

# ASPE RESEARCH BRIEF

OFFICE OF THE ASSISTANT SECRETARY FOR PLANNING AND EVALUATION  
OFFICE OF HUMAN SERVICES POLICY - U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

## IN THE RUNNING FOR SUCCESSFUL OUTCOMES: PROJECT OVERVIEW

### Exploring the Evidence for Thresholds of School Readiness

#### Background

Children's school readiness has long been of interest to policymakers, educators and early childhood practitioners. Children from disadvantaged backgrounds (e.g., low-income and/or single parent households) enter school behind their more affluent peers on a range of academic and social outcomes (Brooks-Gunn & Duncan, 1997; Lee & Burkham, 2002; Reardon, 2011). This gap in school readiness emerges early, is evident even before kindergarten (Fryer & Levitt, 2004; Halle et al., 2009), and is predictive of academic trajectories through later schooling (Entwisle & Alexander, 1999). Concerns about these disparities in skills have focused state and federal efforts on initiatives to improve young children's school readiness, such as through early care and education programs including Head Start, child care and public pre-kindergarten. These initiatives have also led to a proliferation of state early learning guidelines and kindergarten readiness assessments aimed at articulating and evaluating the set of skills and competencies young children need to prepare them for the increased challenges and demands of kindergarten and to succeed in later schooling (Scott-Little, Lesko, Martella, & Milburn, 2007; Stedron & Berger, 2010). Yet, the evidence base available to identify what these guidelines and standards should look like is quite thin. Despite theoretical reasons to believe that early skills are the foundation for later success, few studies have offered more than a piecemeal view of the relationship between specific school readiness skills and later academic, social and emotional outcomes. Research has not clearly articulated what children should know and be able to do by the time they reach kindergarten in order to participate in and benefit from learning in kindergarten and subsequent grades.

#### ABOUT THIS RESEARCH BRIEF

*In 2009, the Office of the Assistant Secretary for Planning and Evaluation (ASPE) of the U.S. Department of Health and Human Services funded Child Trends to conduct a review of the literature as well as plan and execute secondary data analyses to examine whether there is evidence of thresholds of school readiness which, when attained, predict skill acquisition in later schooling. This brief presents some of the key findings from this multi-year project entitled *In the Running for Successful Outcomes: Early Education, Care and Comprehensive Services*. (More information about the project is provided at the end of this brief). Staff in ASPE's Division of Children and Youth Policy oversaw the project.*

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## Research Questions and Methods

In 2009, the Office of the Assistant Secretary for Planning and Evaluation (ASPE) of the U.S. Department of Health and Human Services funded Child Trends to conduct a review of the literature as well as plan and execute secondary data analyses to examine whether there is evidence of thresholds of school readiness which, when attained, predict skill acquisition in later schooling. This project, entitled *In the Running for Successful Outcomes: Early Education, Care and Comprehensive Services*, focused on understanding what children need to know and be able to do at the start of school in order to be “in the running” for long-term success. The overarching interests that motivated this project included:

- Are there particular school readiness skills or a level of development that children need to attain in early childhood in order to meet later measures of success?
- Do outcomes in elementary or later schooling depend on the school readiness skills and competencies in various domains at entry to school?

In order to address these questions the study team analyzed two national datasets and employed various methods. The data sets utilized for the analysis were the National Institute of Child Health and Human Development’s Study of Early Child Care and Youth Development (NICHD SECCYD) and the Early Childhood Longitudinal Study – Kindergarten Class of 1998-99 (ECLS-K). These data sets were chosen because of their nationally representative longitudinal data and the available measures in the domains of interest. While these were the best data sources available for these analyses, the measures they include were not ideal and several subpopulations including children who could not be assessed in English were omitted. Therefore, the results, while informative, should not be interpreted as definitive.

The overall areas of interest questions were operationalized in four specific research questions that guided analyses and led the study team to look for evidence of developmental thresholds in different ways. These questions include:

1. Do children who show qualitatively different patterns of school readiness skills have qualitatively different trajectories of performance on academic and social outcomes during elementary school?
2. Are there non-linear associations between school readiness skills and subsequent developmental trajectories for academic and social outcomes during elementary school?
3. Do children who are in the low and normal range in school readiness skills differ in terms of their developmental trajectories for academic and social outcomes during elementary school?
4. Do children who have qualitatively different patterns of school readiness skills differ in their likelihood of success based on our categorization of their fifth grade academic and social skills?

Two different approaches were used to characterize school readiness and two different approaches were used to characterize success in school. To characterize school readiness a technique called latent profiles analysis was used to identify individual children that were similar in terms of their combination of school readiness skills. These analyses identified four groups of children, with each group representing a different profile of strengths and weaknesses in school readiness skills. Additional analyses regarding specific school readiness skills sought to determine whether either that individual skill or a cluster of all school readiness skills predicted subsequent academic and behavioral skills during the school years. The school-age outcomes were analyzed by examining children’s academic achievement scores over time in four areas: reading, math, social skills, and behavior problems. Specifically, quadratic group growth curves and linear individual curves were estimated for each

outcome. Technical details regarding the analyses conducted may be found in the technical report for this project.

## **Key Findings**

This study represents a multi-method approach to examining the evidence for thresholds in the association between children’s school readiness and subsequent academic, social and emotional outcomes, both within and across domains. Results across analyses suggested some, albeit limited, support for thresholds of school readiness, but strong associations between school entry skills and later school outcomes.

**There was no evidence of thresholds in school readiness skills above which children showed more rapid acquisition of skills during the school years. However, analyses provided some evidence of thresholds related to subsequent acquisition of skills among children who entered school with lower skill levels on the school readiness skills.**

- None of the analyses showed any evidence of a “springboard effect” whereby above a threshold of school readiness children showed accelerated growth over time. This conclusion held whether looking at skill levels within individual school readiness domains or when looking at the patterns of skills at school entry across multiple domains.
- All of the longitudinal analyses indicated that children who perform at the lowest levels at kindergarten entry tended to show slightly larger gains over time than other children. These gains reduced the gap in school-age outcomes slightly, but did not result in “catch up” to their peers in absolute levels of performance. The accelerated growth among initially lower-performing children could be considered a threshold effect, albeit a very modest one.

**There was evidence that entry skill levels predicted the level of skills during the school years.**

- All of the longitudinal analyses indicated that children who entered with stronger school readiness skills tended to maintain their advantage over time, while children who entered with lower school readiness skills tended to maintain their relative disadvantage over time.
- The piecewise analyses suggested that school entry skills were stronger predictors of levels of school-age academic skills and behavior among children who entered school with skills in the “normal” range of performance than among children who entered school with skills in the “low” range of performance.

**School readiness variables provided differential prediction of developmental outcomes.**

- No single school readiness variable provided the best prediction of all school-age outcomes in any of the analyses.
- All analyses suggested within-domain prediction. For example, entry-level math skills provided the best prediction of subsequent math skills and entry-level social skills provided the best prediction of subsequent social skills.
- Aside from within-domain prediction, content-based skills (e.g., language and general knowledge) were the best predictors of academic skills later in elementary school, whereas social skills and process skills (e.g., approaches to learning and attention) were the best predictors of later behavioral skills.
- There was no compensatory nature between the school readiness domains and their associations with outcomes over time. The analyses did not find evidence that stronger social-

emotional skills compensated for weaker cognitive skills or that stronger cognitive skills compensated for weaker social skills.

## Summary

**Overall, the school readiness skills with which a child enters school do seem to matter in terms of level and rate of acquisition of academic and social skills during elementary school.** The analyses presented in this study corroborated findings shown elsewhere: strong school readiness skills were associated with higher performance in later schooling, both for academic and behavioral outcomes, although there was no evidence that they showed faster acquisition of skills during the school years. But, the effects of early skills on later achievement were probabilistic, not deterministic; children with lower school entry skills were likely to show lower achievement later in school, but children with lower levels of entry skills showed slightly larger improvement over time than their peers with higher skills at school entry. Basically, these findings suggest that improving children’s school readiness skills will benefit them no matter where they may be on the continuum. **Children do not need to reach the national average for achievement in order to be “in the running” for later school success, but the better a child’s skills are when he or she enters school, the better his or her skills are likely to be in elementary school and beyond.**

This study shed new light on the concept of school readiness and its relationship with later outcomes. No one school readiness skill emerged as the strongest predictor of subsequent academic skills and behavior. Instead, not surprisingly, the skill levels within that domain provided good prediction of subsequent skills. Further, the findings indicated that it appears that children who enter school with both strong process skills such as attention and approaches to learning and strong content skills such as language and general knowledge skills are more likely to experience success in terms of both behavior and academic skills during their school years. **The fact that there was differential prediction from entry skills to later skills but no single school readiness skill emerged as the strongest predictor of both academic and behavioral outcomes emphasizes that children need to develop a constellation of school readiness skills in order to have a better chance of being successful in elementary school and beyond. Further, the findings may provide additional focus as practitioners, policy makers, and parents make decisions about early education.** The results suggest that a focus on improving content skills is more likely to translate into improved academic skills during the school years and a focus on improving social and process skills is more likely to translate into improved social skills during the school years.

Although there was no evidence that children with lower school-entry skills fully “catch up” to their higher-performing peers during the school years, the data did show some evidence of a reduction in the gap between children who start school with higher and lower skills. This suggests that school itself is likely a critically important intervention for the most at-risk children.

## Limitations and Implications for Future Research

The findings of the *In the Running* project present important implications for early childhood research, policy, and practice. In particular, the results suggest that school entry skills are strongly connected to later achievement. However, while there was evidence of differential prediction among school readiness skills, there was no evidence of a specific skill level that young children need to reach in order to succeed later in school. This importance of school readiness skills but lack of strong evidence for specific school readiness thresholds have significant implications for the goals early care and education programs set for children’s growth and development, how State and Federal early childhood initiatives define what it

means for children to be “school ready,” and how early childhood progress and school readiness are measured. States can use these findings to support continuing efforts to improve children’s skills in all domains before school entry and to reassess the appropriateness of their school readiness benchmarks and kindergarten entry assessments.

The *In the Running* project was exploratory and only a first step in looking at this important topic from a systematic, empirical standpoint. All analyses were conducted to describe association, not to estimate causal linkages. More research is needed that explores school readiness levels systematically so that policy and practice decisions can be made on sound research findings. This future research can collect data on more specialized measures of school entry skills, later development, and the measures and benchmarks used by states in their benchmarks or kindergarten entry assessments.

While the *In the Running* project represents a more complex and thorough investigation of school readiness thresholds and trajectories than had previously existed in the literature, the analysis was challenged by measurement issues. Most large-scale national surveys do not use criterion-based measures (i.e., those that measure a child’s performance against a fixed or objective scale or benchmark as opposed to measuring their performance in the context of other children) which lend themselves better to cutpoint analyses and which are more similar to the types of measures states and school systems are using currently to assess children’s skill levels in kindergarten. Finally, the measurements of the datasets relied heavily on subjective parent and teacher reports of the child’s approach to learning and social skills as opposed to direct assessments. These reports tend to be less precise than the achievement, language, and attention assessments, in part because they are subject to respondent bias.

**Although the secondary data analysis uncovered only limited evidence of school readiness thresholds needed to achieve later school success, the differential prediction to outcomes over time based on skill level at school entry still suggests important policy and practice implications.**

- There was some evidence of a reduction in the gap between children who started school with higher and lower skills, but not strong evidence of “catch up” in terms of absolute level of performance. Schools can and do benefit children who enter kindergarten with low skill levels.
- The evidence suggested that children’s later outcomes can be improved by increasing their school readiness skills, regardless of where they are in relation to the national average.
- There are long-term developmental benefits to helping children reach and exceed the “normal range” (i.e., at or above one standard deviation below the mean) at school entry. All children can grow and benefit from early care and education programs. The goal of these programs should be maximizing child growth before school entry rather than achieving specific skill thresholds.

## **Conclusion**

The multiple analytic strategies employed as part of the *In the Running* project were primarily exploratory in nature and involved person-centered and variable-centered approaches to describing school readiness skills and longitudinal and retrospective analyses of school-age outcomes. Regardless of the analytic strategy, a single story emerged with a relatively similar pattern of results across two different datasets. Findings indicated that the level of skill with which children entered school did indeed seem to matter for later outcomes. Children’s school readiness skills predicted levels of academic skills and behavioral skills during the school years, with stronger prediction of subsequent *level* among children in the “normal” range of performance at school entry and stronger prediction of *rates* of

change among children in the “low” range of performance at school entry. For those who were lower in skill level at the beginning of school, entry skill levels were stronger predictors of growth compared to their higher-performing peers. Collectively, these findings indicate that efforts to support children’s school readiness skills prior to school entry are critically important, and that school itself may be an important intervention for those children most at risk of poor outcomes.

The lack of strong evidence for a clear “threshold” for school readiness either within or across domains of development at kindergarten entry or that a single school readiness variable is especially important for subsequent academic achievement and behavior may have been due to limitations of the data sources used in this study. But researchers, practitioners and policymakers should be open to the possibility that there is no specific measure or score on an assessment that will identify which children at kindergarten entry are or are not “in the running” for future success. More studies, perhaps using well-designed criterion-based measures and causal analytic methods, can further explore this timely and policy-relevant question. However, it should be kept in mind that while criterion-based skill measures are critically important to identifying and tracking a child’s development, they should not be used to create artificial thresholds of achievement.

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