Do the Effects of Head Start Vary by Parental Pre-academic Stimulation? Results from the Head Start Impact Study

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INTRODUCTION

• Parents and child care programs such as Head Start play key roles in fostering school readiness through pre-academic stimulation and synergistically affect children’s academic achievement.

• There are several competing hypotheses surrounding the differential effects of Head Start and parental pre-academic stimulation:
  - Compensatory: Head Start matters most for children at risk and can compensate for the most disadvantaged home environments.
  - Accumulated Advantages: Children from stimulating home environments are better able to capitalize on the benefits of Head Start.
  - “Goldilocks”: Children from homes in middle ranges of parental pre-academic stimulation are the most sensitive to Head Start.

(Samaroff & Chandler, 1975; Cunha, Heckman, Lochner & Masterov, 2006; Huston et al., 2003)

METHOD

Participants

Data from the Head Start Impact Study (HSIS), a nationally representative sample of 84 Head Start agencies and nearly 5,000 newly-entering, eligible 3 and 4-year olds

Children were randomly assigned to (1) Head Start group that had access to program services; or (2) control group that was not eligible to enroll in Head Start but could enroll in any other early childhood program.

Measures

• Parental pre-academic stimulation:
  - At baseline, primary caregiver asked to report on the use of 10 educational activities. Variables were coded 0 (“no”) or 1 (“yes”). Variables then summed for a total range of stimulation scores from 0 (has done none of these things in the past week) to 10 (has done them all) (r = .71).

• Academic achievement outcomes:
  - At baseline and 1 year later, children were administered a battery of assessments including the WJ Letter-Word test, the WJ Applied Problems test, and the PPVT. All 3 are norm-referenced (M = 100, SD = 15).

• Covariates:
  - Child and family characteristics as well as a lagged DV for baseline level of achievement.

Procedure

• Most flexible equation specification treated parental stimulation as categorical, with dummy variables for different levels of stimulation: high (top 10%), low (bottom 10%, N = 369), & middle (mid 80%, N = 2,290).

• Interactions created by crossing high and low pre-academic stimulation with treatment.

• \( Y = \beta_0 + \beta_1X + \beta_2(HIGH STIMULATION) + \beta_3(LOW STIMULATION) + \beta_4(TX) + \beta_5(HIGH STIMULATION \times TX) + \beta_6(LOW STIMULATION \times TX) + \gamma COVARIATES \)

RESULTS

RESEARCH QUESTIONS

1) Are there main effects of parental pre-academic stimulation and Head Start, respectively, on each of the 3 academic achievement outcomes for children in the HSIS after 1 year?

2) Do the achievement effects of Head Start vary by parental pre-academic stimulation? If so, which hypothesis does our data support?

Table 1

<table>
<thead>
<tr>
<th></th>
<th>WJ Letter-Word</th>
<th>WJ Applied Problems</th>
<th>PPVT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Pre-academic Stimulation (Dummy Bottom 10%)</td>
<td>-2.3**</td>
<td>-1.65***</td>
<td>-3.2**</td>
</tr>
<tr>
<td>Middle Pre-academic Stimulation (Dummy 10-90% - REFERENCE)</td>
<td>(0.70)</td>
<td>(0.89)</td>
<td>(0.83)</td>
</tr>
<tr>
<td>High Pre-academic Stimulation (Dummy Top 10%)</td>
<td>0.82</td>
<td>3.17*</td>
<td>0.49</td>
</tr>
<tr>
<td>Treatment</td>
<td>(0.74)</td>
<td>(1.39)</td>
<td>(0.76)</td>
</tr>
<tr>
<td>(Dummy Assignment to HS)</td>
<td>2.55**</td>
<td>3.17**</td>
<td>1.45**</td>
</tr>
<tr>
<td>Low Pre-academic Stimulation x Treatment</td>
<td>-2.31</td>
<td>3.57*</td>
<td>-0.14</td>
</tr>
<tr>
<td>Middle Pre-academic Stimulation x Treatment</td>
<td>(1.36)</td>
<td>(1.58)</td>
<td>(0.80)</td>
</tr>
<tr>
<td>High Pre-academic Stimulation x Treatment</td>
<td>-3.64*</td>
<td>-0.41</td>
<td>-2.59**</td>
</tr>
<tr>
<td>Intercept</td>
<td>88.23</td>
<td>89.95</td>
<td>88.09</td>
</tr>
<tr>
<td>N</td>
<td>3291</td>
<td>3291</td>
<td>3264</td>
</tr>
</tbody>
</table>

\( R^2 = 0.39, 0.39, 0.31, 0.31, 0.56, 0.57 \)

DISCUSSION & IMPLICATIONS

• Differential effects of Head Start varied by achievement outcome:
  - WU Letter-Word — treatment effect of Head Start was greatest in middle ranges of parental pre-academic stimulation as opposed to high or low ends (“Goldilocks”).
  - WU Applied Problems – treatment effect of Head Start was largest for children with low parental pre-academic stimulation as opposed to everyone else (compensatory).
  - PPVT – did not support any of the hypotheses, but strongly supported resiliency.

• For control children, higher parental stimulation is a protective factor providing resiliency in children not assigned to Head Start (Rutter, 1987).

• Match between parental stimulation and child care arrangements:
  - Interplay between parenting and Head Start on development of early skills.
  - Head Start must be available to children whose parents cannot provide high pre-academic stimulation.
  - Children’s achievement will likely benefit from programs targeted at helping parents increase their pre-academic stimulation capabilities.

Figure 1a and 1b: Figure 1a. Model fit for the WJ Letter-Word test, consistent with a Goldilocks pattern.

Figure 2a and 2b: Figure 2a. Model fit for the WJ Applied Problems test, consistent with a Goldilocks pattern.

Figure 3a and 3b: Figure 3a. Model fit for the PPVT, supporting higher parental stimulation as a protective factor.