Abstract 1 Title Page

Title: Predicting children's transitions from Head Start to low-performing schools in Chicago: The roles of exposure to poverty-related risk and to early childhood intervention

Choice of Conference Section: Early Education

Authors: Fuhua Zhai, Ph.D. & C. Cybele Raver, Ph.D.

Fuhua Zhai, Ph.D.
Post-doctoral Research Scholar
Institute of Human Development and Social Change
Steinhardt School of Culture, Education, and Human Development
New York University
Address: 726 Broadway, Suite 525 Room 529, New York, NY 10003
Phone: (212) 998-5209
Email: fuhua.zhai@nyu.edu

C. Cybele Raver, Ph.D.
Professor of Applied Psychology
Institute of Human Development and Social Change
Steinhardt School of Culture, Education, and Human Development
New York University
Address: 726 Broadway, Suite 525 Room 531, New York, NY 10003
Phone: (212) 998-5519
Email: cybele.raver@nyu.edu

Abstract 1 Body

Background/Context:

Exposed to a wide range of economic and psychosocial stressors, children in low-income families face greater chances of developing emotional and behavioral problems. For instance, it has been reported that the prevalence of oppositional defiant disorder (ODD) and attention deficit hyperactivity disorder (ADHD) is higher among young children from low-income families than their more advantaged peers (Currie, 2005; Reid, Webster-Stratton, & Baydar, 2004). Children's behavior problems, in turn, are strongly associated with a host of subsequent developmental risks such as delinquency, substance abuse, school difficulties and dropout, unemployment, and health problems (Brooks-Gunn, Duncan, & Aber, 1997; Li-Grining,Votruba-Drzal, Bachman, & Chase-Lansdale, 2006; Reid et al., 2004). Poverty rates are high in cities like Chicago, in which 87% of children were eligible for free or reduced-priced lunch and more than 25% of the third graders were not able to pass their school district's gated proficiency standards (Roderick & Nagaoka, 2005).

Moreover, early school years, especially from kindergarten to third grade, are a critical transitional period not only for promoting children's scholastic and psychosocial development but also for helping prevent the dissipating effects of earlier interventions (Reynolds, Magnuson, & Ou, 2006). Research has consistently shown that the benefits gained by participants, especially those in low-income families, from high-quality early interventions, including Head Start, can be sustained to later school years and even adulthood for those who attend continuing enrichment programs in early school years; but tend to fade out by the second or third year of formal schooling for those who attend inferior schools subsequently (Currie, 2001; Currie & Thomas, 1995; Lee & Loeb, 1995; Magnuson, Ruhm, & Waldfogel, 2007; Takanishi & Bogard, 2007). Therefore, it is important to examine the roles of exposure to poverty-related risk and to early childhood intervention in predicting children's transitions from Head Start to low-performing schools, which have been understudied in the literature.

Purpose/Objective/Research Question/Focus of Study:

This paper investigates the socioeconomic contexts navigated by low-income children enrolled in the Chicago School Readiness Project (CSRP), as they made the transition from preschool to elementary school. We focus on the following two questions. First, do families' exposure to poverty-related risks (i.e., low income, maternal education, and employment engagement) change for the better or for the worse, from the fall of preschool to the fall of kindergarten? Second, we examine the share of CSRP-enrolled preschoolers who subsequently attended kindergarten in low-performing elementary schools. We ask whether children's chances of entry into a lower-performing school differ as a function of (a) their current or past exposure to poverty-related risks, (b) having attended a program randomly assigned to treatment versus control group during the intervention year of CSRP, and (c) having attended a Head Start program that was assessed to be lower-quality at pre-treatment baseline.

Settings:

A total of 35 classrooms at 18 Head Start sites located in seven of the most economically disadvantaged neighborhoods in Chicago

Population/Participants/Subjects:

Overall 602 children and 94 teachers participated in CSRP. Children on average were 4 years old and about half were boys. About 66% of participating children were non-Hispanic Black, 26% were Hispanic, and 8% were members of other racial/ethnic groups. Teachers on average were 40 years old and almost all (97%) were female. About 70% of teachers were non-Hispanic Black, 20% were Hispanic, and 10% were non-Hispanic White.

Intervention/Program/Practice:

The CSRP intervention included three components of services. The first was a 30-hour teacher training focusing on behavior management strategies, which were adapted from the Incredible Years teacher training module (Webster-Stratton, Reid, & Hammond, 2004). All treatment-assigned teachers were invited to participate in the five 6-hour training sessions held on Saturdays from September to March during the Head Start year. Paired with the training, the second component was the placement of mental health consultants (MHCs) in treated classrooms. MHCs attended classes one morning per week to coach teachers in implementing the behavior management strategies as well as assisting teachers with stress reduction. The third component included individual MHC services for a small number of children (three to four children per class) with high emotional and behavioral problems from March to May in the Head Start year. To ensure that the child-staff ratio was similar across treatment and control classrooms, teachers in the control group were given staffing support by a teacher's aide who only provided an extra pair of hands and eyes during everyday classroom activities for the same amount of time per week as the MHCs in the treatment group.

Research Design:

CSRP randomly assigned a multifaceted classroom-based intervention to two cohorts of Head Start children and teachers in seven of the most economically disadvantaged neighborhoods in Chicago, with Cohort One participating from fall to spring in 2004–05 and Cohort Two from fall to spring in 2005–06. Using a clustered randomized controlled trial (RCT) design and a pairwise matching procedure (Bloom, 2005), we first identified nine pairs of matched sites based on a range of site-level demographic characteristics that were collected by each site and reported annually to the federal government. One site in each matched pair then was randomly assigned to the treatment group and the other to the control group. Two classrooms from each site were initially included. One classroom left after randomization due to Head Start funding cuts. As a result, 35 classrooms (i.e., 18 in the treatment and 17 in the control groups) participated in the CSRP.

Data Collection and Analysis:

CSRP-enrolled children were followed from Head Start programs into kindergarten, with follow-up parent and teacher interviews completed in the fall of the follow-up year (92% had follow-up data from one or more reporters). Preliminary analyses of school-based follow-up data suggest that children made the transition from 35 Head Start preschool classrooms to over 170 kindergarten classrooms. Those schools whose percentage of children meeting ISAT testing criteria (as reported by Chicago Public Schools elementary scorecard) fell lower than one standard deviation below the mean of all elementary schools are coded as "low-performing." Poverty-related risk is measured by three indicators: family income-to-needs ratios (i.e., less than half the federal threshold in the previous year), maternal educational attainment (i.e., less than a high school degree), and mothers' employment (i.e., 10 hours or less of work per week). Data of poverty-related risk were collected in the fall of both years. Other child-level covariates include the child's gender, race/ethnicity, whether Spanish was spoken at home, whether he/she was in a

single-parent family, and his/her behavioral problems in the fall of Head Start. The quality of Head Start programs in which children were initially enrolled at pretreatment baseline was also measured, as indexed by the Early Childhood Environment Rating Scale-R (ECERS-R; Harms, Clifford, & Cryer, 2003). Other classroom-level covariates collected in the fall of Head Start include teacher behavior management skills, classroom emotional climate, class size, and the number of adults in the classroom.

To answer our first question, descriptive analyses of CSRP-enrolled children's exposure to poverty-related stressors are presented. To address the second question, we estimate children's propensity to be enrolled in a low-performing elementary school using a three-level hierarchical logistic regression model with child covariates at Level 1, Head Start classroom covariates at Level 2, and paired Head Start site dummy variables at Level 3.

Following the notations in Raudenbush and Bryk (2002), Level 1 is specified in Equations (1) to (3):

Sample model: $Y_{ijk} \mid \varphi_{ijk} \sim B(1, \varphi_{ijk})$ (1)

Link function: $\eta_{ijk} = \log(\frac{\varphi_{ijk}}{1-\varphi_{ijk}})$ (2)

Structural model: $\eta_{ijk} = \pi_{0jk} + \sum_{m} \pi_{mjk} X_{mijk}$ (3)

where Y_{tij} is whether child *i* in class *j* at Head Start site *k* attended low-performing schools (1 = yes and 0 = no); φ_{ijk} is the expected probability of attending low-performing schools, which is normally distributed; η_{ijk} is the log of the odds of attending low-performing schools; and $\sum_{m} \pi_{mjk} X_{mijk}$ is the vector of the sum of *m* child-level covariates.

Equation (4) shows the specification of Level 2:

$$\pi_{mjk} = \beta_{m0k} + \sum_{n} \beta_{mnk} C_{njk} + r_{mjk} \quad (4)$$

where $\sum_{n} \beta_{mnk} C_{njk}$ represents the sum of *n* Head Start classroom-level covariates; and r_{pij} is the random effect with mean of 0.

Level 3 is specified in Equation (5):

$$\beta_{mnk} = \gamma_{mn0} + \gamma_{001} T_k + \sum_{p} \gamma_{mnp} S_{pk} + u_{mnk} \quad (5)$$

where $\gamma_{001} T$ is the treatment assignment at Head Start site level (i.e., 1 = treatment, 0 = control); $\sum_{p} \gamma_{mnp} S_{pk}$ denotes the sum of *p* paired Head Start site-level dummy variables; and u_{pqj} is the random effect representing deviation of site *k*'s coefficient (β_{mnk}) from its predicted value. Since the treatment assignment was conducted among paired Head Start sites, including site-level dummy variables at Level 3 is able to control for the fixed effects of paired Head Start sites.

Findings/Results:

(Please insert table 1 here) Table 1 presents the descriptive statistics of children in the sample by their treatment status in the fall of Head Start year. Overall children in the CSRP control group were more likely to attend low-performing schools in the fall of kindergarten (i.e., 73%) compared to children in the treatment group (i.e., 60%). The measures of child and

classroom characteristics overall were balanced across the treatment and control groups.

(Please insert table 2 here) Table 2 shows the distribution of poverty-related risk (i.e., low income, maternal education, and employment engagement) in the fall of both Head Start and kindergarten. Overall children's exposure to poverty-related risk remained highly stable from Head Start to kindergarten, with a correlation coefficient of 0.83. In both years, approximately 9% of CSRP-enrolled children had three risks, one quarter had two risks, close to 30% had one risk, and about 35% had no risk.

Our preliminary analyses find that overall 338 CSRP-enrolled children attended kindergarten at the time of data collection and had valid information on the covariates. To examine the roles of exposure to poverty-related risk and to the CSRP intervention in their enrollment of low-performing schools in kindergarten, we conduct preliminary analyses using the three-level hierarchical logistic regression model specified above and present the results in Table 3. In Model 1 we only include the variable of treatment assignment. Model 2 further includes the paired Head Start site dummy variables. We include child-level covariates in Model 3 and classroom covariates in Model 4.

(Please insert table 3 here) As shown in Table 3, overall we find that children who were in the CSRP treatment were less likely to attend low-performing schools compared to their peers who were in the control group in the Head Start year (with an odds ratio of 0.35 in Model 4). The finding is significant in Models 2 to 4 after controlling for the fixed effects of paired Head Start sites. Children who had more poverty-related risks in the fall of Head Start were more likely to attend low-performing schools in kindergarten (with an odds ratio of 6.89 in Model 4). In addition, the results in Table 3 also suggest that African American children were more likely to attend low-performing schools than Hispanic children. We do not find the significant effects of attending low-quality Head Start classrooms (measured by one standard deviation below the mean of ECERS-R scores in the fall of Head Start) on children's odds of enrollment in low-performing schools in kindergarten.

Based on these preliminary findings, we will conduct further analyses to examine the effects of children's current exposure to poverty-related risks on children's entry to low-performing schools. In addition, we will also conduct sensitivity tests to examine whether the findings are robust when using different cut-off points (e.g., below the medians or a half of standard deviations) for the definitions of low-performing schools in kindergarten and low-quality Head Start program at pre-treatment baseline.

Conclusion:

Previous research has found that the CSRP intervention had significant effects on improving classroom processes as well as children's social-emotional skills, self-regulation, and pre-academic skills, and reducing their behavior problems (Raver et al., 2008; Raver et al., 2009; Raver et al., in press). In this study we find that even in the period prior to the economic recession (2004-2006), families with young children in Chicago were facing high levels of poverty-related risk. On average, the CSRP-enrolled children had high rates of attending low-performing schools in the transition from Head Start to kindergarten. Our preliminary evidence shows that the CSRP intervention may set children on more positive educational trajectory since children in the treatment group were less likely to attend low-performing schools compared to their peers in the control group. To sustain the benefits of the CSRP intervention as well as those of Head Start, more help should be provided to these disadvantaged children throughout their subsequent school years.

Appendix A. References

Bloom, H. S. (2005). *Learning more from social experiments: Evolving analytic approaches*. New York: Russell Sage.

Brooks-Gunn, J., Duncan, G., & Aber, J. L. (Eds., 1997). *Neighborhood Poverty: Context and Consequences for Children (Volume 1)*. New York, NY: Russell Sage.

Currie, J. (2001). Early childhood intervention programs: What do we know? *Journal of Economic Perspectives, 15*, 213-238.

Currie, J. (2005). Health disparities and gaps in school readiness. *The Future of Children, 15*, 117-138.

Currie, J., & Thomas, D. (1995). Does Head Start make a difference? *American Economic Review, 85*, 341-364.

Harms, T., Clifford, R. M., & Cryer, D. (2003). *Early childhood environment rating scale, revised edition*. New York, NY: Teachers College Press.

Lee, V. E., & Loeb, S. (1995). Where do Head Start attendees end up? One reason why preschool effects fade out. *Educational Evaluation and Policy Analysis, 17*, 62-82.

Li-Grining, C. P., Votruba-Drzal, E., Bachman, H. J., & Chase-Lansdale, P. L. (2006). Are certain preschoolers at risk in the era of welfare reform? Children's effortful control and negative emotionality as moderators. *Children and Youth Services Review*.

Magnuson, K., Ruhm, C., & Waldfogel, J. (2007). The persistence of preschool effects: Do subsequent classroom experiences matter? *Early Childhood Research Quarterly, 22*, 18-38.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods.* Thousand Oaks, CA: Sage Publications Inc.

Raver, C. C., Jones, S. M., Li-Grining, C. P., Metzger, M., Smallwood, K., & Sardin, L. (2008). Improving preschool classroom processes: Preliminary findings from a randomized trial implemented in Head Start settings. *Early Childhood Research Quarterly, 23*, 10-26.

Raver, C. C., Jones, S. M., Li-Grining, C. P., Zhai, F., Metzger, M. W., & Solomon, B. (2009). Targeting children's behavior problems in preschool classrooms: A cluster-randomized controlled trial. *Journal of Consulting and Clinical Psychology, 77*, 302-316.

Raver, C. C., Jones, S. M., Li-Grining, C. P., Zhai, F., Bub, K, & Pressler, E. (in press). CSRP's impact on low-income preschoolers' pre-academic skills: Self-regulation and teacher-student relationships as two mediating mechanisms. *Child Development*.

Reid, M. J., Webster-Stratton, C., & Baydar, N. (2004). Halting the development of conduct problems in Head Start children: The effects of parent training. *Journal of Clinical Child and Adolescent Psychology, 33,* 279-291.

Reynolds, A., Magnuson, K., & Ou, S. (2006). P-3 education: Programs and practices that work in children's first decade. *Foundation for Child Development Working Paper, Advancing PK-3, No. 6,* Jan. 2006.

Roderick, M., & Nagaoka, J. (2005). Retention under Chicago's high-stakes testing program: Helpful, harmful, or harmless? *Educational Evaluation and Policy Analysis, 27,* 309 – 340.

Takanishi, R., & Bogard, K. L. (2007). Effective educational programs for young children: What we need to know. *Child Development Perspectives, 1*, 40–45.

Webster-Stratton, C., Reid, M. J., & Hammond, M. (2004). Treating children with early-onset conduct problems: Intervention outcomes for parent, child, and teacher training. *Journal of Clinical Child and Adolescent Psychology, 33*, 105–124.

Appendix B. Tables and Figures

Table 1. Descriptive Statistics by Sample

	Full Sample (n = 536)	Treatment Group (n = 279)	Control Group (n = 257)
Outcome Variables			
Attending low-performing schools	0.66 (0.47)	0.60 (0.49)	0.73 (0.45)
Child Covariates			
Boy	0.47 (0.50)	0.51 (0.50)	0.42 (0.50)
African American	0.67 (0.47)	0.68 (0.47)	0.67 (0.47)
Poverty-related risk	1.09 (0.99)	1.15 (1.00)	1.03 (0.99)
Spanish-speaking	0.18 (0.39)	0.17 (0.38)	0.19 (0.39)
Single-parent family	0.70 (0.46)	0.72 (0.45)	0.68 (0.47)
Classroom Covariates			
Classroom overall quality (ECERS)	4.71 (0.79)	4.45 (0.73)	4.98 (0.75)
Teacher behavior management	4.88 (1.03)	4.60 (1.06)	5.18 (0.91)
Classroom emotional climate	16.08 (2.75)	15.42 (2.77)	16.81 (2.53)
Class size	16.42 (2.66)	16.55 (2.63)	16.27 (2.68)
Number of adults in classroom	2.40 (0.69)	2.51 (0.77)	2.28 (0.56)

Note: means with standard deviations in parentheses

Table 2. Distribution of Poverty-related Risk

Number of Risks	% children in fall Head Start (n = 537)	% children in fall kindergarten (n = 481)
0	35.38	38.67
1	29.98	28.07
2	24.95	24.74
3	9.68	8.52
	100.00	100.00

Table 3. Preliminary Results: Attending Low-performing Schools in K (n = 338)

	M1	M2	M3	M4
Treatment	0.45	0.35*	0.29**	0.35*
	(-1.05)	(-3.04)	(-3.32)	(-2.37)
Level 1 Covariates				
Boy			0.78	0.78
			(-0.71)	(-0.73)
Race/ethnicity (Hispanic omitted)				
African American			5.74*	6.89*
			(2.41)	(2.51)
Other race/ethnicity			1.22	1.31
			(0.25)	(0.34)
Poverty-related risk			1.42*	1.43*
			(2.03)	(1.99)
Spanish-speaking			1.32	1.24
			(0.50)	(0.38)
Single-parent family			1.29	1.26
			(0.70)	(0.63)
Total behavioral problems HS fall			1.06+	1.06
			(1.64)	(1.55)
Level 2 Covariates				
Low classroom quality (ECERS-R)				0.57
				(-1.04)
Teacher behavior management				0.89
				(-0.22)
Classroom emotional climate				1.00
				(-0.00)
Class size				0.89
				(-0.97)
Number of adults in classroom				1.60
				(0.75)
Level 3 Site Dummy Variables	*No*	*Yes*	*Yes*	*Yes*
Intercept	3.35*	2.64+	0.50	1.44
	(2.26)	(1.83)	(-0.87)	(0.13)

Notes: odds ratios with t-statistics in parentheses; ** p<0.01, * p<0.05, + p<0.10