



## Understanding the Relationship Between Family Income and School Readiness in Memphis

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### IN MEMPHIS, CHILDREN REACH SCHOOL WITH MEANINGFUL DIFFERENCES IN SCHOOL READINESS

Memphis City Schools uses a screening tool called the Kindergarten Readiness Indicator (KRI) to assess the school readiness of incoming students and guide classroom instruction. The KRI also represents a powerful public policy tool for promoting the optimal early childhood development and later academic success of all our children.

Across the country, children from more affluent families and neighborhoods are more likely to be ready for school when they reach kindergarten. We see this general relationship in Memphis as well. But as the KRI makes clear, the relationship between family income and school readiness is not fixed: there are children in Memphis who are both extremely poor and also extremely well-prepared when they arrive at kindergarten. For policy makers and the public, this suggests that if we look beyond broad demographic risk categories, we can identify meaningful differences in early life experiences that translate into marked differences in school readiness for our community's children.



## HOW – AND WHY – DO WE MEASURE KINDERGARTEN READINESS?

Since the fall of 2006, Memphis City Schools (MCS) has used a screening tool called the Kindergarten Readiness Indicator (Memphis City Schools, 2006) in order to provide teachers with a quick assessment of incoming students' mastery of the basic concepts underlying language and math. Although the KRI is not a nationally-normed instrument, evaluations suggest that it is comparable to other – nationally-normed and standardized – assessments of mastery of pre-literacy and pre-math concepts (Sell, 2008).

The KRI represents an opportunity to identify factors that help to support school readiness and lead to later academic success. It also gives us meaningful insights into the relative readiness of different cohorts of children – for example, children who attended a strong curriculum based program such as Head Start or Pre-Kindergarten. We can then compare them to other groups of incoming kindergartners (for example, children who did not attend a center-based preschool). Results on the KRI also let us compare the readiness of groups of children over time. With this information, MCS and the Memphis community have an opportunity to identify, promote, and expand early childhood experiences that support optimal early childhood brain development, leading to school readiness and academic success.

Looking at school readiness in this way offers a powerful public policy tool for our community as we work to promote the optimal early development and later academic success of all our children, leading to future generations of well-educated, productive citizens. Early childhood is a key part of this story because the first years of life are a period of extraordinary brain development and plasticity – during these years positive interventions are likely to have the greatest effect on subsequent development and well-being.

## SCHOOL-READINESS REFLECTS EARLY CHILDHOOD DEVELOPMENT.

A growing body of evidence from pediatric neuroscience tells us that the first few years of life are a period of astonishing brain development. At birth, a child's brain contains close to 100 billion neurons, but brain development is far from complete at that point. To function, a neuron needs accurate connections with other neurons. These connections (or synapses) allow neurons to send and receive information, and the brain's networks of neurons and synapses form the underpinning of all cognitive development. During the first four years of life, synapses that are used regularly are strengthened, while synapses that are not used are pruned (National Scientific Council on the Developing Child [NSCDC], 2004).

Early brain development is particularly responsive to positive interventions because children's brains develop in response to their environment. An environment of nurturing and supportive relationships nurtures a child's innate curiosity and desire to learn, setting that child on the path

to a lifetime of learning. Conversely, when we allow children to spend their first few years in an environment of uncertainty, chaos, and neglect, we miss a critical opportunity to strengthen early brain development and school readiness (Pati, et. al., 2009).

## **SCHOOL-READINESS PLACES CHILDREN ON A PATHWAY TO ACADEMIC SUCCESS.**

Children who reach school ready to learn are more likely to experience continued success through school and later in life (Duncan, 2009; Willms, 2007). High-quality, intensive early childhood interventions such as the Abecedarian and Perry Preschool programs, for example, have resulted in markedly improved adult outcomes and dramatic economic returns on their initial cost (cf.; Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002; Schweinhart, Xiang, Barnett, Belfield, & Nores, 2005).

Early experiences can translate into school readiness, academic success, and lifetime well-being. Success builds upon success. When more children in a community reach school ready to learn, community-wide levels of human and social capital rise. This is why economists tell us that high-quality, early-childhood investments are the smartest development dollars that a community can spend (Rolnick & Grunwald, 2007). These early investments, in turn, provide a rock-solid foundation for investments later in life: The dollars we spend on older children – through k-12 public education, for example – go further when they build upon strong early childhoods (Heckman & Materov, 2007).

Kindergarten-readiness also serves as a marker for the developmental trajectory of children. Longitudinal studies link early childhood development with later life outcomes and show that early mastery of the skills associated with kindergarten readiness establish the foundation on which higher-order skills develop. In this way, children who reach school ready to learn are more likely to read comfortably by fourth grade, to advance successfully through middle and high school, graduate on-time, and go to college (cf., Duncan, 2009; Lee & Burkham, 2002; Sadowski, 2006).

## **THE FUTURE IS NOT WRITTEN IN STONE IN EARLY CHILDHOOD.**

Measures of school readiness are far from perfect, and children develop at different rates. Moreover, later gains and accomplishments reflect a range of individual, family, community and school influences. No doubt, gifted teachers deserve much credit for helping to unlock our love of learning, and for putting us on the pathway to becoming the adults we are today.

Still, there is a strong relationship between skill levels at kindergarten entry and later achievement. Measures of academic skills at kindergarten-entry explain between 40 and 50 percent of the variation in first and second grade academic scores (LaParo & Pianta, 2000). There is also

a strong relationship between academic skill levels at kindergarten entry and at fifth grade performance (Classens, Duncan, & Engel, 2009).

## **HIGH-QUALITY PRE-KINDERGARTEN SUPPORTS SCHOOL READINESS.**

Early experiences matter for school readiness, and high-quality early education prepares children for a successful transition to kindergarten. A careful analysis of KRI results found that beginning kindergartners who arrived from a center-based early education program (including Memphis City Schools' Pre-Kindergarten program, the federal Head Start program, or a similar center-based early-education program) performed significantly and markedly higher on the KRI than did students who had not attend a similar preschool (Sell, 2009). These findings echo national results. A report in *Science*, for example, demonstrates that preschool programs boost school readiness (Gormley, et. al., 2008). The research team found that while almost all children benefit from a year of pre-kindergarten, it is the children who are at greatest risk – low-income kids – who make the greatest gains (Gormley, Gayer, Philips, & Dawson, 2004).

## **WHY DOES PRE-KINDERGARTEN MAKE SUCH A DIFFERENCE?**

For one thing, children in center-based care are introduced to a wider variety of adult language models. Young children's language and vocabulary develops through exposure to language from adults – whether through conversation, storytelling or reading (e.g., Berko-Gleason, 2005). When it comes to language development, more is better. Given that children's exposure to language can vary widely across families (e.g., Hart & Risley, 1995), the additional adult language heard in preschool may give children a boost toward school readiness.

Participating in center-based programs is likely to influence other aspects of school readiness as well. Center-based programs offer more opportunities to play with toys, puzzles, counting and sorting games. Teachers introduce activities that enrich cognitive, social and physical development and expand children's general knowledge. Children in center-based early education also learn how to navigate the schedule of a school day, how to peacefully resolve problems with peers, and how to pay attention to directions.

Meanwhile, children in poverty – precisely the cohort of children most likely to benefit from high-quality early care and education – are much less likely than their middle-class peers to attend center-based early education programs (Lee & Burkham, 2002). Across America today, more than 85 percent of professional parents place their young children in high-quality, early care and education programs (Barnett 2009). By comparison, the federal Head Start program, the largest effort to make high-quality early care and education available to low-income kids, only reaches about half of children growing up in families living in poverty (Imig & Meyer, 2008). In Memphis, for example fewer than four in ten entering kindergartners have attended either Head Start or MCS pre-kindergarten (King, Midgley, Sell, & Imig, 2010).

## HIGH POVERTY RATES THREATEN KINDERGARTEN READINESS.

Early experiences establish the foundation for school readiness and later achievement. Poverty in early childhood threatens this process and can undermine school readiness. This is a particularly serious issue for the Memphis community, where roughly 6,800 children entering kindergarten each year (close to 80 percent of each kindergarten class) are from low-income families (with incomes eligible for the federal free and reduced price lunch program).

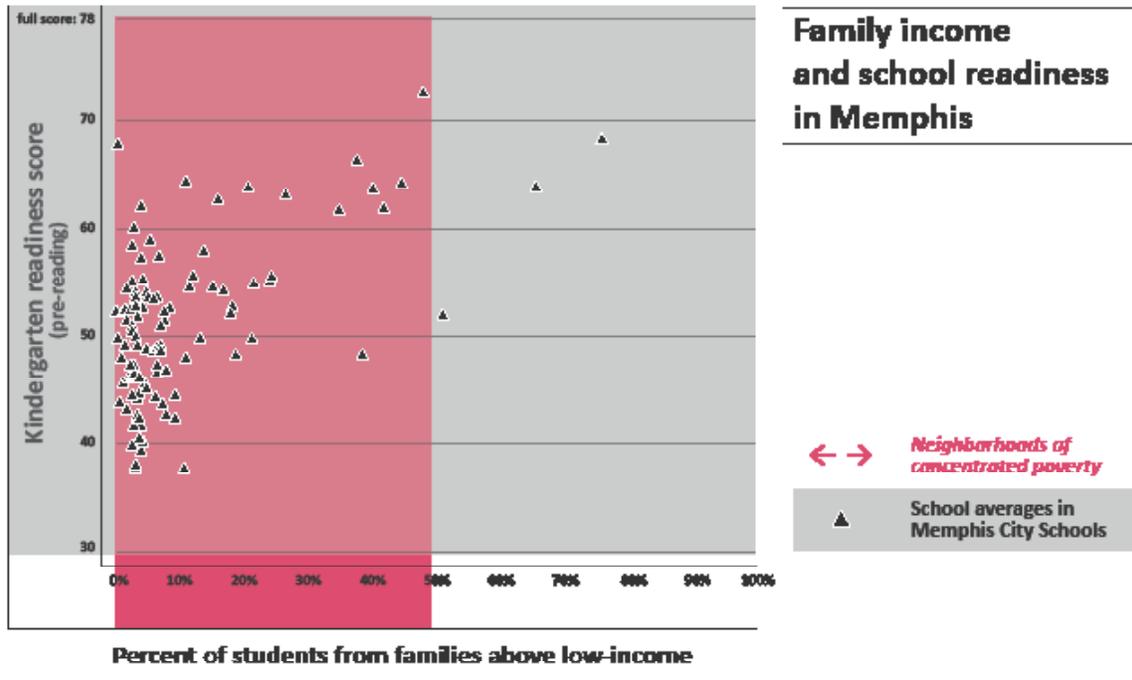
Poverty is strongly associated with differences in early vocabulary development, for example. Children who spend their early years in poverty are likely to arrive at kindergarten with vocabularies far smaller than their middle-class peers (Hart & Risley, 1995; Zimmerman et. al., 2009). As children enter school, early differences in vocabulary grow wider, and lead to measurable gaps in early literacy skills (Snow, Burns & Griffin, 1998; Willms, 2007). Canadian studies have found that the size of a child's vocabulary at age two is strongly related to that child's reading readiness when they reach kindergarten and – in turn – with their reading level at age 15 (Willms, 2007). Lower rates of readiness and achievement, in turn, are associated with a greater likelihood of being held back, of being tracked into special education, and of failing out of school (Reynolds & Ou, 2004). All of these outcomes pose serious negative consequences both for individuals and for society.

## PATTERNS OF KINDERGARTEN-READINESS REFLECT FAMILY INCOME.

The following figure depicts the relationship between family income and kindergarten readiness in Memphis. The Y-axis indicates the average KRI (reading) score of each elementary school in the district, while the X-axis indicates the concentration of children in poverty in each of these schools. (Schools further to the right in this figure educate more middle-income children). As the graph indicates, schools with higher concentrations of middle-income children have higher levels of kindergarten readiness.

The direct relationship between family income and levels of school readiness found in Memphis is consistent with the relationship found in communities around the country. In a recent evaluation of kindergarten readiness in Washington State, for example, the Gates Foundation identified a strong and direct relationship between levels of family income and school readiness.

Painting with a broad brush, cohorts of children from more affluent neighborhoods and families are better prepared when they reach kindergarten than are children from lower income neighborhoods and families. In time, differences in levels of readiness of low and middle-income children that are evident on the first day of school become markers for two very different – and divergent – pathways through early childhood and school.



The data presented in this graph also tell us about the income distribution of families with children in Memphis City Schools. As the graph indicates, more than three-quarters of kindergartners in Memphis live in families – and attend schools – in neighborhoods of concentrated poverty.

The marked differences in the school readiness scores of children from our poorest neighborhoods offer reasons to be optimistic about the future of Memphis. While it is true that the least ready cohorts of kindergartners in the city are found among our lowest-income children, it is also true that some of the strongest cohorts of entering kindergartners come from the poorest neighborhoods as well.

By looking at kindergarten readiness data by school, we are able to identify meaningful differences in the preparation and well-being of cohorts of young children who would be considered equally at-risk for poor outcomes. Moreover, because the KRI is administered in the first few days of kindergarten, we can rule out differences between schools as an explanation of the wide variation in readiness scores.

The question that immediately comes to mind then, is what explains the marked variations in school readiness evident between groups of children growing up in high poverty neighborhoods and families? This is the subject of our next paper in this series.

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## THE TAKE AWAY:

In general, children in Memphis from more affluent families and neighborhoods are more likely to be ready for school when they reach kindergarten. But the relationship between family income and school readiness is not fixed. Instead, we find a number of children from extremely poor neighborhoods in Memphis who also are extremely well-prepared when they reach the school-house doors. For policy makers and the public, this means that among groups of children who are similarly disadvantaged, differences in early life experiences can translate into marked differences in school readiness.

Children are helped along the pathway to successful school readiness by positive parenting styles, by high-quality early care and education settings, and when their innate love of learning is nurtured through communication, reading and play. Supportive early childhood environments help to buffer children from toxic stress, poor health, and violence.

Subsequent papers in this series will investigate the early experiences that account for the significant differences in readiness that we have identified, and the relationship between readiness at kindergarten entry and later academic achievement. With this information, the Memphis community will be better able to celebrate and nurture those early experiences that help to place children who are at-risk for poor school outcomes on a pathway to school readiness and academic success.

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For more information on the well-being of children in Memphis and Shelby County, please visit [The Urban Child Institute](#), and [The State of Children in Memphis & Shelby County: Data Book](#).

[The Urban Child Institute](#) improves the future of our community through investments in early childhood.

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