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K-8 Programs to Reduce the Intergenerational Transmission of Poverty: A Review

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**Prepared for presentation at University of Wisconsin Conference
Promising Programs to Reduce the Intergenerational Transmission
of Poverty: Research on the Early Years of Life**

April 23, 2016

The Problem (Duncan and Magnuson, 2011)

- Children from the lowest SES quintile begin kindergarten more than 1SD lower than children in the top SES quintile in both reading and math.
- They are about 0.60SD below children in the top SES quintile in academic work habits.
- They are about 0.25SD higher than children in the top SES quintile in antisocial behavior.
- These gaps either remain unchanged or increase as students move through their schooling careers.

Possible Tools to Close the Gaps

- Preschool and kindergarten interventions -- to reduce achievement gaps at the very beginning
- Instructional innovations and interventions
- Social and emotional learning programs
- Summer instructional programs
- Accountability and Choice

Possible Tools to Close the Gaps

- Supplemental Educational Services, particularly after school tutoring.
- Intensive tutoring during the school day.
- Whole School Reform, including charter schools, comprehensive programs, and complete reorganizations.

Preschool and Kindergarten Programs

- Head Start effects too small, and none persist. 0.1SD (Puma et al.). HS uses ineffective curricula. Improving the instruction delivered by Head Start is a major issue.
- State Pre-K Potentially More Effective than Head Start. But effectiveness uncertain. Yes in Oklahoma (Gormley et al.), No in Tennessee, particularly beyond the end of treatment (Lipsey, Farran, and Hofer, 2015).

- Chicago Child-Parent Centers (Reynolds et al., 2002) for children ages 3-9. Positive cost-benefit. But this age range overlaps with Head Start and regular school, and these programs unlikely to be funded at scale.
- Boston Pre-K (Weiland and Yoshikawa, 2013). Effective at end of pre-K, perhaps because used Building Blocks and OWL Curricula. But still need to worry about fade out.

- Full Day Kindergarten: For literacy, $d = 0.31SD$ (Gibbs, 2014, lottery data). Larger effects for Hispanics ($d = 0.7SD$) and low performers. This should be part of a solution. But already 70% of kids are getting this (ECLS: 2011).
- Double Dose Kindergarten (Holub, 2016): Letter word ID, $d = 0.50SD$; Phonemic awareness $d = 0.31SD$; Applied Problems, $d = 0.25SD$. Transitional kindergarten already exists widely. Some version of extra kindergarten for kids who need it should be part of any solution.

- This may come down to using effective curricula such as Building Blocks and OWL.
- However, Building Blocks has an effect of 0.7SD in kindergarten and yet by third grade the effect is completely gone.
- The problem is alignment of pre-K and K+ curricula, and inability of teachers to differentiate instruction to kids with and without the pre-K boost.

- Certainly effective preschool and kindergarten programs for low-income children should be part of the overall strategy to achieve our goals.
- But we need effective pre-K based on well-implemented proven curricula.
- Universal pre-K so that K-3+ curricula can take advantage of the pre-K gains
(or)
- Training K+ teachers to differentiate instruction depending on where the child is starting from.

- Effects on early achievement need to be large, and lead to a **cascade of positive events that prevent fade out.**
- This is becoming a major theme – one or two year interventions produce effects that fade out.
- Really effective interventions are likely to be multi-year and have a mechanism to catch up students who fall behind in later years.

- But some say we don't even know how to run effective preschool programs at scale.
- Farran (2015) summarizes preschool research:
 - “Lack of evidence about which skills and dispositions are most important to effect in pre-K, and what instructional practices would affect them.”
 - “None of the widely used measures of classroom and center quality relate strongly, if at all, to child growth on the school readiness outcomes on which most pre-K programs are focused.”

Conclusions Re Pre-K and K

- Narrowing achievement gaps at school entry is important.
- We have curricula capable of doing so, but they are not widely used.
- The largest program -- Head Start doesn't use them, and must be improved or replaced.
- Even if we achieve good sized effects, we have to worry about later fade-out.

Instructional Innovations and Interventions in Grades 1-8

- We have had the Reading and the Math wars.
- The peace treaty for reading called for a combination of phonics and whole language in the early grades. Unfortunately, the whole language curricula put in phonological exercises but didn't always use decodable text books. This disadvantages lower performers.
- Also, unfortunately, phonics instruction, while effective with beginning readers, has failed to improve comprehension for older readers. Research suggests we also need to work on oral language for these students.

- The math war is still in progress. I fear that constructivist math is winning. There is little valid evidence that it is effective. Direct or explicit instruction is generally best for low performers.
- Building Blocks (Clements/Sarama) preschool math curriculum produces very large effects (0.7) after one year. But they fade out to zero by 3rd grade.

- Positive effects for individualized reading instruction in K-3 (Connor et al., 2013).
- Algebra for All, Double Dose Algebra – mixed results (Cortes et al., 2015; Domina et al., 2015). But the Cortes study suggested the importance of “staying on track” in high school.

- Cohen and Ball (2000) summarized studies by saying that “instructional innovations generally fail.” For several reasons:
 - Inadequate teacher professional development and implementation.
 - Teachers typically use only selected elements of the designed intervention.
 - Variability in portions that teachers adopt
 - Rapid turnover of innovations.

Conclusion: There is little evidence that innovations in K-8 classroom instruction alone will solve the problem.

Social and Emotional Learning Programs (SEL)

- Durlak (2011) reviews evidence.
- Academic Performance $ES = 0.27SD$. Possibly due to tutoring. Not large enough to close even half the gaps.
- Fast Track intervention has positive effects for those most at risk (Dodge et al., 2007).
- Effects modest, programs not at scale, fade out of effects is likely.

Conclusion: SEL Interventions Added to Routine Schooling Unlikely to Solve Problem

Summer Instructional Programs

- Kim and Quinn (2013) summer program effects meta-analysis overall mean ES of $d = 0.10SD$ for total reading achievement.
- Significant positive effects for reading comprehension, fluency, decoding. No significant effects for reading vocabulary. Overall, positive effects are attained, but not very large.

- Some evidence that the effects are simply to reduce or eliminate summer loss. But this suggests relatively quick fade out during school year.
- Summer programs might be part of an overall strategy but unlikely to contribute a great deal.

Conclusion: Summer Programs are unlikely to have large enough effects to contribute much to solving the problem.

Accountability

- Mixed evidence on the effects of NCLB accountability on achievement and narrowing gaps.
- Dee and Jacob (2011) find positive effects. So do Ahn and Vigdor (2014). Claim that school management is key.
- But Reardon et al. (2013) say that achievement gaps were already narrowing when NCLB began. Not clear that NCLB made any difference (Reardon et al., 2013).

Conclusion: Unlikely that accountability alone will achieve the goal.

Supplemental Educational Services (SES), particularly after-school tutoring

- Under NCLB, school districts fund these with their Title I funds.
- After school tutoring is not usually implemented well. Difficulty assembling kids after 3:00, settling them down, engagement. Kids are not in mood. Only 2 hours or so available after school. Typically provides too few total contact hours per student over the school year.

- Mathematica study of 21st Century after school tutoring (James-Burdumy et al., 2005) found no effects on achievement. Some negative effects on behavior.
- Heinrich et al. (2014), Deke et al. (2014) and Farkas and Durham (2007) found little evidence of positive achievement effects as SES is currently implemented.

Conclusion: Not likely to be very helpful. SES are a candidate for saving money to put it where it may be more effectively spent. Tutoring during the school day is potentially more effective (see below).

Intensive and Extensive, Structured, Very Small Group Tutoring During the School Day

- One-to-one reading tutoring has been shown to be effective when enough sessions (more than 60) are delivered (Wasik and Slavin, 1993; Farkas, 1998).
- Jens Ludwig and others (Cook et al., 2015) have shown that 2:1 math tutoring can be effective with tutors who are elite college graduates paid a \$19K stipend for 10.5 months work.

- This program concept was developed by Match Charter Schools in Boston which has spun off a company called SAGA to deliver these services in other cities.
- Roland Fryer showed success with SAGA tutors in Houston.
- Ludwig, Guryan and others brought SAGA to Chicago to implement an RCT in 12 very low income Chicago schools.
- TOT effect estimates on a math achievement test are about 0.3SD; on math grades about 0.5SD, and reduced math course failures by half.
- Costs of \$3800/participant (down to \$2500/participant if delivered at scale).

- Students receive up to 150 hours of individualized math instruction each school year.
- Guryan, and Ludwig propose to implement programs of this sort nationwide, using Title I funds.
- Aimed at students in grades 3 – 10.
- **Conclusion:** Such 2:1 tutoring during the school day, every day for a total of perhaps 150 hours per school year, for students below grade level from K – 12, could play a significant role in narrowing achievement gaps and other positive outcomes.
- Continuous intervention, for those who need it, at all grade levels, might remove the fade out problem.

Whole School Reform

Success for All (Slavin and Madden)

- The entire district signs up. Focus on professional development, early reading instruction, cooperative learning, reading tutoring by teachers after school. Includes a family support team.
- Borman (2002) finds that after 4 years in the program, an effect of 0.25SD in reading. No special effort to raise math scores.

**Conclusion: Modest effects, expensive program.
Helpful, but not the solution.**

Charter Schools in General

- Their quality varies greatly.
- Clark, Gleason, Tuttle and Silverberg (2015) used lottery data from 33 charter middle schools across 13 states. No significant difference in achievement, although positive impacts for more disadvantaged schools and students.
- Epple, Romano, and Zimmer (2015) broadly reviewed the literature and found no average difference in achievement.
- However, some charters are very effective.

Small High Schools

- Bloom and Unterman (2014) found that small high schools of choice in NYC, after learning from experience, increased graduation rates for disadvantaged students by 9.5 percentage points.
- This closes $\frac{1}{2}$ the Black-White graduation gap. So these schools may well be part of the solution.
- It also raises the point that test scores aren't everything.

“No Excuses” Schools

- A culture of college-going and high expectations
- Strong disciplinary and dress codes
- A longer school day and/or school year
- Targeted instruction for students who fall behind their peers

- These schools enroll a very high percentage of low income and minority students, and have an intense focus on reducing achievement gaps.
- Cheng, Hitt, Kisida and Mills (2015) perform a meta-analysis of lottery studies of their effectiveness. These include well known studies by Angrist, Fryer and their colleagues.
- They estimate gains of 0.25SD on math and 0.16SD on literacy for winners of the lottery in one year of attendance.

- These estimated effects, which presumably would apply every year as students move up the grades, **seem the most promising of all the options reviewed.**
- These schools use tutoring during the school day for those falling behind, which is consistent with the findings and suggestions of Ludwig and Guryan for every school to have intensive structured tutoring available during the school day at all grade levels for students who have fallen far behind.

- KIPP Schools are an example of a large and growing network of no excuses charters that have shown good-sized effects (papers by Angrist et al. and the Mathematica group).
- **I suggest as most promising: An effort to implement the attributes of KIPP schools as widely as possible in schools serving low income students.**
- **A major research question: The sustainability and scalability of this strategy.**

Other than program evaluation, what research would be most useful?

- Research on program effect fade out and how to prevent it.
- This means understanding achievement growth trajectories and how they are related to details of instruction at each grade level.
- This should examine trajectories of course grades as well as test scores.

- It also means understanding how and why later important outcomes such as high school graduation or college entrance are related to trajectories of test scores, course grades, and ***other variables***.
- ***These are black boxes that need to be opened.***

THANK YOU