Abstract Title Page

Title: Long-term follow up of CSRP: Understanding students' academic achievement post-treatment

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Abstract Body

Background/context:

Recent early childhood intervention studies have targeted the improvement of children's school readiness, where randomized intervention programs have successfully enhanced early socioemotional and academic competence among low-income children. The Head Start REDI (Research-based, Developmentally Informed) program, for instance, involves language- and literacy-specific components (e.g., interactive reading, phonological awareness games, and print activities), as well as techniques to improve children's control of impulsive behavior and organization of goal-directed activity (Bierman et al., 2008). Additionally, the Tools of the Mind program has successfully improved children's cognitive self-regulation (i.e., executive functioning) (Diamond, Barnett, Thomas, & Munro, 2007). Also, the Chicago School Readiness Project (CSRP), a multicomponent mental health intervention that included teacher training and coaching on behavior management strategies, improved academic skills via increases in self-regulation (i.e., executive functioning, attention and impulse control) among preschoolers attending Head Start programs (Raver et al., 2011). But what happens when children leave randomly assigned and highly controlled intervention contexts for "real world" early elementary classroom contexts where there is tremendous variance in classroom and school quality?

Purpose / objective / research question / focus of study:

In our poster presentation, we will examine the impact of CSRP on students' academic achievement in elementary school. First, we will provide upper- and lower-bound estimates of the impact of CSRP on students' academic achievement, taking into account their subsequent nonrandom selection into higher versus lower quality school settings. Second, we will test whether estimates of treatment impact vary as a function of key child (e.g., behavioral and poverty-related risk) and school characteristics (e.g., lower school quality in more highly disadvantaged neighborhoods). Third, taking a comprehensive view of children's development, and controlling for treatment status, we will examine the extent to which classroom, family, and child characteristics, including more adaptive approaches to learning (e.g., on task behavior), shapes students' academic achievement.

Setting:

Data were drawn from children who participated in CSRP in preschool and in follow-up waves occurring 1, 2, and 4 years after treatment. The CSRP preschool sites were selected on the basis of (a) receipt of Head Start funding, (b) having two or more classrooms that offered "full day" programming, and (c) location in one of seven high-poverty neighborhoods (see Raver et al., 2008, for a detailed discussion of exclusionary criteria), in an effort to balance generalizability and feasibility. The CSRP staff completed block-by-block surveys of all seven neighborhoods, in which all child-serving agencies were identified and screened to determine whether they met site selection criteria (including receipt of Head Start funding). Eligible sites were then invited to self-nominate for participation in the research project. Eighteen sites across seven neighborhoods completed the process and were included as CSRP sites, and two classrooms within each site were randomly selected for participation. Research staff successfully recruited 83% of the children enrolled in classrooms between Labor Day and the assigned enrollment cutoff date in mid-October of the school year.

In subsequent waves, children were followed into kindergarten, first grade, and third grade. Children dispersed into 94 kindergarten and 182 third grade classrooms with response rates of 73.6% and 77.9%, respectively. The follow-up study conducted at first grade involved administrative data only; no new data was collected.

Population / Participants / Subjects:

The original CSRP sample consists of 602 children enrolled in 35 classrooms nested within 18 Head Start sites. Enrolled children initially ranged from ages 3 to 5 (29% identified as Latino/a, and 64% identified as African American).

Across waves, the age of children spanned from 4 to 8 years old, with the average age during intervention year being 4 years old, and the most recent follow up being at 4 years post-treatment. Preliminary analyses included 135 students in kindergarten and 165 in 1st grade. All data for third grade are still being collected and cleaned but will be ready for analysis by January, 2011.

Intervention / Program / Practice:

The principal aim of the CSRP intervention was to marshal several primary programmatic components to improve low-income preschool-aged children's school readiness by increasing their emotional and behavioral adjustment. The first programmatic component emphasized workforce development, where CSRP provided teachers with 30 hours of training in strategies (e.g., rewarding positive behavior, redirecting negative behavior) that they could employ to provide their classrooms with more effective regulatory support and better management (Raver et al., 2008; Webster-Stratton, Reid, & Hammond, 2001; Webster-Stratton, Reid, & Stoolmiller, 2008). A second key component was to provide weekly "coaching" through classroom-based consultation provided by a mental health consultant (MHC) who supported teachers while they tried new techniques learned in the teacher training (Donohue, Falk, & Provet, 2000; Gorman-Smith, Beidel, Brown, Lochman, & Haaga, 2003). As an additional component, MHCs spent a significant portion of the school year conducting stress reduction workshops to help teachers to limit burnout. This was based on the premise that adults might have a difficult time implementing new strategies of building positive relationships with children who demonstrate especially challenging behaviors when the adults themselves may feel less well supported. Finally, MHCs provided direct child-focused consultation, working one-on-one with three to five children who exhibited the most challenging behavioral problems, with the view that these children might benefit from access to clinical psychological services that could be delivered through the Head Start setting (Perry, Dunne, McFadden, & Campbell, 2008). The intervention program lasted throughout the preschool year, with no additional CSRP services offered during the follow-up years.

Research Design:

To test the efficacy of this model, our research team conducted a clustered randomized controlled trial (RCT) in Chicago, IL, where children were embedded in classrooms, which were nested in sites. Through extensive collaboration with community-based Head Start programs in seven of Chicago's most economically disadvantaged neighborhoods, CSRP was able to randomly assign nine Head Start sites to receive multi-component intervention services (and therefore serve as the "treatment group") and another nine Head Start sites to receive a lower-

intensity package of services (including the support of a lower-cost "teacher's aide" in the classroom one day a week); these latter sites were designated as "control group" classrooms.

Though trainings were offered to all teachers randomized to treatment, not all teachers were able to take advantage of these sessions: Teachers attended three of the five trainings on average. Similarly, even though classroom visits were a main ingredient of the intervention package, some classrooms received as few as 21 visits while other classrooms received as many as 40 visits, with an average of 29 visits (or 128 hours of consultation) during the academic year. Analyses of consultants' logs suggest that the most common social services offered to teachers were social support and coaching during MHCs' classroom visits.

Data Collection and Analysis:

Data collection. Importantly, our study includes multiple indicators of children's academic achievement. First, an important feature of our study is the inclusion of school records data, obtained from Chicago Public Schools, on children's performance on direct assessments of various literacy skills (e.g., phonological awareness) based on the *DIBELS* (*Dynamic Indicators of Basic Early Literacy Skills)*. Second, teachers reported on children's language, literacy, and math skills, based on measures from the Early Childhood Longitudinal Study-Kindergarten Cohort. Third, CSRP was also able to access students' grades from the Chicago Public Schools (Mark, Kaltreider, & Campbell, 2001; Mason, Schroeter, Combs, & Washington, 1992; Miller, Allensworth, & Kochanek, 2002; Rhoades & Kratochwill, 1998).

Parents completed demographic interviews, which included questions on children's age, gender, and race/ethnicity, and questions on marital status and poverty-related risk. The number of poverty-related risks was an index based on a sum of dummy variables indicating whether families lived below half the federal poverty threshold, mothers held a high school degree, and mothers worked 10 or fewer hours per week.

To measure children's behavior problems, teachers completed the Behavior Problems Index (BPI; Zill, 1990). The original parent-report measure was adapted from several existing studies of children's behavior problems and modified in minor ways, where the version used here was a 28-item teacher-report measure (Zill, 1990). The measure included 18 externalizing items (e.g., "breaks things on purpose or deliberately destroys his/her own or another's things") and 10 internalizing items (e.g., "is withdrawn, does not want to get involved with others"). We used a 3-point scale, ranging from 0 = not true to 2 = very/often true. Items were summed into externalizing and internalizing composites, with alphas of .92 and .80, respectively. Inter-rater reliability was adequate, with ICC values ranging from .60 - .73. Each of the BPI and SCBE scores were averaged across reporters that included the child's teacher and teaching assistant.

Additional analyses will examine the roles of students' more positive approaches to learning (e.g., on task behavior) and broader classroom characteristics. To capture kindergarteners' positive approaches to learning (e.g., children's on task behavior), teachers answered questions from the Cooper Farran Behavior Rating Scale (CFBRS; Cooper & Farran, 1991). We will use two components of the Classroom Assessment Scoring System (CLASS; LaParo, Pianta, & Stuhlman, 2004). With CSRP's focus on teacher-child interaction, we will focus on the *behavior management* (e.g., effective methods to prevent children's misbehavior)

subscale and the *emotional climate* subscore (α = .92), which was composed of ratings of positive climate (e.g., enjoyment), negative climate (e.g., harshness), and teacher sensitivity (e.g., responsiveness). Items were based on a global, 7-point Likert scale, with scores of 1 and 2 in the "low" range, scores of 3 through 5 in the "moderate" range, and scores of 6 and 7 in the "high" range. With 75% of observations conducted by two observers, inter-rater reliability alphas were .66 and .95 for behavior management and emotional climate, respectively. Covariates also included: number of children, number of adults, how many teachers in the classroom held a bachelor's degree, experience with depressive symptoms (Kessler et al., 2002; α = .65), and an index of work-related stressors (Curbow, Spratt, Ungaretti, McDonnell, & Breckler, 2000; Li-Grining et al., 2010) as well.

Preliminary data analysis. Given the nested nature of our data, academic outcomes have been predicted using hierarchical linear models, with child and family characteristics at level 1, classroom characteristics at level 2, and site characteristics, including treatment status, at level 3.

Findings / Results:

Tables 1 and 2 display descriptive statistics, showing variance in a range of characteristics throughout the treatment and follow-up years. We will capitalize on that variance by testing the research questions outlined above. Our preliminary analyses detect non-significant intervention impacts on children's DIBELS scores and language, literacy, and math skills. On one hand, additional analyses may reveal significant impacts. On the other hand, it may be that we did not have enough power to detect significant differences between the treatment and control groups, given the smaller analytic samples used in our preliminary analyses. These smaller samples are due to various factors such as the inclusion of limited school records data, lag time between cohorts, different ages at which preschoolers began participating in CSRP, attrition, and retention. Additional analyses may find that particular classroom characteristics and kindergarteners' more adaptive approaches to learning play important roles in their later academic achievement, net of treatment status.

Conclusions:

In our discussion, we will reflect on these issues, our findings, and the complex factors that need to be considered when conducting rigorous, longitudinal education research on early intervention programs in school settings. By examining both treatment impacts and the role of classroom, family, and child characteristics on students' long-term academic achievement, we hope to inform the design of future, multi-year early childhood education interventions that span across preschool, kindergarten, and elementary school.

Appendices

Appendix A. References

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Appendix B. Tables and Figures

Table 1

Descriptive Statistics on Child and Family Characteristics

Variable	*M or %*	*SD*
Child Characteristics		
Age (months)	49.16	7.38
Gender (boy)	47.0%	
Race/Ethnicity		
African American	66.0%	
Latino	27.0%	
Other	7.0%	
Externalizing Behavior Problems	5.76	5.77
Internalizing Behavior Problems	2.25	2.46
Family Characteristics		
Married	21.0%	
Family Size	4.41	1.68
Number of Poverty-Related Risks	1.09	0.99

Note. Behavior problems were captured using teacher reports of the Behavior Problem Index (BPI; Zill, 1990). Number of poverty-related risks is an index based on a sum of dummy variables indicating whether families lived below half the federal poverty threshold, mothers held a high school degree, and mothers worked 10 or fewer hours per week

Table 2

Descriptive Statistics on Academic Measures

		1 year post-treatment					
		Beginning of Year		Middle of Year		End of Year	
Variable		*M*	*SD*	*M*	*SD*	*M*	*SD*
DIBELS							
	PSF	N/A		8.31	7.87	21.87	17.37
	NWF	N/A		10.41	11.95	21.5	18.19
	WUF	5.53	9.18	16.33	14.22	29.92	19.21
Language & Literacy		2.89	1.01	N/A		N/A	
Math Skills		2.75	1.02	N/A		N/A	

		2 years post-treatment					
		Beginning of Year		Middle of Year		End of Year	
Variable		*M*	*SD*	*M*	*SD*	*M*	*SD*
DIBELS							
	PSF	18.80	15.52	26.50	18.03	37.52	17.03
	NWF	19.34	14.60	33.93	22.88	44.63	26.50
	WUF	19.28	16.13	34.51	20.44	41.79	23.11

		4 years post-treatment*					
		Beginning of Year		Middle of Year		End of Year	
Variable		*M*	*SD*	*M*	*SD*	*M*	*SD*
DIBELS							
	RTF	30.58	18.96	38.51	29.25	46.03	32.10
	ORF	54.85	32.08	77.58	37.50	92.48	36.69
	WUF	37.13	19.16	42.69	20.87	49.66	24.97
Language & Literacy		4.24	0.77	N/A		N/A	
Math Skills		4.14	0.86	N/A		N/A	

Note. The DIBELS (Dynamic Indicators of Basic Early Literacy Skills) subtests include phoneme segmentation fluency (PSF) which assesses phonological awareness, nonsense word fluency (NWF) which assesses letter-sound correspondence, word use fluency (WUF) which assesses vocabulary and oral language, retell fluency (RTF) which assesses comprehension, and oral reading fluency (ORF) which assesses accuracy and fluency with connected text

*Currently, data is available at 4 years post-treatment for Cohort 1, only