Strengthening Family Engagement and Program Quality for Young Children’s School Readiness: A University-District Partnership in Support of Pre-K for All

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Work conducted collaboratively with C. Cybele Raver, Elise Cappella, Natalia Rojas, & Rachel Abenavoli (and thanks to Laurie Brotman)

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Overview

• Building from neuroscience, income, and policy research, developing new models of applied science

• Leveraging this new model to support historic expansion of high quality Pre-K for All in nation’s largest urban school district (NYC)

• Initially:
  – Innovative approaches to systems-building by providing better data + a “dashboard” for decision-making and
  – Building infrastructure to align quality with research-based practice

• Now:
  – Developing plans to study differentiated professional learning

• Goal to build science that is the “next stage” in efficacy to effectiveness, and thus more closely tied to practice/policy
Why should we intervene early?
Leveraging Advances in Neuroscience

- Brain architecture begins to develop very early in life
- Higher-order cognitive processes are built from early skills in the first year (and before) and form the basis for later learning

Neuronal synaptogenesis and pruning by age


Sensory Pathways (Vision, Hearing)
Language
Higher Cognitive Function

What are the challenges of being low-income?
Income-Based Achievement Gap has Grown and Persists (despite declining race-based gap)

Estimated Gaps in Reading Achievement Between High-Low Income (90/10 Ratio) and Black-White Students, by Birth Year, 1940-Present.

[Scores are drawn from 23 Studies of children from ages 3 to 18 in grades pre-K to 12th; see Table 5.A1 of online appendix @]

But, much of the income gap in achievement is already present at school-entry, so early investments matter.
What evidence do we have that early childhood programming can address income-related gaps?

- **Preschool education has shown short and long-term gains** (Barnett; Bartik; Gormley; Heckman; Karoly)
  - **Older demonstration programs:**
    - Perry Preschool Chicago Parent-Child Centers (benefit-cost ratios of 7 to 1 or higher)
    - Abecedarian (longer 0-5 program): 2.5
  - **Benefits of Head Start** (esp for those children who otherwise would have been cared for at home and where counterfactual is weaker)
  - **More recent evidence from at-scale public preschool:**
    - Benefit-cost ratio of Tulsa prekindergarten program: between 3 and 5 to 1; including robust ratio for non-poor children
    - Also, positive findings from Boston (next slide)
Positive impacts of Head Start for “home compliers”
(Feller, Grindal, Miratrix, & Page, 2016)
Positive impacts of Boston Pre-K on language and math (as well as executive function) (Weiland & Yoshikawa, 2013)

The implication is that Boston’s pre-k cuts in half the reading gap.
Can we improve the quality of early education and make a difference for children?

- Rigorous studies show that preschool enhancements/curricula can produce changes in child outcomes
  - Language/literacy (e.g., Dialogic Reading; OWL; Literacy Express)
  - Math (e.g., Building Blocks; Pre-K Mathematics)
  - Social-emotional/self regulation (e.g., ParentCorps; Chicago school readiness project; PATHS; Incredible Years)

- Most promising recent evidence suggests high quality is a combination of:
  - Developmentally focused instruction/curricula (focused on particular skills or combinations of skills – e.g., language/literacy, math, social-emotional skills)
  - Intensive on-site or video-based professional development (mentoring/coaching, often with frequency of >= 2X a month)
  - **PLUS, family engagement**: Early childhood education cannot be high quality (i.e., effectively support children’s early learning) without effectively engaging families.
ParentCorps (Brotman et al)

• Creates a family-centered intervention that would be broadly available, engaging and effective for low-income, culturally diverse families

• Universal enhancement to pre-k (maximize reach and acceptability)

• Embedded in schools and facilitated by school staff (sustainability)

• Timed with the transition to school (parents are open and motivated)

• Multiple components (home & classroom)

• Group-based (build social capital and create a parent “corps”)
Parent Corps (Brotman et al)

IES-funded trial and three follow-up studies (IES, NIMH: Brotman; 2005 – 2017)

- Brotman et al. (2013). *Pediatrics*.
- Dawson-McClure et al. (2014). *Prevention Science*.
- Brotman et al. (2016). *JAMA Pediatrics*.
ParentCorps Impact on the Classroom Environment and Family Engagement

Magnitude of Effect (Cohen’s d)

- Positive & Negative Climate
- Behavior Management
- Productivity
- Proactive Strategies
- Positive Reinforcement
- Family Engagement Efforts

Comparison across:
- Class
- Teacher Report
- Parent Report

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ParentCorps Impact on the Home Environment

Magnitude of Effect (Cohen's d)

- Knowledge of Evidence-Based Strategies
- Proactive & Positive Reinforcement
- Involvement in Learning (Teacher Report)
- Involvement in Learning (Parent Report)
- Effective Behavior Management

HIGH-RISK FAMILIES

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ParentCorps Impact on Foundational Skills in Pre-K and Kindergarten and Academic Achievement, Mental Health & Physical Health through 2nd Grade

Magnitude of Effect (Cohen's d)

- **Reading Test**: 0.3
- **Academic Performance**: 0.3
- **Social-Emotional Skills**: 0.2
- **Social-Emotional Skills**: 0.2
- **Mental Health Problems**: 0.4
- **Body Mass Index**: 0.6

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Taking what we know from studies to the practice in New York City

- We have served as PIs/Co-Is on RCTs in Chicago, Newark, New York City, and nationally (CARES)
- So, we know that some programs “work” and preschool “matters”….NOW WHAT?
  - While RCTs are an important foundation, they are rarely taken up as is...
- Timeliness and misalignment are major impediments to take up
  - At this rate, will not make major dent on reducing educational disparities in a timely way
- Shifting priorities to emphasize use of research design, data, and analysis to support partnership, decision-making as 1st priority, answering research questions as 2nd priority
  - “Rapid response” data collection, analysis and interpretation
  - Use of data and questions built into educational practice
Launch of the Partnership (Spring 2014)

- City announced commitment to launching major expansion in Pre-K
- We met as consortium of IHDSC-linked faculty, discussed possibilities of collaborating and offering expert technical assistance to City in face of UPK rollout.
- Set up meeting with City (faculty as “reps” of the IHDSC-linked faculty consortium)
  - Emphasized the need for linking, building “research architecture” for UPK as way to capitalize on/identify successes and to mitigate risks during such rapid transition.
- City welcomed partnership, with ask that we raise resources to do so
  - Raised seed money from IES, Spencer, and NYU
In the meantime....

- City successfully identified and licensed new sites, expanded existing sites for UPK delivery
- Hired and trained teacher workforce through CUNY
- Enrolled approx 50K children into UPK for September start in 2014 (see next slide)
- Put out an RFP for $2M evaluation
  - Westat was awarded the contract
Pre-K for All: Access to free, full-day, high-quality pre-K for every NYC four-year-old

<table>
<thead>
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<th>2013</th>
<th>2014</th>
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<tbody>
<tr>
<td>Students</td>
<td>19,000</td>
<td>53,000</td>
<td>68,500</td>
</tr>
<tr>
<td>Programs</td>
<td>560</td>
<td>1,350</td>
<td>1,850</td>
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</tbody>
</table>

**Before Pre-K for All**

- Students: 19,000
- Programs: 560

**With Pre-K for All**

- Students: 68,500
- Programs: 1,850
Phase 1: For evidence-based decision-making, Pre-K for All leaders needed easy-to-collect, quick-turnaround, reliable data

- Purchased tablets, loaded software from Jelena Obradovic
  - Adapted Obradovic’s Hearts & Flowers measure of Executive Function
  - Provides valid assessment but lowers error rate and assesses response time
  - Expedited data entry, data upload
- Android programmer hired to develop versions of:
  - Adapted Woodcock-Johnson subtests, including letter-word id, vocabulary, and applied problems.
Phase 1: Using Data Visualization to Support DOE’s Efforts

Legend
- PKA sites
- Median Income
- < $18,690
- $18,690 - $39,478
- $39,479 - $65,065
- $65,966 - $110,941
- > $110,942

Pre-K for All Sites by Median Income of Census Tracts
Phase 2 of the Partnership: Co-developing Research Plans to Study Differentiated Professional Learning

- City wants to understand how its system of professional learning supports program quality and helps sites meet their “Program Quality Standards”

- We are currently working with the city to:
  - Study these system
  - Develop new tools to measure impact
  - Embed opportunities for ongoing rigorous evaluation
Pre-K for All Differentiated Professional Learning

- All Pre-K for All Sites:
  - Are assigned to a “track” and participate in track-specific PL sessions
  - Receive on-site coaching by a DECE instructional coordinator or social worker, with type and dosage differentiated according to need
  - Receive ParentCorps evidence-based family engagement supports
Pre-K for All Tracks & Professional Learning System

**Explore**
- Teachers are trained to implement Building Blocks (evidence-based math program) + Interdisciplinary Units of Study
- Specialized BB coaches provide on-site coaching
- Sites receive materials to support implementation

**Thrive**
- Teachers and leaders learn evidence-based practices to foster family engagement and children’s social, emotional, and regulation skills
- A subset of sites also receive coaching and tools to implement ParentCorps (evidence-based family program)

**Create**
- Teachers and leaders are trained to incorporate visual arts, music, dance, and theater into classroom activities and instruction
- Sites receive toolkits that include art supplies, books, and instruments

**Inspire**
- Sites select from a menu of topics aligned to Program Quality Standards (e.g., authentic assessment, creating a positive climate)
- Teachers attend trainings tailored to site need and interest

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NYC Pre-K Thrive: Three “tiers” to support services within system constraints

**Tier 1**
All PKFA programs during all 3 years

**Tier 2**
Year 1: 115 programs  
By Year 3: 350 programs

**Tier 3**
Year 1: 21 programs  
By Year 3: 50 programs
How can we now study Thrive, Explore, and the other models within the existing system: some examples

Continued descriptive work, but paired with:

• Finding “natural experiments” within assignments (to study Explore track)

• Using existing processes to create some experiments within the system
  – Two examples:
    • Randomization of programs
    • Randomization of children

• Goal: to provide city with information about the differing effects of distinct tracks for teachers, classrooms, and children
Uncovering a Natural Experiment

DOE developed two scenarios:

- **Scenario A**  
  - Explore Funding
  - Thrive
  - Create
  - Inspire
  - Explore

- **Scenario B**  
  - No Explore Funding
  - Thrive
  - Create
  - Inspire
  - Explore

**Explore funding secured**

- Thrive & Create sites stay in track
- Inspire sites given option to switch to Explore
- Too few to include
- Natural experiment didn't want to switch sample

Sites assigned & notified assuming no funding

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Randomizing of Programs to Tracks
Balancing opportunity for rigorous evaluation with **site preference**

- Can’t count on another natural experiment happening by chance
- We worked with the city to embed some randomization into the process of assigning sites to tracks to enable rigorous *future* research

Sites rank track preferences

<table>
<thead>
<tr>
<th>Site</th>
<th>Inspire</th>
<th>Explore</th>
<th>Thrive</th>
<th>Create</th>
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<tbody>
<tr>
<td>Site A</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>Site B</td>
<td>2</td>
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<td>Site F</td>
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<tr>
<td>Site G</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

DOE selects sites that ranked Thrive/Explore & Inspire #1 & #2 (in either order)

Randomly assign

Explore/Thrive

Inspire

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Leveraging randomization of children to programs
Balancing opportunity for rigorous evaluation with student choice

- Pre-K Application System
  - On pre-K application, families can list 12 pre-K sites in order of preference
  - Sites have “priorities” for each child
Leveraging Naturally-Occurring Student “Lotteries”

- At oversubscribed sites, children are assigned to site by lottery-like process
- Lotteries occur within groups with the same site preference and priority group
- Thus, “winners” and “losers” within a block (i.e., lottery) are equivalent in expectation and mean differences are valid estimates of the causal impact
- Similar methodology used to evaluate impacts of small high schools of choice (Bloom & Unterman, 2014)
How do the lotteries provide opportunities for studying the effects of PD tracks?

Applicants by Priority Group

Priority 1 (20 applicants)
- All 20 placed at site

Priority 2 (40 applicants)
- LOTTERY: 15 winners
- 25 losers

Priority 3 (10 applicants)
- All 10 placed elsewhere

Preferred Site (35 seat capacity)
- Thrive

Less-Preferred Sites
- Inspire
- Explore
- Create

LOTTERY:
- 15 winners
- 25 losers

All 10 placed elsewhere
Summary

- Family engagement is an important component of early childhood quality programming and key to reduce achievement gap
- But, we need to eliminate barriers to widespread deployment of what works – bridge the gap from micro intervention to macro policy
  - RCTs were important to build the foundation of what works
  - BUT, there is a limit to how far such research can take us in informing policy at scale
- Research-practice partnerships provide an opportunity to “move the dial” on the achievement gap by building programs at scale that are sensitive to the constraints & opportunities of the system.
  - BUT they are not easy: require shift in style of work for both academics and agency leaders
- **NOW is the time:**
  - Federal and private funders are supporting these efforts
  - Academics are increasingly interested
  - Agency leads are open this kind of work
  - And, of course, the needs of low-income children are still very real
THANKS to....

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