The Growing Importance of Socioemotional Skills for Academic Achievement in the United States

September 27, 2013

Ozcan Tunalilar[†]
Department of Sociology, University of Florida

Robert G. White
Department of Sociology, University of Florida

Abstract

Evidence that socioemotional skills related to attentiveness and anti-social behavior are closely tied to academic achievement underscores the importance of the broad range of skills required for school success in modern America. Using two birth cohorts born during early 1980s and 1990s, we find that the importance of these skills is a relatively recent phenomenon. We select two cohorts of adolescents from the NLSY97 and the children of the NLSY79 to assess changes in the effects of attentiveness and anti-social behaviors in models of school achievement. We adopt a propensity score weighting procedure to account for changes in the distributions of family background between cohorts and construct cohorts suitable for comparison. The estimated increase in the effect of socioemotional skills for achievement illustrates how these skills present an emerging additional axis for educational inequalities.

[†]Correspondence address: otunalilar@ufl.edu

1 Introduction

Stalled progress in reducing socioeconomic inequalities in educational attainment in the United States raises many questions about the changing requirements for economic mobility. Alongside the continued modest gains in reducing race inequalities in educational attainment, evidence that socioeconomic inequalities in achievement may be increasing (Reardon 2011) underscores the persistent importance of one's socioeconomic background for success in school. Although the large increase in income inequality over the last two decades (Piketty and Saez 2003; Kopczuk et al. 2010) is an important driver to increasing educational inequalities, changing institutional contexts present an ever growing set of pathways for family socioeconomic background to influence children's school success. Far beyond the well-known effects of pre-kindergarten participation (Magnuson et al. 2007; Deming 2009; Ludwig and Miller 2007) and a stimulating home environment (Berger et al 2009; Guo and Harris 2000), the evidence grows for a lift in achievement from after-school activities (Meyers et al. 2004), sports, recreational lessons and enrichment activities (Mahoney et al. 2005; Morris and Kalil 2006; Kaushal et al. 2011).

While establishing the causal effects from the many opportunities that money can buy remains complicated, many of these activities share in common the promotion of a set of skills that have long been closely correlated with academic success. Skills such as attentiveness and the self-regulation of impluses which might otherwise cause disruptions have been closely tied to family socioeconomic status (SES) (Duncan and Magnuson 2011) and widely shown to predict school success and favorable labor market outcomes in adulthood. Separate from measure of attention are behaviors that facilitate relationship building among peers and with authority figures. Difficulties with the same internal processes of self-regulation may also manifest in problematic externalizing behaviors that constrain the development of productive social relationships (Tremblay et al. 2005) such as bullying, cheating and disruptive actions that interfere with established rules for social engagement. We refer to these measures as skills because of their change over time, their correlation

with classroom environments and the current poor understanding of their biological origins. These skills are among a broad set of skills related to schooling success that have long been speculated to play an important role in socioeconomic inequalities in school success (Bowles and Gintis 1977) and which have more recently attributed with an important contribution to intergenerational mobility (Blanden et al. 2007; Duncan et al. 2012).

The effect of socioemotional skills on educational achievement (Duncan and Magnuson 2011; Duncan et al. 2012; McLeod and Kaiser 2004) and the returns to socioemotional skills in the labor market (Heckman et al. 2006) have been well established. For instance, Duncan and colleague found that completed education was positively associated with prosocial behavior and negatively associated with antisocial behavior during adolescence even after controlling for parental SES and other related child characteristics. Using data from the Children of the National Longitudinal Surveys of Youth, McLeod and Kaiser (2004) examine the effects of childhood emotional and behavioral problems on educational attainment. Their findings show that externalizing problems (i.e., antisocial behavior) decreases the chances of receiving a high school degree and college enrollment (given high school graduation).

2 Comparing NLSY Cohorts

We select two cohorts of adolescents from the National Longitudinal Study of Youth 1997 (NLSY97) and the children of the National Longitudinal Study of Youth 1979 (NLSY79) cohort to assess the changing importance of socioemotional skills for school achievement. The advantages of using these two cohorts is the comparability of many of the key measures related to child development and schooling outcomes. We select comparable cohorts from these two studies to examine the changing contribution of socioemotional skills for chilren's academic achievement. A difficulty in selecting two cohorts for comparison from these two studies is the inherent tradeoffs between sample size and the time interval distinguishing the cohorts. To maximize both the sample size and the time period separating

the cohorts, we select children from the NLSY1979 cohort ('79) who were born between 1991 and 1994 (younger cohort) and children from the NLSY97 cohort ('97) who were born between 1982 and 1984.

We estimate ordinary least-square regression models of the Peabody Individual Achievement Test (PIAT) Math normalized percentile scores for specific ages separately for two cohorts and report standardized beta coefficients. This analytical strategy allows us to show the changing effects of socioemotional problems on academic achievement for middle school children. [2] Our socioemotional problems index (SEP) consists of two items for both cohorts: "[Child] cheats or tells lies" and "[Child] is unhappy, sad, or depressed." Although more items are available for both datasets, they were not comparable therefore did not suit our analytical needs in this analysis. For both cohorts, answers were reported by the reporting parent. Both items ranged from 0 (Not True) to 2 (Often True). We constructed the index by summing two items. The range of the scale is five (0-4) and higher values indicate more socioemotional problems. The time of measurement for both cohorts was between ages 12 and 14 and we selected the closest measures (for children who were measured more than once) to the time of measurement for our outcome variable.

Items from the NLS designed Home Environment index (HOME) were selected to construct an index that of emotionally and cognitively enriching resources available to children. Although the wording of specific items for the two cohorts differ, we contend that they are comparable. Items for '79 cohort include the following: "Building has no potentially dangerous structural or health hazards within a school-aged child's range," "All visible rooms of the house/apartment are reasonably clean," "[Child] feels safe walking and playing in the neighborhood," "Do you have a computer at home?" and "whether child has any books." The former two items were reported by the interviewer, the following two was reported by child, and the latter was reported by the mother. For the '97 cohort, we

[2]PIAT Math aims to measure the achievement of mainstream mathematics education. There are 84 multiple-choice items of increasing difficulty, beginning with foundational skills such as numeral recognition and extended to advanced concepts in geometry and trigonometry.

used the following items in a similar manner: "How well kept are most of the buildings on the street where the adult/youth resident lives?" "How well kept is the interior of the home in which the youth respondent lives?" "When you went to the respondent's neighborhood/home, did you feel concerned for your safety?" "In the past month, has your home usually had a quiet place to study?" and "In the past month, has your home usually had a computer?" The former three items were reported by the interviewer and the latter two was reported by the child. For both cohorts, we recoded answers to all questions to indicate No (0) and Yes (1). We constructed the index by summing all the items. Therefore, higher values indicate more enriching environment for the child, ranging from 0 to 5.

3 Preliminary Results

Table 1 reports descriptive statistics for the two cohorts. The '79 cohort is more likely to be female, have higher academic achievement, lower socioemotional problems, and live in better home environment with higher income and fewer siblings. The '79 cohort is also born to older mothers with higher education than the '97 cohort.

Tables 3 and 4 show the standardized coefficient estimates for OLS regressions of PIAT percentile scores on socioemotional and demographic characteristics of the child in addition to socioeconomic and maternal background. Results show that children with higher socioemotional problem scores are more likely to have lower academic achievement regardless of cohort membership. More importantly, the coefficient for the socioemotional score is larger in the younger cohort, providing some evidence that the negative effect of problem behavior on children's achievement might be increasing. Including control variables fully attenuates the effect of socioemotional problems on academic achievement for the older cohort. The persistence of significant socioemotional effects in the full model for the younger '79 cohort is suggestive of the increasing importance of socioemotional skills over the period separating these two cohorts.

4 Propensity Score Reweighting for Cohort Comparisons

Comparing age cohorts with similar measures of socioemotional skills and labor force outcomes provides a direct means for assessing changes in the importance of socioemotional skills. While the NLSY cohorts have many of the necessary measures of family background and child development that are sufficiently comparable, the '79 and '97 cohorts have substantially different distributions of key covariates. We propose to circumvent these incompatabilities between the two cohorts by using propensity score matching. Adopting a propensity score weight to reweight the cohorts allows adjusting each cohort's distributions in order to allow comparisons between the cohorts that are independent of the differences in the distributions of these attributes.

In this case, to assess the consequences of any observable changes in key attributes, comparisons may be made between the cohorts by reweighting the older cohort to reflect the distributions of key attributes of the younger cohort. Given a set of covariates of interest that are thought to predict adult labor force outcomes, the older cohort sample may be reweighted to reproduce the same distributions of the selected covariates as observed in the younger cohort. Comparing the outcomes of interest between the original and this reweighted sample of the older cohort then provides a means for assessing the consequences of any change in covariates occurring between the two cohorts. This comparison does not require any parametric assumption about these relationships. This method is an adaptation of the decomposition procedure originally proposed by (DiNardo et al. 1996) (hereafter, DFL) and applied by Altonji et al. (2012) to decompose the changes in wage distributions between the NLSY 1979 and 1997 cohorts implied by the changes in individual skills occurring between these two cohorts.

References

Altonji, Joseph G., Bharadwaj, and Fabian Lange. 2012. "Changes in the Characteristics of American Youth: Implications for Adult Outcomes." *Journal of Labor Economics* 30:783–828.

Blanden, Jo, Paul Gregg, and Lindsey Macmillan. 2007. "Accounting for Intergenerational Income Persistence: Noncognitive Skills, Ability and Education." *Economic Journal* 117:C43–C60.

Bowles, Samuel and Herbert Gintis. 1977. *Schooling in Capitalist America: Educational Reform and the Contradictions of Economic Life*. Basic Books.

DiNardo, John, Nicole Fortin, and Thomas Lemieux. 1996. "Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach." *Econometrica* 64:1001–1044.

Duncan, Greg and Katherine Magnuson. 2011. "The Nature and Impact of Early Achievement Skills, Attention Skills and Behavior Problems." In *Whither Opportunity? Rising Inequality, Schools, and Children's Life Chances.*, edited by Greg Duncan and Richard Murnane, pp. 47–69. New York: Russell Sage Foundation.

Duncan, Greg J., Lars Bergman, Angela L Duckworth, Katja Kokko, Anna-Liisa Lyyra, Molly Metzger, Lea Pulkkinen, and Sharon Simonton. 2012. "Child Skills and Behaviors in Intergenerational Inequality." In *From Parents to Children: The Intergenerational Transmission of Advantage*, edited by Markus Jantti and Timothy M. Smeeding, pp. 207–234. Russell Sage Foundation.

Heckman, James J., Jora Stixrud, and Sergio Urzua. 2006. "The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior." *Journal of Labor Economics* 24:411–482.

Kopczuk, Wojciech, Emmanuel Saez, and Jae Song. 2010. "Earnings Inequality and Mobility in the United States: Evidence from Social Security Data since 1937*." *Quarterly Journal of Economics* 125:91–128.

McLeod, Jane D. and Karen Kaiser. 2004. "Childhood Emotional and Behavioral Problems and Educational Attainment." *American Sociological Review* 69:636–658.

Piketty, Thomas and Emmanuel Saez. 2003. "Income Inequality in The United States, 1913-1998." *Quarterly Journal of Economics* 118:1–39.

Reardon, Sean F. 2011. "The Widening Academic Achievement Gap Between the Rich and the Poor: New Evidence and Possible Explanations." In *Whither Opportunity? Rising Inequality, Schools, and Children's Life Chances.*, edited by Greg Duncan and Richard J. Murnane. New York: Russell Sage Foundation.

Tremblay, Richard E, Willard W. Hartup, and John Archer (eds.). 2005. *Developmental Origins of Aggression*. The Guilford Press, 1 edition.

Table 1: Comparing NLSY Birth Cohorts

	NLSY79-CHYA 1991-1994	NLSY97 1982-1984
Female	51.3	47.6
Non-Hispanic White	56.5	56.2
Black	25.3	24.3
Hispanic	18.1	19.5
PIAT Math Percentile score	59.4 (1.0)	40.3 (0.6)
Socioemotional Problems	0.4 (0.0)	1.0 (0.0)
Home Environment	6.1 (0.1)	3.6 (0.0)
Rural	12.3	24.8
Urban	78.9	70.7
Residence Missing	8.8	4.4
Log Household Income	10.7 (0.1)	10.3 (0.0)
No under age 18	0.5	0.0
1-2 under age 18	35.0	56.2
3+ under age 18	7.3	43.8
Under age 18 missing	0.1	0.0
Maternal age 14-10	0.0	22.8
Maternal age 20-29	32.5	60.1
Maternal age 30-39	0.7	0.1
Maternal age 40-49	0.0	0.0
Maternal age missing	0.0	7.0
Mom HS Dropout	10.8	19.7
Mom HS Graduate	30.7	33.2
Mom Some College	27.3	24.2
Mom College or More	31.1	18.2
Maternal education missing	0.1	4.8
N	805	2235

Table 2: Standardized beta coefficients of regression models on PIAT for birth cohorts 1982-1984, NLSY97

	M1	M2	M3	M4
Socioemotional Problems	−0.097***	−0.065 * *	−0.047*	−0.044*
	(−4.61)	(−3.27)	(−2.45)	(−2.35)
Hispanic		0.108***	0.087***	0.127***
		(4.57)	(3.74)	(5.52)
Non-Hispanic White		0.417***	0.329***	0.300***
		(17.63)	(13.28)	(12.37)
Female		−0.032	−0.035+	−0.031+
		(−1.61)	(−1.81)	(−1.68)
Home Environment			0.187***	0.122***
			(8.64)	(5.59)
Urban			0.023	0.004
			(1.08)	(0.21)
Residence Missing			0.007	0.013
			(0.36)	(0.66)
Log Household Income			0.071***	0.039+
			(3.35)	(1.86)
1-2 under age 18			0.037+	0.024
			(1.87)	(1.24)
Mom HS Graduate				0.131***
				(4.97)
Mom Some College				0.208***
				(7.96)
Mom College or More				0.284***
				(10.72)
Maternal education missing				0.064 * *
				(3.16)
N	2235	2235	2235	2235

Standardized beta coefficients; t statistics in parentheses
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 3: Standardized beta coefficients of regression models on PIAT for birth cohorts 1991-1994, Children of NLSY79 1986-2010

	M1	M2	M3	M4
Socioemotional Problems	−0.116***	−0.077*	−0.060+	−0.051
	(−3.31)	(−2.35)	(−1.87)	(−1.63)
Hispanic		0.086*	0.054	0.084*
		(2.22)	(1.43)	(2.23)
Non-Hispanic White		0.405***	0.291***	0.281***
		(10.42)	(7.12)	(6.97)
Female		−0.073*	−0.072*	−0.080*
		(−2.24)	(−2.29)	(−2.57)
Home Environment			0.071*	0.058+
			(2.15)	(1.78)
Urban			0.091*	0.064
			(2.31)	(1.63)
Residence Missing			0.123**	0.090*
			(3.04)	(2.24)
Log Household Income			0.140***	0.097**
			(4.21)	(2.86)
1-2 under age 18			−0.123***	−0.083*
			(−3.56)	(−2.39)
3+ under age 18			−0.142***	−0.092**
			(−4.13)	(−2.61)
Under age 18 missing			−0.017	−0.004
			(−0.51)	(−0.13)
Mom HS Graduate				0.122*
				(2.29)
Mom Some College				0.115*
				(2.15)
Mom College or More				0.294***
				(5.07)
Maternal education missing				−0.002
				(−0.06)
N	805	805	805	805

Standardized beta coefficients; t statistics in parentheses
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001