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BUILDING KNOWLEDGE TO IMPROVE SOCIAL POLICY

POLICY BRIEF

Preschool to Third Grade Alignment

What Do We Know and What Are We Learning?

By Meghan McCormick, Shira Mattera, and JoAnn Hsueh

Over the past few years researchers, policymakers, and practitioners have become increasingly supportive of "preschool — third grade alignment."[1] The concept refers to the range of policies and practices designed to put children from birth to age eight on a positive developmental pathway that takes what they have learned in preschool and builds on it through the early elementary grades.[2] This shift in the early childhood field reflects growing evidence that investments in preschool may be critical but insufficient to close persistent achievement gaps in the longer-term.

Achievement gaps in reading and mathematics are pronounced between children from divergent socioeconomic backgrounds They emerge before children even begin kindergarten.[3] In response to evidence showing the substantial benefits of preschool on early learning and development, as well as longer-term gains in adulthood, public support for increasing the availability of high-quality public preschool in the United States is at an all-time high. A wave of cities and states — including Seattle, New York, Texas, Boston, and Georgia — have made major investments to dramatically expand and improve the quality of and access to publicly-funded preschool programming.[4] Yet, a number of studies have found that the short-term impact of preschool on children's cognitive outcomes *fade out* as children progress through elementary school.[5] This fadeout pattern has drawn greater attention to student experiences *after* preschool and helped increase support for policies and programs to improve "preschool — third grade alignment."

As the early childhood field moves towards creating more integrated educational systems, MDRC is engaged in two large-scale multiyear projects to build rigorous evidence about the promise of alignment between preschool and elementary school for sustaining early gains in learning. In **Expanding Children's Early Learning from P-3 (ExCEL P3)**, MDRC is working with the Boston Public Schools (BPS) Department of Early Childhood, the University of Michigan, and the Harvard Graduate School of Education to describe and evaluate a district-wide curriculum and professional development model to align instruction from preschool to second grade. In **Making Pre-K Count/High 5s** (**MPC/High 5s**) MDRC (in partnership with Robin Hood) is working with the University of Michigan and the University of Denver to evaluate and inform work on a curriculum that aligns math instructional practices across preschool and kindergarten. Both projects will provide new information about *whether* and *how* aligned educational experiences improve children's outcomes as they move through their early school years. In this brief, we review the state of knowledge that is informing this work and

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highlight how our current research will add new insight to this critical aspect of early education policy and programming.

WHAT IS INSTRUCTIONAL ALIGNMENT AND WHY IS IT IMPORTANT?

The K-12 education field has long considered the importance of instructional alignment.[6] Alignment has typically been conceptualized as encompassing standards, curricula, and assessments that build on one another over time.[7] Yet, it is only in the past decade that preschool has been integrated into the formal educational pipeline. Few administrators or researchers to date have examined how children's experiences before and after their transition to kindergarten are aligned, or not. MDRC is working with partners to fill this knowledge gap by examining efforts to support vertical alignment, or the extent to which instructional content appropriately builds in complexity from preschool to third grade. Box 1 highlights aspects of vertical alignment that MDRC is exploring in the **ExCEL P3** and **MPC/High 5s** studies.

Although aligning instruction across years makes intuitive sense, current research suggests that it is relatively rare for young children to be taught in this way as they move from preschool to early elementary school.[8] Teachers in the elementary grades report spending substantial instructional time on skills most children have already mastered before kindergarten.[9] In addition, instructional learning formats are inconsistent across the early grades. Preschool students spend the majority of their time engaged in centers and small groups, which promote child-directed and differentiated, or individualized, learning.[10] Children then transition to kindergarten where they spend the bulk of their time in whole group instruction and individual seatwork.[11] In the **MPC/High 5s** study, the research team observed that 83 percent of math instructional time in kindergarten was spent in whole group settings compared to 26 percent of time in preschool classrooms.[12]

MDRC has been able to systematically study alignment because of partnerships with school districts that are directly addressing these challenges — Boston for **ExCEL P3** and New York City for **MPC/High 5s**. These partnerships have informed MDRC's understanding of the significant challenges that districts must address as they continue to integrate traditional early childhood education into their formal educa-

BOX 1. FEATURES OF VERTICAL ALIGNMENT

This brief defines instructional experiences as vertically aligned when instruction focuses on the following elements:

1. Foundational early math and literacy skills in preschool (e.g., letter recognition, cardinality as well as more complex skills such as vocabulary, comprehending texts, and geometry);
2. Sequentially more challenging tasks and concepts across elementary school.

tional system. The discussion below examines the lessons learned from instructional alignment efforts that have either been developed by districts themselves or co-constructed and put into practice by schools, curriculum developers, and researchers.

TWO APPROACHES TO PROMOTING INSTRUCTIONAL ALIGNMENT FROM PRESCHOOL – THIRD GRADE

MDRC's first set of insights about alignment stems from a large-scale evaluation of the evidence-based preschool math curriculum Building Blocks in New York City, a project called **Making Pre-K Count (MPC)**. MPC is the result of a partnership between Robin Hood, one of the country's leading antipoverty organizations based in New York City, and MDRC.[13] Additional funding was provided by the Heising-Simons Foundation, the Overdeck Family Foundation, and the Richard W. Goldman Family Foundation. The study was designed to understand whether an increase in children's math and executive function skills in early childhood — through an enhanced preschool math curriculum and professional development training for educators — could continue to affect the academic achievement of young children as they moved through elementary school. Concerned about growing evidence that preschool impacts in other domains tended to fade, MDRC partnered with the University of Michigan and the University of Denver to develop aligned kindergarten math activities, called **High 5s,** to continue to expose children in kindergarten to the high-quality instructional practices and rich content they received in preschool. Box 2 summarizes the core components of the **High 5s** program and how it is aligned with **MPC**.

BOX 2. HOW ARE MPC AND HIGH 5S ALIGNED ACROSS PRESCHOOL AND KINDERGARTEN?

The Making Pre-K Count program and the High 5s program were aligned across the following components:

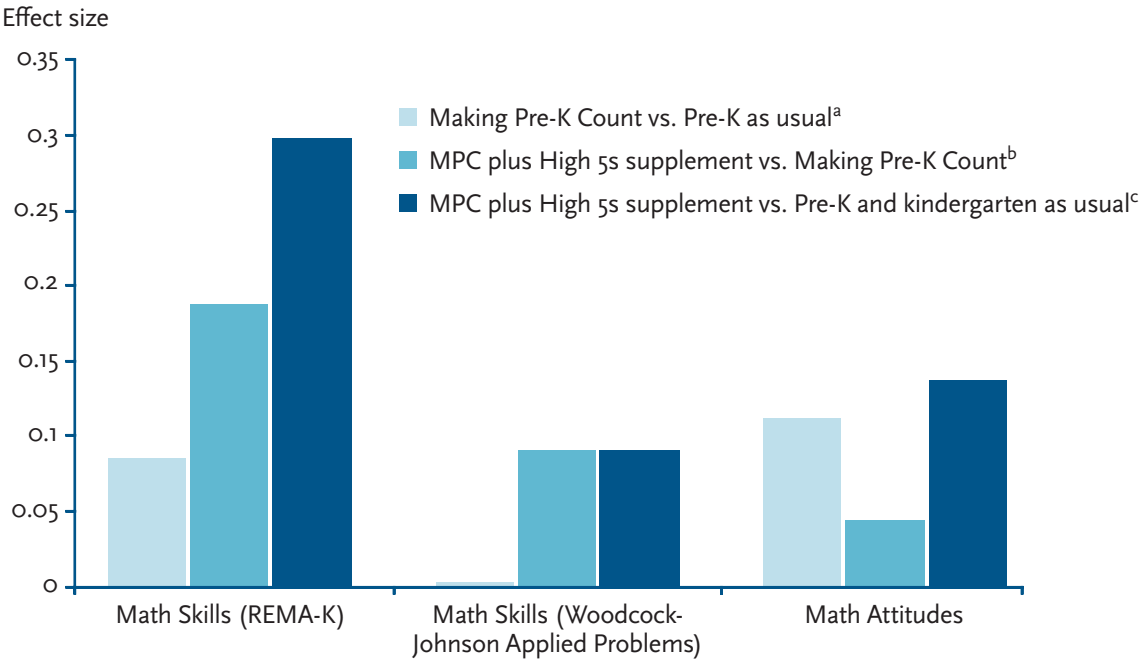
1. **Format of instruction: MPC** activities in preschool took place primarily in ***small groups***. The **High 5s** model then paired three to four children with one facilitator for math clubs that met three times per week for 30 minutes each time.*
2. **Modality of instruction:** MPC activities used tactile materials and ***hands on*** experiences to support children's understanding of mathematical concepts. ***High 5s built*** on the ***MPC*** activities to provide children with engaging, developmentally appropriate learning experiences and materials.
3. **Content of instruction:** The Building Blocks curriculum implemented through **MPC** is a 30-week, evidence-based curriculum designed to take into account children's natural developmental progression in math skills across numeracy, geometry, patterning, and measurement.† **High 5s** began where Building Blocks left off in the same math domains, building in complexity on what students learned in preschool.‡

*Jacob, Erickson, and Mattera (2018).
†Clements and Sarama (2007).
‡Jacob, Erickson, and Mattera (2018).

As illustrated in Figure 1, students assigned to receive the **High 5s** activities in kindergarten on top of their enhanced preschool math experience had stronger math skills at the end of kindergarten than students who had only received the enhanced preschool math curriculum. This effect was equivalent to 2.5 months of additional growth in math skills. The impact of **High 5s** in kindergarten in addition to **MPC** in preschool compared with typical preschool and kindergarten math practice, produced the same effect as closing over a quarter of the achievement gap between lower-income children and their higher-income peers. Findings demonstrate that high-quality, developmentally-appropriate instructional practices that are aligned and grow in complexity across years can make a meaningful difference for closing the achievement gap.[14]

MDRC's **ExCEL P3** project — funded by Arnold Ventures and the Institute of Education Sciences — concurrently aims to understand the rollout of a model to align curriculum and

FIGURE 1. Impacts of MPC/High 5s in the Spring of the Kindergarten Year, Selected Outcomes



SOURCE: MDRC calculations based on the direct child assessments administered in spring 2016.

NOTES: Effect size is calculated by dividing the impact of the program (the difference between the means for the program group and the control group) by the standard deviation for the control group.

[a]The Making Pre-K Count (MPC) program group received Making Pre-K Count in pre-K. The pre-K-as-usual control group did not receive math enrichment. The effect size for the math attitudes outcome is statistically significantly at the $p < .05$ level. The other outcomes are not statistically significant.

[b]The MPC plus High 5s supplement group received Making Pre-K Count in pre-K and High 5s in kindergarten. The Making Pre-K Count group received only Making Pre-K Count in pre-K. Both groups consist of public school children only. The effect size for the REMA-K is statistically significant at the $p < .05$ level. The Woodcock-Johnson Applied Problems and math attitudes outcomes are not statistically significant.

[c]The MPC plus High 5s supplement group received Making Pre-K Count in pre-K and High 5s in kindergarten. The pre-K-and-kindergarten-as-usual control group did not receive math enrichment. Both groups consist of public school children only. The REMA-K outcome is statistically significant at the $p < .01$ level and the math attitudes outcome is statistically significant at the $p < .10$ level. The Woodcock-Johnson Applied Problems outcome is not statistically significant.

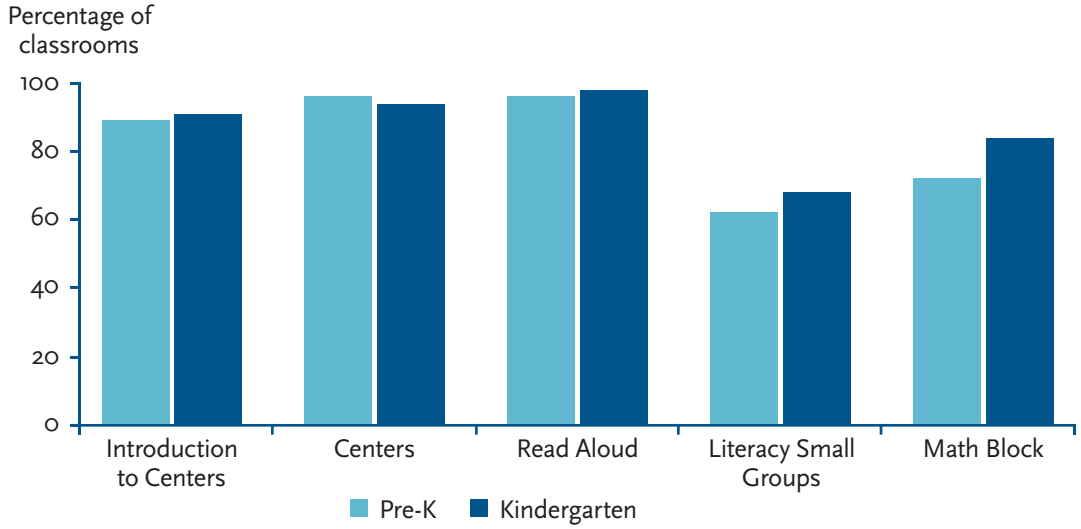
professional development from preschool to second grade that is being implemented in the Boston Public Schools. This approach — called *Focus on Early Learning* — was designed by the school district and adjusts the structure of the early elementary school grades so they more closely mirror child-directed preschool practices such as small groups, and play-based learning.[15] Content builds in complexity across grades but follows a similar set of thematic units. Because the pre-K themes are reintroduced in the higher grades, the content can be expanded in depth and complexity. In this way, instructional alignment can allow for greater richness of content and cognitive demand in the higher grades. The district created *Focus on Early Learning* because they recognized that their well-known, strong prekindergarten program — found to have moderate to large effects on student skills — was largely disconnected from children's experiences in kindergarten through second grade instruction; these grades did not effectively build upon the skills children were learning in early childhood classrooms, potentially reducing the long-term impact of early childhood programming.[16]

MDRC and its partners are currently engaged in a number of study activities to describe the *Focus on Early Learning* model, determine the extent to which classrooms are implementing the model as designed, examine how the approach affects the continuity of children's learning across grades, and test whether *Focus on Early Learning* helps sustain the gains that children make in Boston Public School's prekindergarten program. Although MDRC is in the early stages of this work, findings from observations collected across prekindergarten and kindergarten do suggest that BPS's aligned approach may be improving the continuity in children's learning experiences. For example, MDRC has found that, unlike in other locales, prekindergarten and kindergarten students in Boston are spending similar amounts of time in center-based instruction and small groups for math and literacy. Figure 2 shows the percentage of classrooms in the MDRC study with five core components from the *Focus on Early Learning* curriculum — Introduction to Centers, Centers, Read Aloud, Literacy Small Group, and the Math Block — and how rates of implementation were fairly similar in both prekindergarten and kindergarten. Importantly, teachers' adherence to the curriculum and quality of implementation has been registered as moderate to high in both preschool and kindergarten, with teachers in both grades implementing at least 70 percent of the content with fidelity.

CAN ALIGNMENT SUSTAIN PRESCHOOL GAINS?

There is much that is still unknown about the role of instructional alignment across preschool and elementary school. Primarily, there is a need for more rigorous evidence to demonstrate whether instructional alignment improves student outcomes and whether aligned approaches *reduce early achievement gaps* over time. The **MPC/High 5s** study is continuing to track children into third grade to examine whether this aligned math instruction approach continues to close the achievement gap in the long term. The **ExCEL P3** team is engaged in an experimental study examining the impacts of the *Focus on Early Learning* program on a diverse set of children's math and language skills in third grade. Efforts are also in place to conduct implementation and descriptive research on instructional alignment as the target cohort of children in the MDRC study move into third grade in the 2020 — 2021 academic

FIGURE 2. Focus on Early Learning Components Observed



SOURCE: Live observations of BPS pre-K and kindergarten classrooms conducted in winter 2017 and 2018, respectively. Observations were collected by BPS instructional coaches.

NOTE: Sample size is 41 pre-K classrooms and 102 kindergarten classrooms.

year. MDRC will begin to release results from the impact analysis in 2023.

Once it is clear what constitutes effective approaches to aligned instruction, the challenge will be to learn more about how these practices can be sustained *at-scale*. For example, the **High 5s** math curriculum pulls students out of their regular classroom activities. There is a need to build an approach to integrate instructional alignment into existing practices in a sustainable way. As such, MDRC and the University of Michigan are collaborating with a midwestern school district to design a new version of the **High 5s** model that fits into the typical day. The team is working with teachers to collect feedback about the activities and materials, logistical constraints, and children's responses to the activities, after which MDRC will conduct a pilot study of implementation in two localities.

Finally, it is important to ensure that approaches to aligning instruction can be successful across a diverse set of school structures, staff, and student populations. To date, the **ExCEL P3** study has examined fidelity of implementation to the *Focus on Early Learning* model across a range of schools that are representative of the broader Boston Public School district. As part of this work, MDRC will leverage natural variation in teachers' fidelity of implementation to understand how the model differs by school and student characteristics and how fidelity relates to program impacts. Even so, our work on **ExCEL P3** and **High 5s** can only be generalized to two school districts. As such, MDRC and the University of Michigan are also planning to recruit additional schools in two or more different localities to further test the effects of the adapted **High 5s** model on children's outcomes. The evaluation will expand program implementation to a larger set of schools and a broader range of districts.

IMPLICATIONS OF MDRC'S WORK

There are continued pressures on districts to implement strong early childhood programs

that can support students' academic development across the transition from preschool to elementary school and prepare children to read at level by third grade. During this unprecedented period of growth in the availability of preschool, coupled with increased attention to instructional alignment as a promising strategy to reduce the fadeout of preschool gains, districts that test their new instructional approaches with rigorous impact research will not only make progress towards their goals but will build knowledge that can inform the work of other districts. MDRC's work in this area responds to this policy need and will continue to build experimental and descriptive evidence on alignment in the coming decade.

ENDNOTES

1 Stipek et al. (2017).

2 For example, the U.S. Department of Education's Preschool Development Grant Program recently began including "alignment within a birth through third grade continuum" as one of its seven priorities for awarding grants (USDOE, 2018).

3 Reardon and Portilla (2016); von Hippel, Workman, and Downey (2018).

4 Heckman, Pinto, and Savelyev (2013); Yoshikawa et al. (2013).

5 Claessens, and Curran (2014); Lipsey, Farran, and Durkin (2018).

6 Polikoff, (2012).

7 Kauerz (2010).

8 Abry, Latham, Bassok, and LoCasale-Crouch (2015).

9 Engel, Claessens, and Finch (2013)

10 Farran et al. (2017).

11 Burns (2018).

12 Jacob, Erickson, and Mattera (2018).

13 Clements and Sarama (2007).

14 Mattera, Jacob, and Morris (2018).

15 Boston Public Schools (2019).

16 Weiland and Yoshikawa (2013).

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An investment in early childhood education pays off when the benefits continue into adulthood. Although many recent preschool interventions have had positive, short-term effects on young children's language, literacy, mathematics, executive function, and social-emotional development, studies show that related gains in cognitive and academic skills tend to diminish in early elementary school — a phenomenon commonly known as fade-out. Instructional alignment — or implementing educational systems that effectively build on the learning advances made in preschool — is one of the leading strategies for sustaining the benefits of early childhood education. This brief further examines the concept of instructional alignment and its potential for upholding the longer-term advantages of preschool programs. This paper looks specifically at two projects that MDRC is using to study the effects of instructional alignment on classrooms and students— the Making PreK Count/High 5s and ExCEL P3 projects. The brief summarizes the latest results from these projects and identifies how future work that is driven by MDRC's studies can inform educational research, policy, and practice.