environment characteristics.

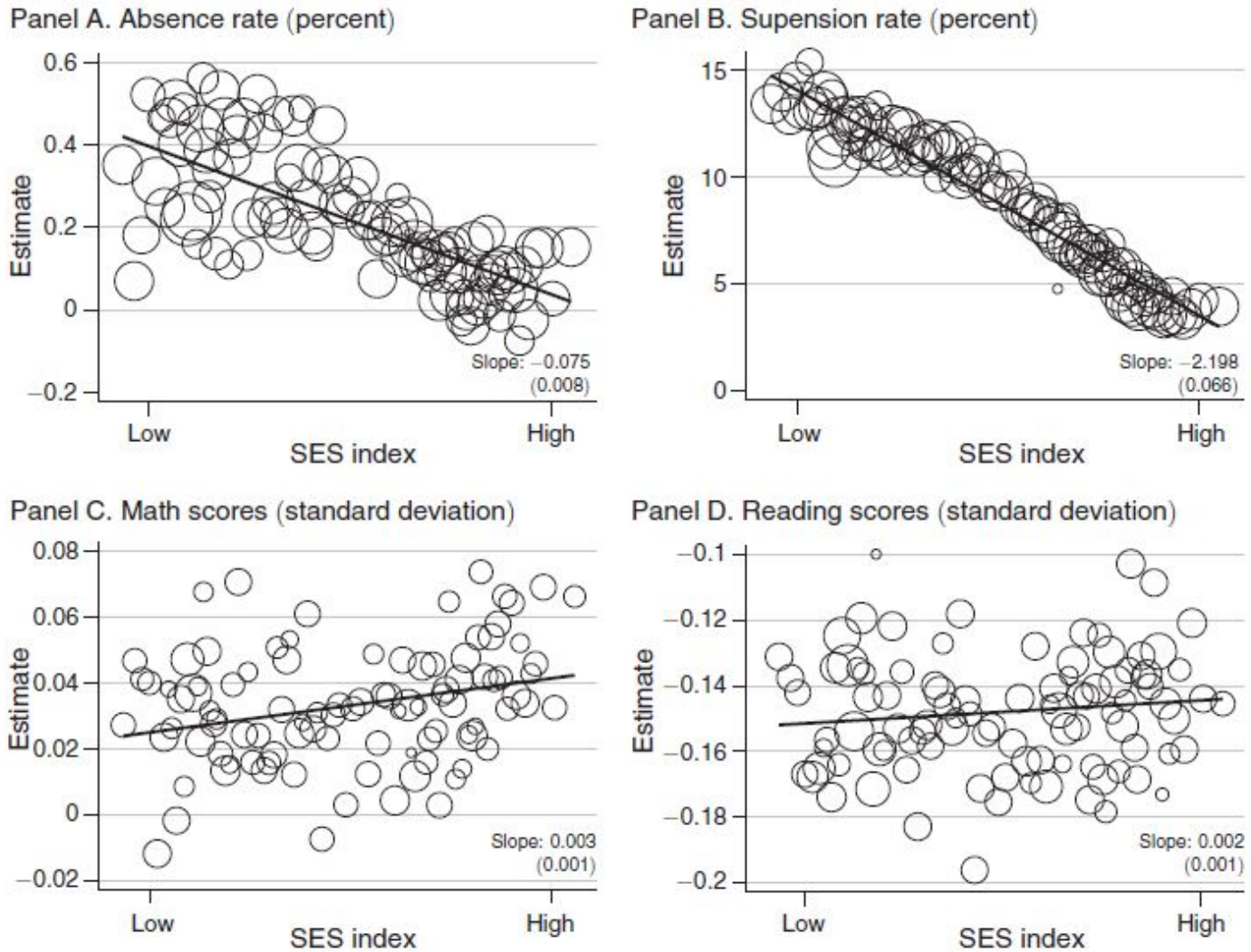
Family Disadvantage and the Gender Gap in Behavioral Outcomes

	Panel A. Absence rate (percent)				*Panel B. Suspension rate (percent)*			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Boy × Mother years of education		−0.02				−0.75		
		(0.01)				(0.03)		
Boy × Married		−0.12				−1.28		
		(0.03)				(0.13)		
Boy × Non-Medicaid birth		−0.19				−3.41		
		(0.03)				(0.13)		
Boy × Mother age at birth		0.01				−0.03		
		(0.00)				(0.01)		
Boy × SES index			−0.07	−0.08			−2.17	−2.40
			(0.01)	(0.01)			(0.03)	(0.07)
Boy	0.19	0.43	0.21	0.24	8.07	21.75	8.58	7.81
	(0.01)	(0.07)	(0.01)	(0.02)	(0.05)	(0.33)	(0.05)	(0.12)
Boy × Black	0.27	0.15	0.17	0.20	4.50	1.67	1.48	2.31
	(0.02)	(0.03)	(0.03)	(0.04)	(0.13)	(0.15)	(0.14)	(0.30)
Boy × Hispanic	0.07	0.03	0.03	0.08	−0.46	−1.73	−1.80	−1.61
	(0.03)	(0.03)	(0.03)	(0.04)	(0.14)	(0.14)	(0.14)	(0.30)
Sibling fixed effects	No	No	No	Yes	No	No	No	Yes
Mean of Y		5.11		4.89		12.82		12.37
Number of children		792,729		301,128		792,729		301,128

Family Disadvantage and the Gender Gap in Academic Outcomes

	Panel A. Mathematics scores (standard deviation)				*Panel B. Reading scores (standard deviation)*			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Boy × Mother years of education		0.005				0.004		
		(0.001)				(0.001)		
Boy × Married		−0.009				−0.001		
		(0.005)				(0.005)		
Boy × Non-Medicaid birth		0.013				0.012		
		(0.005)				(0.005)		
Boy × Mother age at birth		−0.001				−0.002		
		(0.000)				(0.000)		
Boy × SES index			0.005	0.007			0.002	0.005
			(0.001)	(0.003)			(0.001)	(0.002)
Boy	0.034	−0.013	0.033	0.054	−0.147	−0.163	−0.148	−0.121
	(0.002)	(0.013)	(0.002)	(0.004)	(0.002)	(0.012)	(0.002)	(0.004)
Boy × Black	−0.119	−0.116	−0.112	−0.120	−0.070	−0.068	−0.067	−0.078
	(0.004)	(0.005)	(0.005)	(0.009)	(0.004)	(0.005)	(0.004)	(0.009)
Boy × Hispanic	−0.025	−0.023	−0.023	−0.028	−0.009	−0.008	−0.007	−0.002
	(0.006)	(0.006)	(0.006)	(0.011)	(0.006)	(0.006)	(0.006)	(0.011)
Sibling fixed effects	No	No	No	Yes	No	No	No	Yes
Mean of Y		0.060		0.054		0.080		0.042
Number of children		785,664		297,907		785,673		297,938

Boy-Girl Gap in Behavioral and Academic Outcomes by Family SES at Birth



Family Disadvantage and the Gender Gap in High School Graduation

	Panel A. On-time high school graduation		*Panel B. 5+ years of high school*		*Panel C. High school dropout*	
	(1)	(2)	(1)	(2)	(1)	(2)
Boy × SES index		1.46		−0.82		−0.64
		(0.18)		(0.14)		(0.16)
Boy	−6.04	−6.45	3.92	4.15	2.12	2.30
	(0.26)	(0.27)	(0.18)	(0.19)	(0.22)	(0.23)
Boy × Black	−6.72	−4.98	2.98	1.99	3.75	2.99
	(0.53)	(0.58)	(0.43)	(0.47)	(0.43)	(0.47)
Boy × Hispanic	−2.10	−1.29	0.34	−0.11	1.75	1.40
	(0.91)	(0.91)	(0.69)	(0.69)	(0.76)	(0.77)
Mean of Y	70.42		12.75		16.83	
Number of children	161,537		161,537		161,537	

Exploring Mechanisms: Schools and Neighborhoods

- Family disadvantage may amplify the female-favorable gap in childhood outcomes not exclusively because boys are differentially affected by family environment, but also because the neighborhoods and schools in which disadvantaged children are raised are particularly adverse for boys.
- Boys may be more vulnerable to the risks of violence and gang activity in low-SES neighborhoods and schools, or boys may be treated more harshly by authority figures in these settings, perhaps facing greater disciplinary and criminal sanctions from teachers and police.

Determinants of the Gender Gap in Behavioral Outcomes

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Absence rate (percent)						
Boy × SES index		−0.063	−0.058	−0.063	−0.049	−0.048
		(0.007)	(0.007)	(0.007)	(0.007)	(0.008)
Boy × Income in US $10,000			−0.018			−0.007
			(0.008)			(0.008)
Boy × Mobility				−0.022		−0.056
				(0.050)		(0.051)
Boy × School quality					−0.004	−0.004
					(0.001)	(0.001)
Boy	0.173	0.188	0.271	0.182	0.395	0.407
	(0.012)	(0.013)	(0.039)	(0.017)	(0.040)	(0.048)
Boy × Black	0.238	0.150	0.138	0.149	0.122	0.117
	(0.024)	(0.026)	(0.026)	(0.026)	(0.026)	(0.027)
Boy × Hispanic	0.064	0.025	0.022	0.024	0.028	0.025
	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)
Mean of Y				5.083		
Number of children				754,399		

Determinants of the Gender Gap in Academic Outcomes

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Mathematics scores (standard deviation)						
Boy × SES index		0.003	0.001	0.003	−0.000	−0.001
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Boy × Income in US $10,000			0.007			0.004
			(0.002)			(0.002)
Boy × Mobility				0.002		0.012
				(0.009)		(0.009)
Boy × School quality					0.001	0.001
					(0.000)	(0.000)
Boy	0.041	0.041	0.010	0.041	−0.007	−0.019
	(0.002)	(0.002)	(0.008)	(0.003)	(0.007)	(0.009)
Boy × Black	−0.115	−0.111	−0.107	−0.111	−0.105	−0.102
	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Boy × Hispanic	−0.026	−0.024	−0.023	−0.024	−0.025	−0.024
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Mean of Y				0.066		
Number of children				753,356		

To Sum Up

- Boys born to disadvantaged families have higher rates of disciplinary problems, lower achievement scores, and fewer high school completions than girls from comparable backgrounds.
- Gender gap among black children is larger than among white children in substantial part because black children are raised in more disadvantaged families.

Thanks for your attention!