

Indicators of the Equity of School Readiness

Written for the Committee on Developing Indicators of Educational Equity
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January 19, 2018 Draft

The National Association of State Boards of Education suggests that school readiness must be considered at the child, family, school, and community levels (NASBE, 1991). It is important for children to be ready for school, but families, schools, and communities must also be ready to meet the developmental needs of young children (Graue, 2006). Although families, schools, and communities are essential contributors to school readiness, nearly all discussion of school readiness focus exclusively on assessments of child skills, behaviors and other characteristics and what contributes to children's individual readiness. The focus on the readiness of individual children likely stems from the comparatively stronger prediction from these measures to later schooling outcomes, compared to that of other factors.

Education scholars define children's school readiness as the set of foundational skills, behaviors, and knowledge children display as they enter school that enable them to successfully transition into kindergarten and achieve academic success throughout the primary grades (Sabol & Pianta, 2017). Many factors contribute to variation in school readiness across children, including individual capabilities, health, educational opportunities and experiences during early childhood, and social and environmental factors such as parental education, economic resources, and housing conditions.

Key Domains of Kindergarten Readiness

The set of foundational skills, behaviors, and knowledge that prepare a child to succeed in school span multiple domains and include academic and non-academic skills. The National Education Goals Panel identified five critical components of school readiness (Kagan, Moore, & Bredekamp, 1995):

1. Physical well-being and motor development
2. Social and emotional development
3. Approaches toward learning
4. Language development
5. Cognition and general knowledge, including mathematics.

These domains, however, are incredibly broad and cover a wide-ranging set of skills. As you would expect, knowing everything about a child would help to explain their transition into schooling and later success. Greg Duncan (Duncan & Magnuson, 2011) and I proposed the following typology of key dimensions of early skills and behavior that

¹ Much of the work presented here draws on prior work I have done with my colleagues: Greg Duncan, Jane Waldfogel, Hiro Yoshikawa, and Holly Schindler. I acknowledge their contributions, but remind the reader that I am solely responsible for any mistakes (by omission or commission) in this work.

relate to later school outcomes and ranked them in the following order of importance: 1) early reading and math achievement; 2) Cognitive self-regulation and attention skills and 3) Behavior and mental health. Our review of this literature and our own analysis of data, led us to place the highest priority on the first two categories of measures for forecasting later academic achievement. It is important to note that we do not dismiss the importance of children's behavior and mental health in producing other forms of later school outcomes (e.g., high school graduation), but argue that the associations between school entry behavior and mental health and achievement are largely null in good population level studies. Moreover, measures of problem behavior and mental seem to matter the most in later childhood rather than in early childhood, perhaps because there is a wider variation and in developmentally appropriate behaviors at school entry, or because early grade teachers may be well equipped to adapt their practices to children with problem behavior within a normative range (Duncan & Magnuson, 2011). For this reason, I focus this paper largely on conceptualizing school readiness on achievement and closely related cognitive skills such as language skills, as well as cognitive self-regulation and attention skills (which overlap in key ways with classroom behaviors often grouped under "approaches to learning") throughout the rest of the paper. After a short discussion of the limitations of the evidence base, I turn to defining these key domains, and offer only a short discussion of the evidence supporting the focus on these measures.

Two bodies of literature inform our understanding of to what extent indicators of Kindergarten readiness predict later school success and educational attainment. But both sets of studies limit our ability to make clear causal claims about what are the most important dimensions of children's Kindergarten readiness. First, there are longitudinal studies that rely on variation in observational measures to make inferences about how early skills or behavior predict later school outcomes. These studies tend to include broad populations of children and consider how natural variation in measures of skills and behaviors might predict later education outcomes. A key concern for these types of studies is their ability to support causal inference, rather than provide correlations that are due to some third omitted variable (and thus are not ultimately meaningful predictors themselves). These studies differ quite a lot as to whether they include covariates, and if so whether the covariates measure other dimensions of early skills and behaviors that are likely to be important confounds.

A second set of studies are long-run evaluations of early childhood interventions, which provides more causal inference about of what a boost in some early domain (or collection of early domains) might lead to in terms of improvements in later school outcomes. These evaluation studies provide insight because the skills being considered are changed or manipulated through a specific intervention. The limitation with using this literature to identify key dimensions of school readiness that matter for later outcomes is that rarely do interventions solely target or impact one domain of skills or behaviors (and many target parents as well as children as was the case in the well-known Perry Preschool). Thus, most studies are informative about clusters of school readiness skills, and cannot differentiate which of these might be more or less important for producing long-run effects. Moreover, some studies focus on very specific populations (often of the most high-risk children). Thus, it is difficult to know how generalizable these findings might be to broader populations or to even differing

approaches to improving school readiness. For example, if a particular preschool curricular approach increased language skills and improved children's emotional knowledge, it is hard to know if a different approach to enhancing language that did not include any content on emotions would yield the same outcomes. Thus, although these studies generally offer better rigor with regard to causal inference, they cannot be used to identify the likely effects of changes in school readiness in one specific domain or to broadly generalize the beyond the specific intervention setting or activities.

"Achievement" in the preschool and middle-childhood years refers mainly to a set of reading- and math-related skills. Achievement trajectories are steepest in the early years of school, as children rapidly learn many new skills and improve existing ones. Although learning continues into later school years, the rate of gaining new skills declines over time as more focus is placed on elaborating and improving existing skills.

For early learners, reading-related skills encompass identification of upper- and lowercase letters as well as decoding skills such as beginning to associate sounds with letters at the beginning and end of words. Most early reading problems reflect poor decoding skills and low levels of phonological and phonemic awareness, such as a poor ability to break down words into component sounds. As children progress through childhood, reading skills include recognizing words by sight, understanding words in context, and making literal inferences from passages. By the end of elementary school, students are developing reading comprehension and evaluation skills, which include identifying the main points in a passage as well as understanding an author's intentions and evaluating the adequacy and logical consistency of supporting evidence. Writing skills, specifically a child's ability to express ideas in written form, develop in concert with reading skills (Lonigan & Shanahan, 2010).

Rudimentary math skills can be detected in children as young as six months (Posner & Rothbart, 2007). Concrete math skills begin with the ability to recognize numbers and shapes and to compare relative sizes. Counting and sequencing skills are followed by the ability to perform addition and subtraction tasks, as well as multiplication and division tasks. Understanding numerical properties such as proportions, fractions, integers, and decimals also develops, as do measurement skills and an understanding of geometry. These pre-academic and academic skills develop as a result of learning opportunities embedded in everyday activities and specific instruction, which is especially important for code-related reading skills and computational mathematical skills.

It is not surprising that early academic skills are predictive of later school success, as achievement (in terms of their relative ranking of skills across a broad population) is understood to be largely stable. The National Early Literacy Panel (Lonigan & Shanahan, 2010), concluded after reviewing the literature that "conventional" early reading and writing skills have a clear and consistently strong relationship with later conventional literacy skills.

Research by Duncan et al. (2007) analyzed six datasets to consider which early skills would be strong predictors of later school achievement. The results were that math and reading were the most consistent and strong predictors of later math (.42 and .10 respectively) and reading achievement (.26 and .24 respectively). These analyses held constant child and family background characteristics and also some early measures of language or other more general measures of cognitive skills. Several

subsequent studies have followed up on this work. In terms of math, Watts and colleagues (2014) found that early math skills measured at 54 months of age predicted math skills in third grade, fifth grade, and at age 15 (effects sizes of .24 to .39) when holding constant early cognitive skills and reading skills. Similarly, Jordon et al. (2009) found that number competence in Kindergarten predicted math achievement in third grade. Analyses have confirmed this general pattern of findings in more recent observational data with both reading and math predicting later math and reading achievement (Morgan et al., in press).

The evidence that emerges from interventions that improve early math and reading skills is somewhat complicates the seeming importance of early academic skills for later school success. Studies of some reading and math curriculum, or more general early childhood education programs, are on average moderately effective at improving children's early academic skills (see below for more discussion of this point). Yet, the early education programs that follow children into the early or later school years yield mixed results about the extent to which they show lasting impacts on children's later achievement. A meta-analysis demonstrates that these program impacts typically decline overtime in a geometric pattern (steep declines in the impacts in the years immediately following the program's end; Lin et al., 2017). This implies that only quite substantial initial impacts on early reading and math skills are likely to be found several years after the program has ended. Nevertheless, there is evidence that early childhood education interventions do affect other long-run outcomes such as grade retention, special education placement, and high school graduation (McCoy et al., 2017).

More general cognitive skills also play a role in subsequent academic learning—two areas that are frequently noted are oral language skills and cognitive self-regulation skills. Oral language skills such as expressive and receptive vocabulary have been found to be especially important in the acquisition of reading skills such as identifying letter sounds, and they are increasingly important as children make the transition from “learning to read” to “reading to learn.” Longitudinal studies find that native English-speaking children who have higher levels of oral language skills develop better reading skills than children who enter school with lower levels of such skills (Catts, Adlof, & Weismer, 2006; Dickinson & Tabors, 2001; Senechal & LaFevre, 2002; Storch & Whitehurst, 2002; Snow, Porche, Tabors, and Harris, 2007). Considering dual language learners (DLLs), as children have skills in two languages, several studies have found significant and meaningful associations between early English language skills and later English language reading (Keifer, 2012; Mancilla-Martinez & Lesaux, 2010; Nakamoto et al., 2007). Keifer (2012) also found that although Spanish language skills are also predictive of later reading, that it was not uniquely predictive because Spanish language and English language skills were highly correlated at school entry.

The intervention literature provides less clear guidance on the extent to which improving language skills among a general population will improve school success because most interventions take a broad approach and try to build multiple language and literacy skills, for example, promoting shared book reading with an emphasis on improving print literacy awareness and increasing vocabulary. Finally, although studies of interventions that focus primarily on language enhancement are effective in terms of improving language-based outcomes, there is not much work that considers the extent to these improvements might translate into sustained reading outcomes.

Self-regulation has been defined as the “processes by which the human psyche exercises control over its functions, states, and inner processes” (Baumeister and Vohs 2004). It involves the ability to evaluate the steps and actions required to meet a desired goal and to control behavior deliberately in order to reach that goal. Current theory and research on young children’s self-regulation subdivides the construct in a variety of ways, but almost all works in this area separate cognitive (cool) and emotional components (hot) (Eisenberg, Sadovsky, and Spinrad 2005; Raver et al. 2005).

Cognitive self-regulation is a broad construct including such overlapping subcomponents as executive function, planning, sustaining attention, task persistence, and inhibition of impulsive responses. Duncan and Magnuson (2011) classify this collection of skills as “attention” but emphasize their diverse nature. Research has shown that attention and impulsivity can be detected as early as age two and a half but continue to develop until reaching relative stability between ages six and eight (Posner and Rothbart, 2000). It is widely accepted that some dimensions of executive functioning undergo rapid development during adolescence. Cognitive self-control can be measured by both direct assessments of particular components and more general descriptions of children’s behaviors (especially in structured classroom contexts, which leads to overlap with measures of approaches to learning). Parent and teacher reports of children’s cognitive self-regulation assess the behavioral consequences of children’s self-regulatory skills. For example, items indicate the extent to which children are able to sit still, concentrate on tasks, persist at a task despite minor setbacks or frustrations, listen and follow directions, and work independently or, conversely, whether they are easily distracted, overactive, or forgetful. Attention skills and cognitive self-regulation are thought to be consequential to children’s learning because they increase the time children are engaged and participating in academic endeavors and increase children’s ability to solve problems.

Studies have consistently found positive associations between measures of children’s ability to control and sustain attention with academic gains in the preschool and early elementary school years (Raver et al. 2005; McClelland, Morrison, and Holmes 2000; Brock et al. 2009; Morgan, in press). Yet, there are considerable unresolved question about whether there is a particular dimension of cognitive self-control (or behavioral manifestation of these skills) that matters more than other dimensions, or even if the associations can be interpreted as causal (Willoughby, Kupersmidt, Voegler-Lee, 2012; Fuhs, Nesbitt, Farran, & Dong, 2014). A key point of critique is that one of the best known interventions to improve children’s cognitive control during the preschool years is the curriculum “Tools of the Mind,” developed by Diamond (Diamond & Lee, 2014). Evaluations of the program have provided evidence that it can improve children’s cognitive control (although some evaluations also provide null effects, see Wilson & Farran, 2012), but even in the presence of positive impacts on cognitive control, the program did not have similarly demonstrable impacts on children’s academic outcomes (Barnett et al., 2008). Moreover, there have not been other large-scale studies of interventions for cognitive control that have measured academic outcomes.

Key Correlates of School Readiness

Research on predictors of children’s school readiness has been growing over

time, but the accumulation of rigorous studies has been hampered by the fact that few studies collect national data on children's early reading or math skills (the most important predictors of later school success). The studies that do (for example, ECLS-K studies) often do not have much data on children's early years. Moreover, the challenge of collecting data across multiple contexts such as families, early education settings, and neighborhoods has led to somewhat piecemeal understanding of what contributes to school readiness. Taken, together this means that there is a limited pool of indicators that are broadly applicable across national populations and for which there is a robust evidence.

A well-studied and robust correlate of Kindergarten readiness is family socio-economic status (SES). One reason why school readiness gradients are associated with family SES (measured primarily by combinations of parental education and income) is that SES structures much of a child's early life with respect to the types of experiences children have both within and outside of their home. Indeed, data from the ECLS-K studies of 1998 and 2011 show SES gradients of over 1.1 standard deviations (See Figure 1, from the bottom 20% compared with the top 20% for reading and math) and with differences in approaches to learning (a behavioral proxy for cognitive self-control and attention skills) of somewhat smaller but still sizable magnitude (ES \sim .60 to \sim .50). Evidence suggests that it is not only family SES but also neighborhood poverty predicts school readiness gradients (Wolf, Kimbro & Magnuson, 2017). For this reason, much of the work seeking to understand mechanisms that promote school readiness have looked for areas of difference between low-SES and high-SES children's experiences inside and outside of the home. It is important to note that SES-related gaps are larger than race, ethnicity, immigration and gender gaps in early school readiness.

Below I briefly discuss several key correlates that have been identified as important in explaining SES and other group differences in children's Kindergarten readiness.

Parenting and the Home Learning Environment. A primary driver of children's early school readiness is how much time investments and "cognitive" stimulation children receive from their parents and other family caregivers. Brain development and cognitive development are considered especially plastic in the early years of life, with significant variation in development attributable to early experiences (Shonkoff, 2010). Parents and caregiving more broadly, thus feature prominently in the explanation for variation in children's early developmental outcomes as the primary settings for most of children's experiences.

Research has identified key aspects of parental investments that are associated with children's early skills and that also vary across SES and other relevant social groups (specifically race, see Brooks-Gunn & Markman, 2005). A basic indicator of parental investment is the amount and quality of time that young children experience with their parents. Time use data show significant variation as well as steep SES gradients in the amount of time spent with children by parents (Guryan et al., 2008; Sayer et al. 2004; Kalil, 2012). Time is obviously a rough proxy for investment as how that time is spent, the quality of interactions that children experience is also very important. Also, using self-report time diary data, Kalil and colleagues (2012) examined the gradient in the developmental quality of time that mothers spend with their children

and found meaningful gradients by mothers education. Of particular interest is that that the maternal education gradient was steepest for young children.

Another set of studies focus specifically on understanding children's interactions with their parents by collecting more detailed data on specific parenting constructs at a point (or several points) in time. These measures may be either self-report or observational, and may focus on the nature of a specific interaction or ask about the frequency of particular behaviors. The types of parenting and activities that are measured by researchers include: the warmth and responsiveness of parents to their children during daily activities (although typically a mother), amount and complexity of language interactions between parents and children, the amount of shared book reading (especially dialogic book reading and other related literacy activities, the amount of math related activities and math-related talk (Waldfoegel, 2012; Manolitsis, Georgiou, & Tziraki, 2013; Susperreguy, & Davis-Kean, 2016). A final aspect of parenting that is sometimes considered as factor predicting children's early skills is the extent to which the child participates in enrichment activities outside the home such as music, sports or arts classes. Although these activities may not directly involve parents in the delivery of the content, they are often put under the domain of parenting because they require parents to seek out and arrange for their child's participation.

All of the above described parenting constructs, practices activities have shown to be predictive of some dimensions of children's Kindergarten readiness in observational studies (Maloney et al., 201; Waldfoegel, 2012). Although often the associations are specific to particular domains, and often modest in magnitude. (Although that may not be surprising for point in time measures given concerns about the conceptual importance of accumulated experiences and the prevalence of family instability during early childhood with resulting consequences for measurement error of point-in-time measures). For example, math language and activity has been shown to be specifically linked to early math skills (Susperreguy, & Davis-Kean, 2016; Manolitsis, Georgiou, & Tziraki, 2013). Likewise, parent-child shared book reading is generally associated with early literacy skills (Hindman et al., 2008). As such, it is only when a broad range of parenting dimensions and practices are jointly considered in predictive models, that parenting broadly and robustly predict a broad set of children's early skills—such as achievement. For example, Waldfoegel and Washbrook (2011) find that a set of parenting measures including maternal sensitivity, reading to a child, out-of-home activities, parenting style, and expectations are able to “explain” about 40% of the SES gaps in early skills (see also Raver, Gershoff & Aber, 2007).

However, a key limitation of the focus on parenting as a primary driver of children's early learning, is that the bulk of the evidence for the importance of parenting comes from observational studies (or studies of animal models – see Hackman, Farah & Meany, 2010). Thus, there is considerable concern that the evidence is not strong enough to support causal claims. Moreover, the literature on how parenting interventions affect children is quite mixed. There are numerous parent interventions that show modest impacts on parenting practices, but minimal impacts on children (Magnuson & Schinder, 2017; Kalil, 2012). The mixed results are often attributed to the failure of program to engage or motivate parents to engage in new patterns of interaction (Maloney et al., 2015; Kalil, 2012). In addition, when parenting programs do impact children's outcomes, they programs tend to have been designed to target a

specific set of somewhat narrow practices that are known to be closely related to the growth of a specific set of skills. For example, the Family Check-Up program which used positive behavior support with parents of children who are at risk of behavior problems improved children's early language skills and measures of inhibitory control (Lukenheimer, 2008). Findings from the evaluations of parenting interventions argue for the importance of at least specific children's interactions and experiences with their parents and family as being formative, but because interventions have not succeeded in changing a large range of parenting practices simultaneously it is hard to evaluate the overall contribution of parenting to children's school readiness.

Early Childhood Education. One of the most common and policy relevant out of home experiences that young children experience is early childhood education (ECE). There are sizable differences in ECE enrollment by SES, race and urbanicity and differences in enrollment or quality are implicated in Kindergarten gaps related to SES, race/ethnicity, immigration status and urbanicity (Magnuson & Waldfogel, 2005; Magnuson & Waldfogel, 2016). Investments by federal, state and local programs have increased considerably in the past 30 years in efforts to reduce enrollment gaps and improve access to high quality ECE for disadvantaged populations.

Hundreds of evaluation studies of early childhood education programs have been published over the past fifty years, including small scale demonstration projects such as Perry Preschool, Head Start, and more recently state and local prekindergarten programs. Given the range of diverse programs that children experience, attention to the average impacts across programs seem most relevant and important. As part of a collaborative research project, we analyzed ECE evaluations conducted over the course of the last half-century that used strong experimental or quasi-experimental methods and provided impact estimates for cognitive or achievement-related outcomes. Taken as a whole, the simple average effect size for early childhood education on cognitive and achievement scores was .28 standard deviations at the end of the programs' treatment periods. However, average effect sizes varied substantially and studies with the largest effect sizes tended to have the fewest subjects. When weighted by the inverse of the squared standard errors of the estimates, the average drops to .23 standard deviations (Leak et al. 2014).

Thinking about more than enrollment in an ECE program, specifically experience within in preschool classrooms as a predictor of children's Kindergarten readiness is much more complicated. Many measures of early childhood education "quality"—especially structural measures are only weakly and inconsistently correlated with children's school readiness (Burchinal, Magnuson, & Powell, 2015). Observational measures of classroom instructional quality or language environment are somewhat stronger predictors of children's learning, but the associations are small (Burchinal, Kainz, & Kai, 2011). Thus, only very large differences in observed quality would yield meaningful differences in observations of children's school readiness. Moreover, it's unclear how meaningful these differences are in explaining.

Some evidence points to the use of evidence based skill-based curriculums as being a particularly effective way to boost the effectiveness of early learning programs (Duncan et al., 2015). Although most of the work in this area is compelling because it is based on experimental studies, the overall number of studies is still relatively small. As a result, there is much more to learn about how generalizable these findings might be to

other settings, and the types of curricular supports that might be needed to effectively implement reading and math curriculum so as to maximize children’s early learning. Given the current state of the research, it is hard to characterize ECE programs ability to improve children’s Kindergarten readiness based on meaningful variation in observable program or classroom “quality” indicators or curriculum (at least in a policy relevant or scalable way).

Community or Environmental Conditions. An increasing body of rigorous methodological research is starting to identify environmental conditions and hazards as threats to children’s early learning and potentially Kindergarten readiness. The environmental and community conditions are now identified as part of the explanation for social group differences in human capital accumulation (DilworthBart & Moore, 2006). I mention just three examples of this current work to provide a sense of the diversity of the work. Persico and colleagues (2016) find that in-utero residential proximity to environmental toxin as measured by Superfund sites predicts children’s achievement. Aizer and colleagues (2016) finds that lead abatement efforts are associated with improvements in children’s school outcomes. And finally, work by Sharkey and colleagues as well as others finds that exposure to community violence is associated with lower academic test scores among school age children (Marogolin & Gordis, 2000; Sharkey et al., 2014; Sharkey, et al., 2010).

Although the work in this area of environmental influences is increasingly and the research designs often compelling, the extent to which variation in these environmental exposures and experiences (in isolation or in combination) serve to inform differences in broad population disparities in school readiness remains unclear as nearly all the work in this area is geographically specific and most uses data on older children. No doubt as more work is done in these areas (and as more data becomes available) this will be a fruitful area of inquiry.

Key Indicators of Kindergarten Readiness Equity—This section is the least developed but below are my thoughts. I would greatly appreciate any feedback the committee can offer!

The challenges in identifying and measuring equity indicators of school readiness are immense. Because most because young children have yet to enter the formal school system it is challenging to collect data about factors that contribute to Kindergarten readiness, as all of the data must be collected through population-based samples of parents of young children or other organizations that serve young children. The later can be done by embedding questions in current data collection efforts (for example, the National Household Education Survey, NHES, or other surveys).

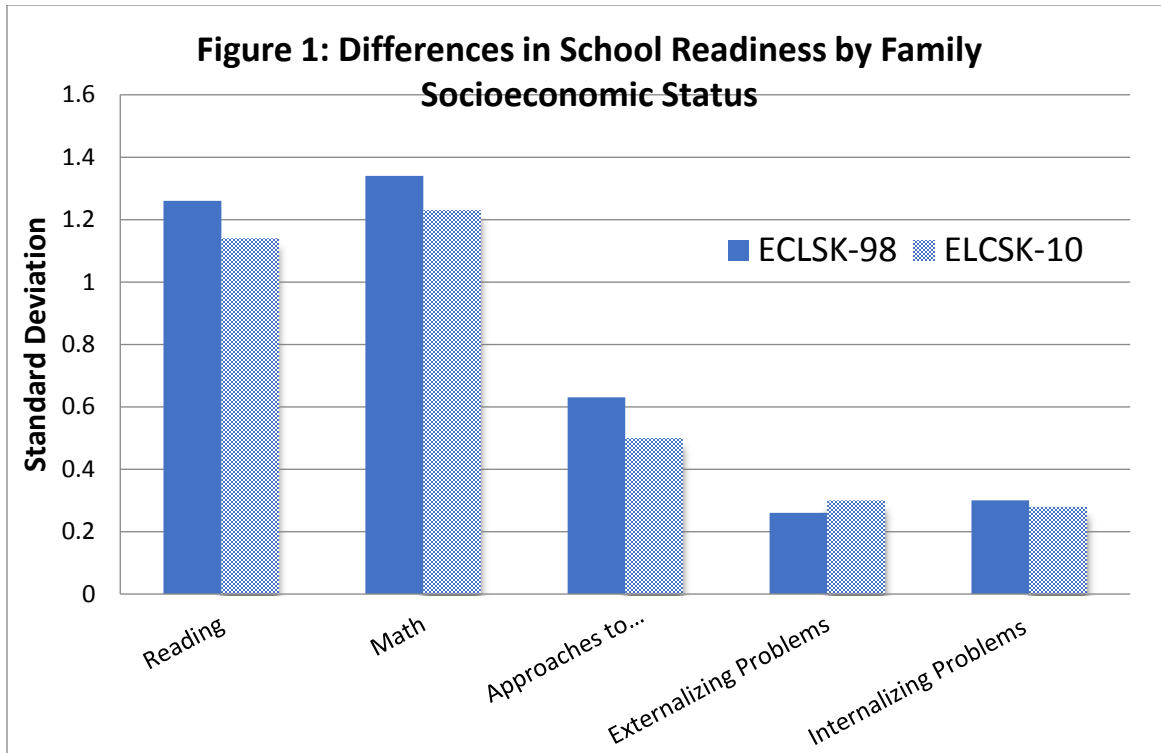
My recommendations are for the following:

- 1) My first recommendation is that it is important to gather some standardized and uniform assessments of children’s early skills on a regular basis. I argue for this because this is the most direct way to understand inequities in Kindergarten Readiness. Indeed, important work using the two cohorts of the ECLS-K (1998 and 2010) has been quite important in showing changes in children’s early skills as well as some inputs into those skills. Moreover, there are probably better

candidate measures of early skills than for many other indicators of the inputs and factors that shape school readiness (meaning more valid and reliable). A key challenge is that this type of effort would ideally require the use of direct assessments (and less ideally child-specific teacher reports). Although many state and local educational programs do school readiness assessments that assess reading and math skills at the beginning of Kindergarten, the quality, psychometrics and validity of these measures are not well studied. In addition, because of the wide variation in the measures used, it does not seem likely that measures that are currently collected at the local level could be usefully aggregated in a way that would make national comparisons across groups useful. That said, it may be that with considerable technical effort that it would be possible to equate some similar set of items that are used across common Kindergarten assessments that states and districts are commonly using. My first choice would be for brief assessment of early reading skills and math skills similar to what is measured in the NCES ECLS studies. A second choice might be a measure of children's English language skills, specifically receptive and expressive English language skills. The later might be especially important for understanding the school readiness of DLL children. Given that literature on cognitive self-control shows smaller associations with later school outcomes, and that assessments may be harder to translate in meaningful ways into public discourse, I would hesitate to suggest that this should be a high priority for developing as a Kindergarten Readiness Equity Indicator.

- 2) My second recommendation is to gather information about children's participation in ECE programs at least in the two years prior to Kindergarten entry (roughly ages 3 and 4). This reflects both a child's own experiences but is also reflects community capacity, as rates of participation may be lower in communities that do not provide access public prekindergarten or Head Start programs. This data is already tracked in several national studies (National Household Education Survey and the October Current Population Studies) but these data provides minimal details about the type/setting of the ECE program or the dosage of attendance (most of the questions are asked about a point in time). Far more complicated, but also relevant would be to measure some aspect of the quality of children's experiences within early learning programs. Observational data on program quality would be prohibitively expensive, and as noted above there is not a consensus about structural measures of program quality (teacher education or class size), which would be less costly to collect, that are meaningful predictors of children's school readiness. Thus, measuring program quality in a meaningful way does not seem feasible given the current knowledge base.
- 3) My third recommendation would be to collect some information about the quality of home learning environments and parenting that children experience. Again, finding measures would be policy-relevant, easily understood in public discourse, behavioral based and that have good psychometric properties is exceptionally challenging. Almost certainly these measures would necessitate relying on point

in time survey based methods of data collection, and these have significant methodological limitations. Nevertheless, because of the seeming importance of parenting for children's Kindergarten Readiness, I discuss a few possible options to be considered. Conceptually and empirically the prior literature would suggest it would be important to assess two broad dimensions of parenting—the provision of cognitive stimulation (inside and outside of the home) and warmth and responsiveness of mother-child interactions (or primary caregiver-child interactions). In the domain of cognitive stimulation, candidate indicators for parenting measures might include the number of days a week that parents typically read with their children per week and engage them in other specific learning activities (for example games that include counting). An additional set of indicators might consider the frequency of children's participation in enriching out of home activities and trips (e.g, going to the library, museums, or zoo). This measures, however, do lack evidence of validity (other than predictive validity). Measures of warmth and responsiveness could pull from questions in the widely used HOME scale or ECLS studies that ask about parents' warmth and closeness with their child, their use of harsh discipline, and potentially their parenting stress. If there is interest in a focus on the more severe end of harsh parenting such a maltreatment—then measures such as the Conflict Tactics Parent-Child Scale (Straus et al, 1998) might be feasible.



Notes: The graph shows standard deviation differences in skills and behavior for children in the lowest income quintile and the highest SES quintile based on estimates in Table 1. ECLSK refers to the Early Childhood Longitudinal Study Kindergarten Cohort studies, which were fielded in 1998 and 2010. “Approaches to Learning” is the ECLS-K measure of attention and school engagement. SOURCE: Duncan & Magnuson (2011).

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