
Dosage Effects in Early Care and Education: Evidence from Secondary Data Analysis

Presentation at the Biennial Meeting of the Society for Research in
Child Development

Montreal, Canada

March 31, 2011

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Background

The literature review indicates that

- **greater exposure to early care and education (ECE) is associated with stronger cognitive outcomes, but less positive social outcomes in young children**
- **there are multiple ways of measuring dosage**
 - **Hours/week of care**
 - **Number of years**
 - **Amount of time spent in instruction**
- **it is important to address selection issues more rigorously**
- **further analysis involving the joint examination of dosage with ECE quality is needed**

Research Questions

- **Main Effect**: Is dosage of exposure to early care and education or dosage of specific types of instruction associated with child outcomes in preschool?
 - Exposure over all (hours/week, attendance)
 - Exposure to specific type of instruction
 - Length of participation in program
- **Quality Interaction**: Does dosage interact with quality to suggest that dosage effects are stronger in high quality program?

Analysis 1: Instructional Time—Measures

- **NCEDL: Emerging Academics Snapshot (EAS)—proportion of time spent in reading and math activities**
- **PCER: Teacher Behavior Rating Scale (TBRs)—rating of the quantity and quality of reading and math instruction**
- **Miami Study: OMLIT—rating of quantity and quality of literacy instruction**

Analytic Approaches

- **For instructional time and hours per week**
 - **2 level HLM: Added dosage to model that included quality and covariates**
 - **Tested linear and nonlinear associations of dosage with outcomes; dropped quadratic term if not significant**
 - **Tested interactions between dosage and quality measures; dropped the interaction if not significant**

Analysis 1: Instructional Time—Findings

- **Linear association with child outcomes**
 - **Instructional time in reading positively associated with reading skills in**
 - NCEDL ($.03 < d < .05$)
 - Miami study ($.14 < d < .18$),
 - not PCER
 - **Instructional time in math positively associated with math skills in**
 - NCEDL ($.04 < d < .07$)
 - PCER ($d < .08$)

- **No evidence of interaction between instructional time and quality**

Analysis 2: Hours per Week

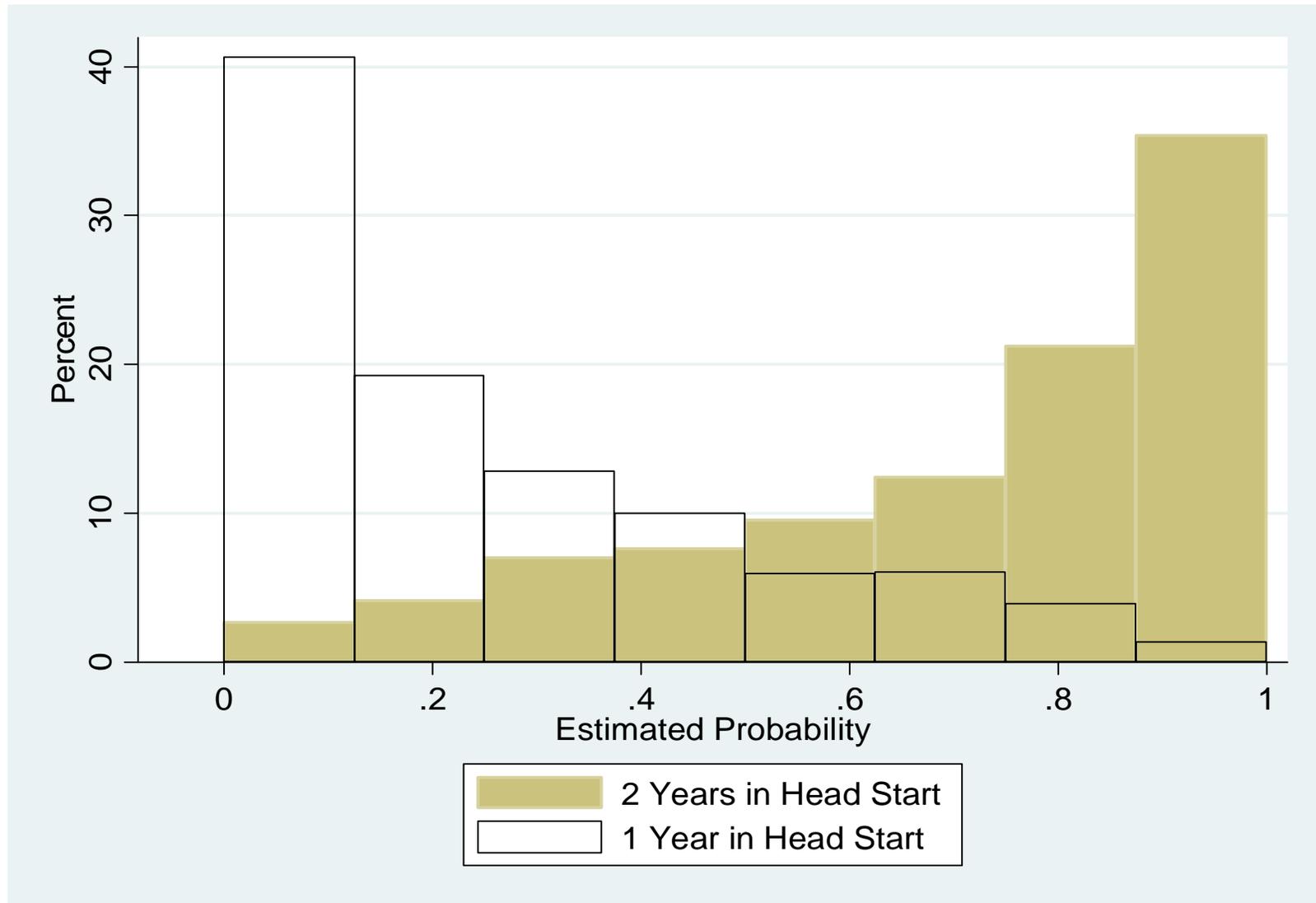
- **Measure: Parent reports of number of hours per week child currently attended the program (for all datasets)**

- **Results: Linear association with child outcomes**
 - **More hours per week associated with**
 - higher reading scores ($.05 < d < .07$) FACES & SECCYD
 - more behavior problems ($.03 < d < .10$) in FACES (marginally) & SECCYD
 - **More hours per week associated with**
 - higher language skills ($.03 < d < .05$) SECCYD & NCEDL
 - **No evidence of interaction between hours per week and quality**

Analysis 3: Duration in Head Start

- **Data set: FACES 2006**
- **Measure: Enrolled in Head Start for two years vs. one year (i.e., enrolled at age 3 or age 4)**
- **Analysis: Propensity score matching based on 17 covariates**
 - **Child and family characteristics: child race/ethnicity, gender, disability, household language, family poverty ratio, maternal education, employment, and depressive symptoms, household mobility, neighborhood safety**
 - **Pretest scores: pretest standard scores on PPVT-4, WJ Letter-Word Identification, Spelling, and Applied Problems, ECLS-B Mathematics IRT scores, and teacher-reported social skills and problem behaviors raw scores**

Distributions of Propensity Scores for Two-Year Group versus One-Year Group

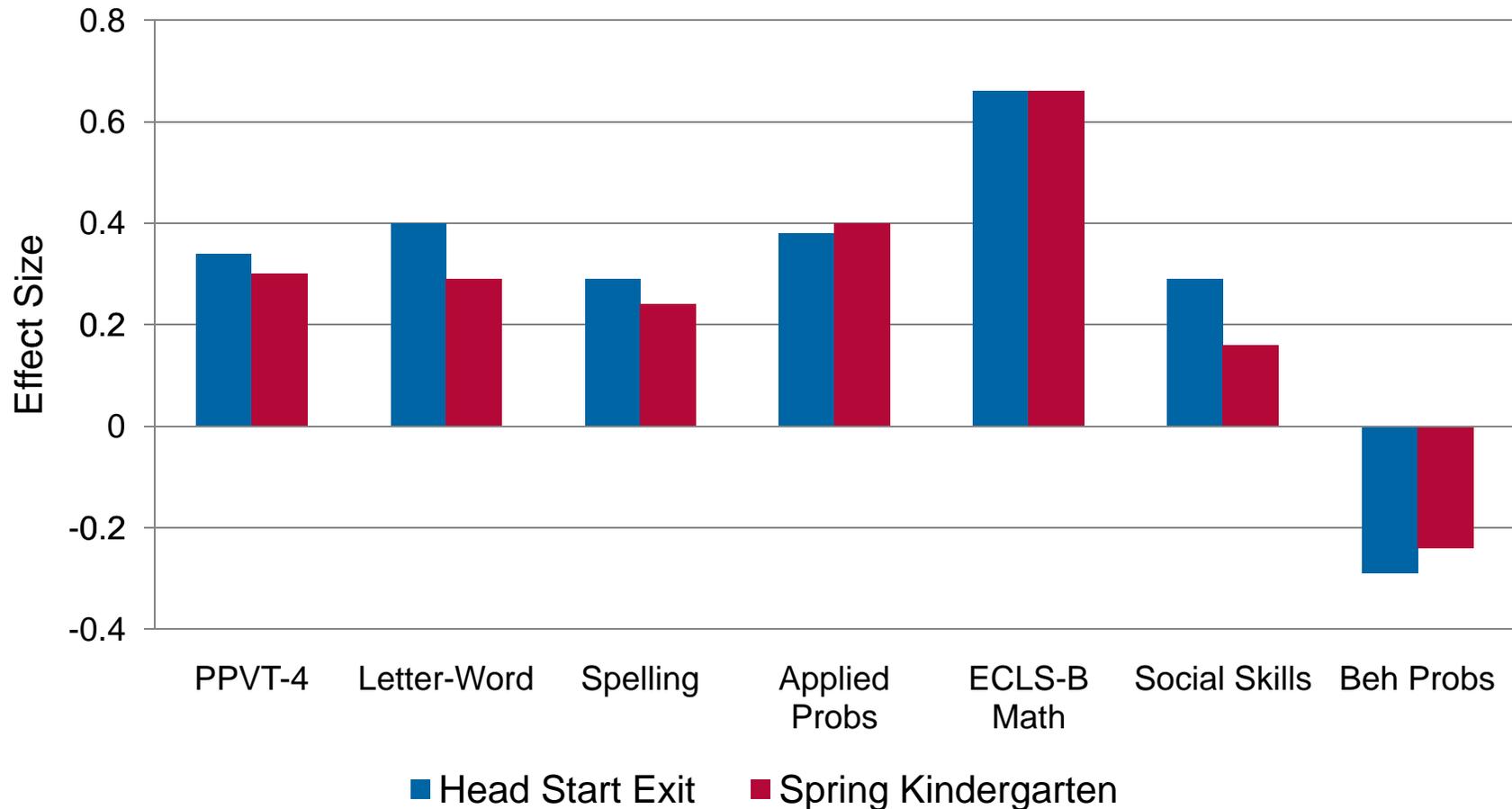


Analysis 3: Duration in Head Start (continued)

- **Sample: ~860 in the two-year group and ~250 in the one-year group who were tested in English**
 - **One-year group children who are not matched**
 - Were more likely to be White or Hispanic, less likely to be African American, and more likely to be DLLs
 - Mothers had a lower level of education and fewer depressive symptoms and were less likely to be employed
 - Had lower standardized test scores on PPVT-4, WJ Spelling, and Applied Problems scores

- **Compared outcomes at Head Start exit and spring of kindergarten**

Analysis 3: Significant effects for 2 v. 1 years of Head Start at HS exit and fall of K



Note: PPVT-4, WJ Letter Word, Spelling, and Applied Problems standard scores are presented.

Conclusions

- **Higher dosage associated with better cognitive outcomes**
- **Results on social-emotional outcomes differ across analyses**
 - Greater exposure to Head Start associated with better social-emotional outcomes
 - More hours of participation per week associated with marginally more behavior problems
- **No evidence of interaction with quality based on instructional time and hours per week analyses**

Conclusions (continued)

- **Findings are only correlational for instructional time and hours per week**
- **The two-year vs. one-year Head Start results generalize to families who are likely to enroll their children in the program at age 3**
 - **More likely to be African American**
 - **Less likely to be White or Hispanic**
 - **Less likely to be DLL**
 - **Mothers tended to have a higher level of education and more depressive symptoms**
 - **Mothers more likely to work**