

DISCUSSION PAPERS IN ECONOMICS

Learning from One's Community: Neighborhood Effects on Non-Cognitive Skills

Solveig Delabroye
Department of Economics, University of Colorado Boulder

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Abstract

Neighborhoods of residence during youth are known to play an important role in lifetime trajectories, but mechanisms are still poorly understood. In this paper, I quantify the importance of neighborhood in explaining the non-cognitive skills of teenagers and the gender gap in disruptive behavior. Using a selection

I. Introduction

Inequalities of income, wealth and opportunity as well as social mobility have been rising as major topics

expectancy and reduced likelihood of engaging in criminal behavior¹, which makes them a potentially strong mechanism for the influence of neighborhoods on lifetime outcomes. Moreover, past research shows that the formation of non-cognitive skills is done through socialization and depends on strong investments (financially, emotionally and in term of time) during critical windows in infancy and adolescence. These resources are typically provided by parents but programs such as preschool (Heckman et al. 2010) or

II. Data

For information on non-cognitive skills, neighborhood of residence and socio-economic background, I use the Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K). It followed one cohort of children who entered Kindergarten in fall 1998, in both public and private schools, for full-day or part-day programs. The sample of more than 20,000 children was randomly selected by a multistage probability design (stratified sampling of counties, then schools, then children within school) to be

These indicators are derived from the Social Skills Rating Scales, which have been widely used to assess social and behavioral problem in school-aged children (Gresham and Elliott, 1990). They appear to be internally consistent, and to have high validity based on test-retest reliability (Neidell and Walfogel, 2011). Note that since they are composites (average over several 4-

The ECLS-K only provides a census tract of residence for waves up to spring of 3rd grade (2002). I use the census tract recorded in 2002 to link each child to the

Table 2 above presents descriptive statistics on the two measures of neighborhood quality in our sample. In the "minimum" and "maximum" columns, the numbers in parentheses indicate what proportion of children live in a neighborhood for which the values are minimum or maximum.

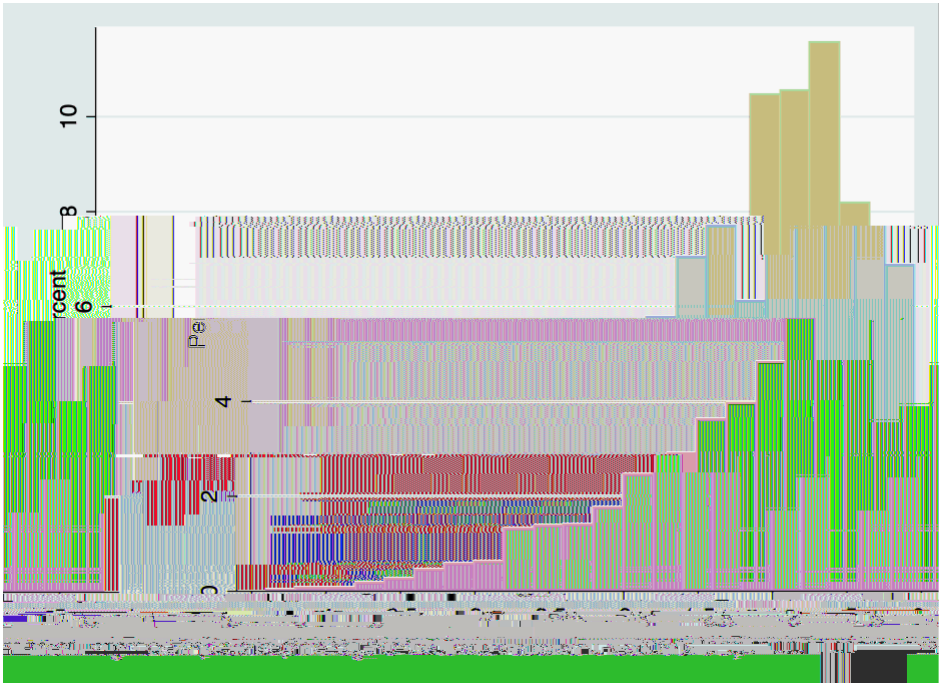
For ease of interpretation in the subsequent analysis, all the key dependent and explanatory variables are standardized, using their mean and standard deviation within the sample for which we have all ECLS-K information *and* rate of father presence at the census tract level (n = 8,272). Going forward, this is considered the sample of reference. To reduce measuring error, I compute z-scores for Self-control and Externalization and take the average of these 2, which I call "Self-Regulation" and is the main outcome variable for my study.

Table 3 below presents the descriptive statistics for the standardized variables. Figure 1 and 2 show the distributions of self-regulation and tract rate of own-race father presence in the sample.

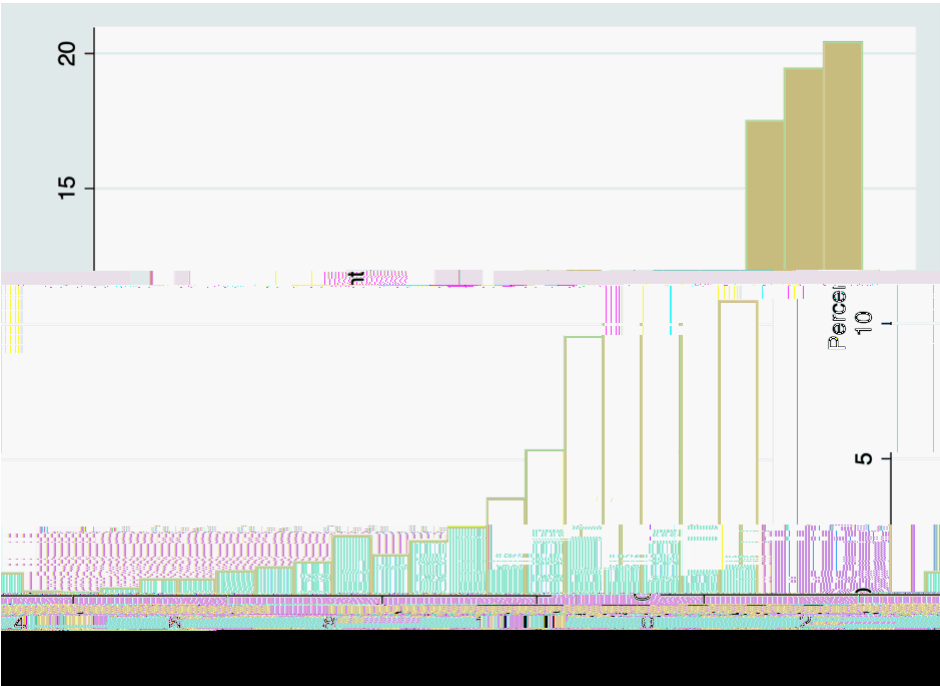
Table 3: Summary statistics of standardized variables (outcome and explanatory)

Variable	Median	Minimum	Maximum	Number of obs.
Externalization (z-score)	0.21	-4.18	1.08	8,272
Self-Control (z-score)	0.12	-3.84	1.26	8,272
Self-Regulation (average of the above 2)	0.23	-3.72	1.17	8,272
Neighborhood rate of father presence (z)	0.26	-4.67	1.12	8,272

Figure 1: Distribution of Self-Regulation



**Figure 2:
Distribution of rate of families of own race in census tract of residence who have a father present**



mental retardation (0.3%), autism (0.1%), blindness, deafness, orthopedic or physical impairment, traumatic brain injury, multiple impairments, developmental delay).

Parent mental health controls: a dummy for whether "During the past 12 months, [any of the parents] have felt or anyone has suggested that [any of the parents] needed professional help for any emotional problem or for drug or alcohol use?" and for whether the parent declined to answer that question; and a caretaker's answers to a depression scale broken into 3 categories: not depressed, depressed and severely depressed.

School-level controls: type of school (neighborhood public school, public school of choice, magnet school, catholic private school, other religious school, other private school, tribal school (on a reservation), special education school, other public school); percentage of pupils testing at or above grade level nationally in reading/verbal and/or mathematics/quantitative skills, dummies controlling non-parametrically for percentage of white pupils; and dummies controlling non-parametrically for percentage of pupils with limited English proficiency.

School-level poverty (only in some specifications): whether the school is eligible for Title I funding (indicating that at least 40% of pupils come from low-

The identification of the parameters of interest relies on variation in non-cognitive skills between children of the same race, age, SES background, family structure and health status attending schools with similar characteristics and whose parents report similar mental health. Endogeneity is a problem if even conditional on this rich set of observable characteristics, there are some unobservable characteristics that are correlated with neighborhood levels of family disruption and also affect children's non-cognitive skills. One such unobservable characteristic might be children's motivation, ability or valuation of education.

If families whose children are more academically promising or well-behaved than other children of their own race, age, SES, family structure, etc. systematically chose to live in areas with less family disruption (which are also on average areas with less poverty, unemployment, racial segregation and gang activity) it would bias my results towards finding a positive β_1 ⁶. On the other hand, if parents whose children exhibit tendencies to "problem" behaviors decide to live in "better" neighborhoods than their counterparts, it would bias me away from finding any effects of the neighborhood characteristics. (Parents choosing nicer or safer neighborhoods if they have a girl creates no omitted variable bias, since that would be picked up by coefficients β_1 and β_3). It is plausible that both tendencies exist in parents, which somewhat mitigates concern over bias. However, this bias cannot be ruled out, since applying the Oster methodology shows that even modest levels of selection on unobservable relative to the existing selection on observables would confound the results.

IV. Results

Table 4 presents my main specifications. The first column only includes the neighborhood rate of father presence and basic demographic controls. It indicates that a

Table 4:
Effect of Rates of Father Presence in Census Tract and Absence of Own Father on Self-Regulation

	Outcome: Self-regulation (z-score)				
	(1)	(2)	(3)	(4)	(5)
Rate of own-race fathers present in tract (z-score)	0.067*** (0.014)	0.031** (0.014)	0.030** (0.014)	0.028** (0.014)	0.023* (0.014)
Girl	0.435*** (0.019)	0.424*** (0.019)	0.424*** (0.019)	0.424*** (0.019)	0.423*** (0.019)
Single mother (own father absent)		-0.067** (0.029)	-0.050* (0.029)	-0.047 (0.029)	-0.051* (0.029)
Biological mother teenager at first birth		-0.143*** (0.031)	-0.138*** (0.031)	-0.141*** (0.031)	-0.138*** (0.031)
Siblings (dummy)		0.116*** (0.030)	0.116*** (0.030)	0.117*** (0.030)	0.112*** (0.030)
Basic demographic controls	Yes	Yes	Yes	Yes	Yes
Family structure and SES !	No!	Yes!	Yes!	Yes!	Yes!
Focal child's health	No	Yes	Yes	Yes	Yes
Parent mental health	No	No	Yes	Yes	Yes
School characteristics	No	No	No	Yes	Yes
School poverty controls	No	No	No	No	Yes
Observations	8,272	8,272	8,272	8,272	8,272
R-squared	0.099	0.142	0.144	0.148	0.150

*** p<0.01, ** p<0.05, * p<0.1. Standard errors clustered by census tract of residence in parentheses (3,200 clusters).

Sample restricted to students present in yave 6 (spring of 5th grade) for whom we have parent questionnaires and non-cognitive measures.

The basic demographic controls include child gender, race and semester of birth.

Other child and family-level controls include immigrant status of mother, single father (dummy), absence of both parents (dummy), quintile of SES index (index including income, parents' education and parents' occupation), mother's education, birthweight in pounds of child and disability status of child.

Parents non-cognitive skills include parents' score on a depression scale and a dummy for parent reporting that (or refusing to answer whether) they need professional help for emotional or substance abuse problems.

School characteristics include school type (charter school, magnet school, catholic school, other private school, other public school), percent of pupils currently enrolled who test at or above grade level nationally in reading and mathematics, percent of pupils currently enrolled who are white, and percent of pupils currently enrolled in 5th grade who have limited English proficiency.

School poverty controls include percent of pupils currently enrolled who are eligible for a free or reduced lunch, and Title 1 status of school.

Column (2) adds family structure and SES as well as controls of the focal child's health and shows that the effect of a 2 standard deviation increase in rates of fathers present in neighborhood (i.e. going from a disadvantaged neighborhood to an average one) is similar in magnitude to going from a single-mother family to a 2-parent family, which is noted in the literature as being an important factor in the development of non-cognitive skills (Bertrand and Pan 2013). The size of these two coefficients remains quite stable as more controls are added. Particularly, column (3), which adds measures of parents' mental health, is almost identical to column (2), except for the fact that the size of the coefficient on living with a single mother decreases quite a bit. This indicates that parents' mental health is correlated with their children's self-regulation skills, and that parents' mental health is on average poorer for single mothers.

Column (4), which includes controls for family structure and SES, child health, caretaker's mental health and school characteristics other than poverty levels, is my preferred specification. It indicates that the effect of a 1 standard deviation increase in rate of father presence in neighborhood is a 0.028 standard deviation

V. Robustness Checks

a. Result in subsamples with additional controls available

Some potential controls of interest are only available for a subset of the sample. Table 6 compares results of the preferred specification in the entire sample with results of that same specification in the subsamples for which we have, respectively, (i) scores for the standardized tests administered during the ECLS-K, (ii) type of location (large or mid-size city, suburb or large town, small town or rural) and (iii) county rate of teenage birth, and specifications in which I add the controls in question.

Column (1) presents baseline results for comparison. Columns (2) and (4) show that restricting the sample to children for whom standardized test scores or type of location (urban, suburb or rural) is available slightly reduces the size and statistical significance of the coefficient of interest, and that adding test scores and type of location to the list of controls (columns 3 and 5) again makes the coefficients slightly smaller and less statistically significant without changing their magnitude much.

subsample: rate of teenage births is only available for 23.65% of the sample children residing in small towns and rural areas, versus 91.90% of sample children residing in large and mid-size cities. The subsample for which teen birth rates are available is much less rural than the full sample (6.8% versus 20.7%). This suggests that my results are bigger and more statistically significant for children residing in cities. This is explored in the next section.

b. Heterogeneous effects of neighborhood quality on self-regulation

In table 7, I run my preferred specification then add test scores and school poverty measures separately for each type of location: Large or mid-size city; Suburb or large town; and small town or rural. It appears that my results are virtually entirely driven by cities, in which the effects of neighborhood quality are almost half again as big as they are in the whole sample. In contrast, the effects of neighborhood quality in suburban

Table 7: Effect of Rates of Father P

c. Excluding students who move between 3rd and 5th grade

Finally, since my measure of neighborhood quality happens in 3rd grade while the non-cognitive skills are measured in 5th grade, it is important to check that the measurement error created by respondents who move between 3rd and 5th grade does not bias my results (I do not observe census tract of residence in 5th grade but students who move between the two waves of the survey are flagged). In table 8, I present the results for the entire sample and for non-movers only side-by-side. They are extremely similar.

Table 8: Excluding respondents who move between 3rd and 5th grade

	Whole sample (1)	Non-movers only (2)
Rate of own-race fathers present in tract (z-score)	0.028** (0.014)	0.034** (0.015)
Single mother (own father absent)	-0.047 (0.029)	-0.035 (0.031)
Biological mother teenager at first birth	-0.141*** (0.031)	-0.134*** (0.033)
Siblings (dummy) !	0.117*** (0.030)	0.124*** (0.032)
All child controls	yes	yes
All parent controls !	yes	yes
School controls	yes	yes
School poverty controls	no	no
Observations	8,272	7,468
R-squared	0.148	0.147

*** p<0.01, ** p<0.05, * p<0.1. Standard errors clustered by census tract of residence in parentheses.

All child controls include child gender, race and semester of birth, single father (dummy), absence of both parents (dummy), birthweight in lbs and disability status.

All parent controls include immigrant status of mother, quintile of SES index (index including income, parents' education and parents' occupation), mother's education, caretaker's score on a depression scale and a dummy for parent reporting that (or refusing to answer whether) they need professional help for emotional or substance abuse problems.

School characteristics include school type (charter school, magnet school, catholic school, other private school, other public school), p

Conclusion

In conclusion, I expose a likely mechanism for recent results in the literature on geography of opportunity in the U.S. For example, Chetty, Hendren and Katz (2016) study the Moving to Opportunity experiment and find that moving to a lower poverty neighborhood (which is very likely to be a lower family disruption neighborhood) before age 13 increases college attendance and earnings and reduces single parenthood rates, while Chetty and Hendren (2015) show that neighborhoods have causal exposure effects on children's outcomes using quasi-experimental methods. I find that a one standard deviation increase in the neighborhood rate of father presence increases self-regulation in 11 years old students by about 0.03 standard deviations, which is about 1/2 the effect of the presence of a child's own father. This implies that children of single mothers who are at risk of youth delinquent behavior or dropping out of high school (both of which have been linked to low non-cognitive skills) might effectively mitigate that risk by moving from neighborhood with high family disruption (father presence rates 1 std below average

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