



Working Paper:

Is Kindergarten the New First Grade? The Changing Nature of Kindergarten in the Age of Accountability

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Recent accounts suggest that accountability pressures have trickled down into the early elementary grades, and that kindergarten today is characterized by a heightened focus on academic skills. This paper documents substantial changes in kindergarten classrooms between 1998 and 2006, using two large nationally-representative datasets. Nearly all measures examined changed substantially over this period, and always in the direction consistent with a heightened academic focus. While in 1998, 31 percent of kindergarten teachers indicated that most children should learn to read in kindergarten, in 2006 65 percent of teachers agreed with this statement. Time on literacy rose by 25 percent from roughly 5.5 to 7 hours per week and exposure to social studies, science, music, art and physical education all dropped.

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IS KINDERGARTEN THE NEW FIRST GRADE? THE CHANGING NATURE OF KINDERGARTEN IN THE AGE OF ACCOUNTABILITY

Daphna Bassok & Anne Rorem

In 2009, the Alliance for Childhood released a report entitled “Crisis in the Kindergarten: Why Children Need to Play in School” (Miller & Almon, 2009). The report warned that kindergarten in the United States has radically changed over the past two decades, and that “developmentally appropriate learning practices” centered on play, exploration and social interactions have been replaced with highly-prescriptive curricula, test preparation and an explicit focus on academic skill-building. It then cautioned that these trends have serious implications for children’s development and called for a “reversal of the pushing down of the curriculum that has transformed kindergarten into de facto first grade” (Miller & Almon, 2009, p. 63).

Over the past ten years, major news outlets have run stories with titles such as “Kindergarten Cram,” “The New First Grade: Too Much Too Soon” “More Work, Less Play in Kindergarten” and “Kindergarten or `Kindergrind?’” (Gao, 2005; Orenstein, 2009; Stenson, 2010; Tyre, 2006; Vise, 2007). These articles generally align with the crisis narrative, providing accounts of kindergarten classrooms characterized by mounting homework demands, worksheets, pressure to learn to read as early as possible, and heightened levels of stress.

Despite these headlines, there is very little empirical evidence about whether kindergarten classrooms have actually changed over time. This is, however, an important question as in addition to the lore around the changing nature of kindergarten, a large body of research suggests that there are meaningful, long-term implications to the way early childhood classrooms are structured and taught (Chetty et al., 2011; Claessens, Engel, & Curran, 2013; Pianta, La Paro, Payne, Cox, & Bradley, 2002). This paper aims to fill this gap, describing changes in public school kindergarten classrooms over time using two large nationally-representative datasets. We focus on four key dimensions of the kindergarten experience: (1) teachers’ beliefs about school readiness and kindergarten learning; (2) time allocated to core subjects; (3) curricular coverage and; (4) assessment practices. We then document systematic changes in kindergarten classrooms between 1998 and 2006, and assess the extent to which kindergarten classrooms in 2006 resemble *first grade classrooms* in the late nineties.

The national datasets we leverage straddle the introduction of the Federal No Child Left Behind Act (NCLB) signed in 2002 and therefore allow us to describe changes in kindergarten practices during a period characterized both by heightened accountability pressure and by increased investment in early childhood education (Hustedt, Friedman, & Barnett, 2012; Reardon, 2011). Our results indicate substantial changes in the kindergarten experience along nearly every dimension we explore. First, teachers' expectations for kindergarteners have escalated rapidly. For instance, over this time period the percentage of teachers who indicated that *incoming* kindergarteners need to know most of their letters or count to twenty doubled. Similarly, while in 1998 under a third of kindergarten teachers agreed that children should learn to read in kindergarten, by 2006 this percentage more than doubled to 65 percent.

In addition, we find that time spent on reading and language arts rose by about 25 percent from roughly 5.5 to 7 hours per week. This change is likely driven in part by a substantial increase over this same period in children attending full-day kindergarten, from about 56 to 75 percent (Flanagan & McPhee, 2009; Walston & West, 2004). However, despite this increase in the overall time kindergartens are spending in school, we find no change in time spent on mathematics instruction and actually document significant *drops* in time spent on social studies, science, music, art and physical education instruction. We discuss the factors that likely contributed to these substantial changes, as well as their implications for public policy and learning.

Kindergarten Classrooms and Early Learning

A large body of evidence demonstrates that children's early childhood learning environments have large impacts on both short and longer-term life outcomes (Barnett, 1995; Chetty et al., 2011). It is less clear precisely how classrooms serving young children should be organized (e.g., what material should be covered and how) in order to yield the greatest learning gains. In particular, there is substantial and longstanding debate among parents, educators, researchers and policy makers about the potential benefits and risks of orienting early childhood learning experiences more squarely towards academic content (Duncan, 2011; Elkind & Whitehurst, 2001; Zigler & Bishop-Josef, 2006; Zigler, 1987).

One major concern is that a focus on academic content will crowd out other important types of learning experiences that help develop social and regulation skills or foster physical and mental health, each of which are predictors of children's longer term outcomes (Datar & Sturm,

2004; Raver & Knitzer, 2002; Shonkoff & Phillips, 2000; Stipek, 2006). This concern is particularly salient in recent discussions of the Common Core Standards, which provide detailed academic content standards for all grades including kindergarten. For instance, Robert Pianta, Dean of the Curry School of Education at the University of Virginia warned that, “we have to be careful that those standards, particularly as they extend downward, appropriately recognize these important social, communication, and self-regulation skills that are really as critical for kids' learning in those early and later years as whether they know the alphabet” (Zubrzycki, 2011).

Another distinct but related issue raised by some educators and psychologists is that developmentally, many kindergarten-aged children may not be ready for highly academic content or very structured learning experiences (Copple & Bredekamp, 2009). In the late eighties, the National Association for the Education of Young Children (NAEYC), a professional and accreditation organization for early childhood programs, expressed concern over the perceived mounting academic demands in early childhood classrooms and called for more child-oriented, play and discovery-based instruction. They released an influential handbook of guidelines for “Developmentally Appropriate Practices” (DAP) a term defined as “an approach to teaching grounded in the research on how young children develop and learn and in what is known about effective early education” (Bredekamp, 1987). The guidebook has undergone revisions twice since its initial publication reflecting, in part, that over the past two decades our understanding of young children’s development has improved rapidly, as has our knowledge around processes that support early learning.

Researchers have examined the impacts of many aspects of early childhood classrooms including play-based curriculum, didactic versus more child-oriented teaching practices, half versus full-day kindergarten and high-stakes testing, among others (Gersten, 1988; Gibbs, 2012; Marcon, 1993; Meyer, 1984; Phillips & Stipek, 1993; Schultz & Kagan, 2007). A number of studies have suggested that academic, didactic or “developmentally inappropriate” kindergarten experiences are negatively associated with children’s learning outcomes (Huffman & Speer, 2000; Marcon, 1999; Stipek, Feiler, Daniels, & Milburn, 1995). Stipek (2006), for example, suggests that a heightened focus on academics may be stressful for children and negatively impact their motivation, self-confidence and attitudes towards school.

On the other hand, there is also evidence that exposure to academic content in kindergarten (and particularly to advanced content) can be beneficial for student learning

(Claessens et al., 2013). Magnuson, Ruhm & Waldfogel (2007) show that more academically-oriented early elementary experiences can help children who did not attend preschool catch up with their peers. A number of recent papers show that children’s academic skills at school entry—particularly their math skills—are the strongest predictors of their later performance on a number of cognitive and non-cognitive outcomes (Claessens, Duncan, & Engel, 2009; Claessens & Engel, 2013; Duncan et al., 2007). The authors interpret these findings as suggestive evidence that early childhood interventions that focus on academic skill building might be particularly effective in improving children’s long-term learning outcomes, especially for low-income children.

The Changing Nature of Kindergarten

Historical accounts of kindergarten education make it clear that the acute tensions between the academic and more broad developmental goals of kindergarten are not new (Dombkowski, 2001; Russell, 2011). Cuban (1992) details the ebbs and flows of these two competing foci for kindergarten over more than a century. That said, there is a growing impression among practitioners, researchers and the media that in the past two decades preschool and kindergarten classrooms have rapidly become more academically-oriented and that this change is explained, at least in part, by heightened accountability pressures due to NCLB (Goldstein, 2007; Graue, 2009; Pianta, Cox, & Snow, 2007; Stipek, 2006). While NCLB does not require testing for children before the third grade, it is argued that the intensive pressures that principals and teachers feel about their students’ performance on high-stakes assessments have led to an “accountability shovedown” and the “educationalization of early care and education” (Hatch, 2002; Kagan & Kauerz, 2007)

Large-scale empirical evidence about the changing nature of kindergarten over the past two decades is lacking, as is research causally linking heightened accountability pressure and changes to the early childhood curriculum. Miller & Almon (2009) describe findings from a survey of approximately 250 kindergarten teachers in Los Angeles and New York City, which shows that teachers feel lack of time, curricular demands, and limited support from principals lead them to focus primarily on literacy and mathematics skill-building rather than play. Russell (2007) uses information about the strength of states’ accountability systems in the pre-NCLB period and finds some evidence that teachers in states with more binding early accountability systems report more

time spent on literacy skills. While the results of these two studies are intriguing, both make use of a single cross-section of data making any discussion of *changes* in the academic nature of kindergarten in recent years impossible.

Empirical evidence about the impacts of NCLB or accountability pressures more broadly on the experiences of students and teachers working in the untested early grades has also been limited. Jacob (2005) finds some evidence that high-stakes accountability leads children in early, untested grades to be “preemptively retained” so that they will not be included in standardized test scores. Similarly, in her case study of a Texas elementary school, Booher-Jennings (2005) describes the intense pressure teachers in the untested early grades (K-2) felt to prepare their students for third grade assessments. In this school, recess was reduced to 15 minutes *per week*, despite the concerns of early childhood teachers in the school. In a recent study, Grissom, Kalogrides & Loeb (2014), show that low-performing teachers in high-stakes grades are disproportionately reassigned to untested early elementary classrooms, and demonstrate that these transfers of ineffective teachers into the early grades negatively impact those children’s learning. Taken together, these findings are consistent with the notion of a “trickling down” of accountability pressures leading to changes in the kindergarten classroom.

Other societal shifts over the same period may have also contributed to a heightened focus on more advanced or academic content. There have been substantial increases in both public and private investments in early childhood education. Between 1990 and 2011, the number of 3-5 year olds enrolled in public preschool programs more than doubled from 1.2 to 2.9 million children (Current Population Survey, 2011). Further, a number of scholarly and popular accounts have documented increases in parental investments in their young children’s learning as well as heightened pressure among some parents to give young children an academic edge (Bassok & Reardon, 2013; Otterman, 2009; Ramey & Ramey, 2010; Reardon, 2011). Given these trends, it is also plausible that incoming kindergarteners are now entering school with more exposure to academic skills than they once were and that, in part, this is driving kindergarten teachers to change their practices.

The Current Study

The existing research demonstrates the link between early childhood learning and later life outcomes, and suggests that the content and organization of early childhood classrooms

meaningfully impacts young children’s learning. While it is commonly noted that kindergarten classrooms have changed rapidly over the past decades, there is little empirical evidence of exactly how much and along what dimensions classrooms have changed over time. The current study fills these gaps, leveraging rich, nationally representative datasets to provide the first detailed account of the changing kindergarten experience. We focus on changes over a relatively short period of time, but also a period characterized by heightened accountability as well as increased investment in early childhood education. We address three descriptive research questions:

1. To what extent and along what dimensions has the kindergarten experience changed between 1998 and 2006?
2. To what extent did kindergarten classrooms in 2006 resemble *first grade* classrooms in the late nineties?
3. Are changes in the kindergarten experience over this period systematically different in schools serving high proportions of non-white students or high proportions of students eligible for FRPL?

We hypothesize that due to heightened accountability pressure, kindergarten classrooms in 2006 will be more academically oriented than in 1998. We expect to see increases in time spent on literacy and math, the subjects tested on high-stakes exams. We also anticipate drops in other topics such as art, music and physical education due to crowding out from time spent on tested academic subjects. However, our expectations are somewhat ambiguous, since the increase in enrollment in full day kindergarten may have led to more time spent across all subject areas.

Relatedly, we expect to see heightened expectations for incoming kindergarteners, more advanced curriculum presented and, in general, a kindergarten experience that is more similar to first grade in the late nineties than it is to kindergarten during that period. Because schools and teachers serving high-proportions of low-income and non-white students are more likely to find the high-stakes associated with accountability binding, we posit that changes will be particularly pronounced in those settings.

Method

Data

This study leverages data from the birth and kindergarten cohorts of the Early Childhood Longitudinal Study (ECLS-B and ECLS-K), each of which include a detailed kindergarten teacher

survey and therefore allow for a rich account of changes between 1998 and 2006 in public school kindergarten teachers' beliefs about school readiness and kindergarten learning as well as their time use, curricular focus, and assessment practices.

The ECLS-K tracks a nationally representative sample of over 20,000 children who were kindergarteners in the fall of 1998 from school entry through the eighth grade. The study employs a multistage probability sample design with children selected within schools, which were first selected from groups of counties. All kindergarten teachers in the sampled schools completed a detailed questionnaire about their classroom practices, irrespective of whether or not they taught one of the sampled children. This design yielded a sample of approximately 2,800 public-school kindergarten teachers and provides a representative sample of all kindergarten teachers in the United States in 1998. In 1999, when most ECLS-K children proceeded to the first grade, their first grade teachers were surveyed as well. We leverage the responses from nearly 3,500 first grade teachers to assess the extent to which kindergarten in 2006 mirrored first grade in 1999.

Whereas the ECLS-K tracks a *grade* cohort of kindergarteners, the ECLS-B follows a nationally-representative *age* cohort of infants from their birth in 2001 until they enter kindergarten. Due to states' birthday cut-offs for kindergarten entry as well as parents' decisions to delay kindergarten, not all children in the dataset begin formal schooling at the same time (Bassok & Reardon, 2013). About 75 percent of ECLS-B children entered kindergarten in the fall of 2006, and the remaining children begin the following year (fall, 2007). In the year that a child began kindergarten, his teacher was asked to complete a detailed survey. We combine the teacher survey data from both years (2006 and 2007) to construct a "simulated" kindergarten cohort comprised of more than 4,000 public-school kindergarten teachers which we refer to as the 2006 cohort of teachers.¹

Measures

A large portion of the teacher survey items are identical across the ECLS-B and ECLS-K teacher surveys, making comparisons across the two datasets straight-forward.^{2,3} Rather than focusing on a single, narrow measure of increased academic focus, we take advantage of the detailed nature of the teacher surveys to consider a broad set of teacher-reported outcomes which we group into four categories, described in some detail below. These categories are: school

readiness beliefs and kindergarten expectations, time use, curricular content and assessment practices.

School readiness beliefs & kindergarten expectations. Teachers were asked to assess the extent to which they agree with a number of statements regarding “school readiness” and kindergarten learning expectations. We report the percentage of teachers who either “agree” or “strongly agree” with the following four statements:

- a. *Attending preschool (for example, nursery school, prekindergarten, or Head Start) is very important for success in kindergarten.*
- b. *Children who begin formal reading and math instruction in preschool will do better in elementary school.*
- c. *Parents should make sure their children know the alphabet before they start kindergarten.*
- d. *Most children should learn to read in kindergarten.*

These items were chosen to track the extent to which kindergarten teachers support early introduction to academic content.

We also track teachers’ responses to a series of 13 items asking them to assess how important they believe certain characteristics are for a child’s school readiness (e.g., counting to 20, sitting still, and being sensitive to other children’s feelings.) We group these into pre-academic skills, regulation skills, and other skills, and report the percentage of teachers who deem these skills either “very important” or “essential.”

Time use. Teachers were asked to report the amount of time, measured in both days per week and hours per day, they devote to various subjects. We combine these responses to construct variables measuring the number of *minutes per week* devoted to four subject areas: (1) reading and language arts (ELA); (2) mathematics; (3) social studies and science; and (4) music and art.^{4,5} Survey items specifically indicate that time spent on activities that fall into multiple categories can be counted towards all relevant categories. For instance, an activity that combines reading and social studies should be reported under both topics. This is important because it implies that increases in one category do not necessarily imply drops in another and that if, for example, literacy lessons are infused throughout the curriculum, it would not necessarily lead to a drop in the reporting of other topics.

In addition to these subject-specific time-use measures, we also consider three measures of exposure to physical education (PE). The first two are the percentage of kindergarten teachers who

report their students typically participate in PE *daily* and the percentage who indicates their students *never* have exposure to PE. Among those teachers who report their students had at least some exposure to PE, we also look at the percentage who indicates the typical PE session was longer than 15 minutes.

Our final set of time-use measures relate to instructional approach. Specifically, we report the percentage of teachers who indicate that on a typical day their students spend about an hour or more on “child-selected activities” and the percentage who indicates they spend three hours or more on “teacher-directed whole class activities.”

Curricular coverage. In addition to items about aggregated time use, teachers were also asked to describe how often they do specific ELA and mathematics activities. In each subject, the skills range from fairly simple (e.g., alphabet and letter recognition) to complex (e.g., composing and writing stories with an understandable beginning, middle and end). We report the percentage of teachers who indicated doing particular skills daily, at least once a week, and never. An advantageous feature of the ECLS-K survey for the purpose of this study is that in 1998 teachers could specify that an activity never happened because it is “taught at a higher grade level.” This allows us to describe the extent to which skills that were considered outside the scope of kindergarten by a substantial portion of kindergarten teachers in 1998 are reported as commonplace by kindergarten teachers in 2006.

The survey also asked teachers to indicate whether a number of science and social studies are taught in their kindergarten classroom (e.g., human body, dinosaurs and fossils, important figures in American history, etc.).⁶ We examine whether there was a change in the likelihood these topics were covered during the kindergarten year.

Assessment practices. Our final set of outcome measures relates to the use of assessment practices. We consider three items. The first asks teachers about their evaluation practices and how important they consider an “individual child’s achievement relative to local, state, or professional standards.” We look at the percentage of teachers who indicate this measure is “very” or “extremely” important. Teachers are then asked whether they have the same evaluation practices for all children in their class. Specifically, teachers are asked whether they: (1) “hold the same standards for all children”, (2) “hold the same standards for *most* children but make exceptions for children with special needs (for example, children with disabilities, children with limited English proficiency)”, or (3) “hold different standards for different children based on what I think they are

capable of.” Accountability, state standards, and similar expectations for all children (and subgroups), were all hallmarks for the NCLB Act. Therefore, if accountability pressures have trickled down into untested grades, we would expect an increase in the percentage of teachers who view standards to be very important and an increase in the percentage of teachers reporting holding the same standards for all children.

In 2006, kindergarten teachers were asked how often they use various tools to assess their students. Unfortunately, no comparable items exist in the ECLS-K kindergarten survey. However, in 1999, when the ECLS-K children entered first grade, their first grade teachers were asked identical questions about assessment practices. We compare the frequency with which kindergarten teachers in 2006 use state or local standardized tests to assess their students, to the accounts provided by first grade teachers in 1999.

School and Teacher Characteristics. Our third research question examines whether changes over time in kindergarten practices differed depending on schools’ demographic composition, and we focus in particular on schools with high percentages of students eligible for free or reduced priced lunch (FRPL) and schools serving high percentages of non-white students. The restricted access versions of the ECLS-B and ECLS-K allow researchers to match each teacher to detailed information about their schools by linking the datasets to the National Center for Education Statistics Common Core of Data Public School Universe surveys (CCD), which contain information about all NCES-registered public schools in the United States.⁷ We construct indicators to designate schools in the top quartile with respect to the percentage of children eligible for FRPL as well as the top quartile with respect to the percentage of non-white children.

In our regression analyses we control for a number of school and teacher characteristics that may be associated both with the schools’ demographic composition as well as with teachers’ beliefs, time-use, and practices. In particular, our models control for school size, urbanicity and region. We also control for whether or not the school offers a preschool program, as schools that provide early childhood education programs may have systematically different approaches to their kindergarten curriculum.

The models also include covariates available directly through the ECLS datasets. Most importantly, we account for whether the teacher works in a half or full-day kindergarten classroom. This is a critical covariate because time-use variables differ significantly across these settings and because there has been a substantial shift towards full-day programs over the period examined. To

ensure a consistent definition of full-day care across waves, we constructed an indicator set to one if the class met for more than 4.5 hours per day.⁸ Finally, we control for the experience level of the teacher, defined as an indicator set to one if the teacher is in her first three years of teaching.

Analytic Plan

Our paper addresses three overarching research questions: To what extent and along what dimensions has the kindergarten experience changed between 1998 and 2006?; To what extent did kindergarten classrooms in 2006 resemble *first grade* classrooms in the late nineties? and; Are changes in the kindergarten experience over this period systematically different in schools serving high proportions of non-white students or high proportions of students eligible for FRPL?

To address the first question we present descriptive statistics highlighting how kindergarten teachers' descriptions of their classrooms have changed over a roughly eight year period. While the two datasets leveraged in the current study do not track the same teachers or schools, and therefore do not allow us to assess whether individual teachers changed their own practices or beliefs over this time period, we are able to describe the extent to which two kindergarten teaching cohorts resemble one another.⁹ We use a similar descriptive approach to address our second research question which aims to directly explore the question raised in the paper's title: "Is kindergarten the new first grade?" Here we compare the responses of kindergarten teachers in 2006 to those given by first grade teachers in 1999.

Over the time period considered there was also a substantial shift towards full-day kindergarten. This shift is relevant for our analysis because any changes we observe in our outcome variables, particularly our measures of time spent on particular subjects, may, in part, be driven by the shift towards full day programs. In other words, students may spend more time on reading because they spend more time in school. To address this we run our analyses separately for full and half day programs.

In a final set of analyses we investigate the relationship between kindergarten teachers' beliefs and practices and the demographic composition of the school where they teach. To do this we run models that take the form:

$$K \text{ Practice} = \beta_0 + \beta_1 K2006 + \beta_2 FRPL + \beta_3 FRPL * K2006 + \beta_4 School + \varepsilon$$

where our outcome ($K_Practice$) is one of ten measures of the kindergarten experience ranging from teachers' beliefs about school readiness to their focus on assessment. $K2006$ is an indicator variable

set to one if the responding teacher is part of the 2006 sample (ECLS-B) and zero if they are from the 1998 sample (ECLS-K). *FRPL* is another dichotomous variable indicating whether the school where the teacher works is in the 25th percentile with respect to free and reduced price lunch (FRPL) eligibility. The coefficient β_3 measures the strength of the interaction between these two dichotomous variables. In other words, if β_3 is positive and significant, our results suggest that the changes in *K_Practice* between 1998 and 2006 were more pronounced in schools serving high percentages of children eligible for FRPL. *School* is a set of school-level covariates as discussed above. β_0 is a constant term and ε is a stochastic error term. We also run identical models, but replace FRPL with an indicator set to one for schools in the top quartile with respect to percentage of non-white students.

Results

Differences in Kindergarten 1998-2006

Nearly all outcomes we examined changed substantially over the study period and our findings are consistent with a narrative of heightened focus on academic instruction, and particularly literacy, during the kindergarten year. Below we describe the trends for our four sets of outcomes.

Teacher beliefs. The top panel of Table 1 shows the percentage of teachers who “agree” or “strongly agree” with a set of statements about school readiness and kindergarten learning. Strikingly, the percentage of teachers who believe “most children should learn to read in kindergarten” has more than doubled over the time period from 31 to 65 percent. We also see substantial increases (between 15 and 22 percentage points) in the percentage of teachers who think “parents should make sure their children know the alphabet before they start kindergarten” and that “children who begin formal reading and math instruction before kindergarten will do better in elementary school.” These patterns suggest that in 2006 public-school kindergarten teachers believe that children should be introduced to academic content earlier than they did in 1998.

The bottom panel of the table shows the percentage of teachers that believe a diverse set of skills and characteristics are either “very important” or “essential” for school readiness. The first thing to note is that in 2006 teachers rated *all* of the 13 characteristics—both academic and non-academic—as more important than did kindergarten teachers in 1998. We categorized three items (knowing letters, identifying colors and shapes, and counting to 20) as pre-academic skills and found substantial increases on these measures. For instance, while 19 percent of teachers reported that

knowing the alphabet was very important or essential in 1998, in 2006 42 percent did so. The percentage who indicated color and shape identification was important rose by 18 percentage points and there was a 15 percentage point increase in teachers rating counting skills as important. We see much smaller increases in the percentage of teachers who rate regulation skills (e.g., following directions, sitting still, finishing tasks, etc.) in this way.

Again, these trends are consistent with a pattern of heightened emphasis on early academic skills. However, it is worth noting that in both periods the three academic skill items were among the lowest ranked skills. In other words, while the percentage of teachers that believe that the academic characteristics are important has grown rapidly, far out-pacing changes on other school readiness dimensions, teachers were still much more likely to identify regulation ability and social skills (for instance the ability to communicate, not disrupt, and share) as most critical at school entry.

Time use. While we posit teachers' beliefs about school readiness are related to their approaches to teaching, their self-reported measures of time use are more likely to capture children's day-to-day classroom experiences. Table 2 presents average time spent on academic as well as non-academic subjects, and also shows time spent on child-selected activities and teacher-directed whole class instruction. The upper left-hand portion of the table shows the amount of time teachers reported they spent on ELA, mathematics, social studies and science, and music and art. In 1998, teachers reported spending about 328 minutes per week, or just over an hour a day, on reading and language arts. In 2006 this figure rose by about 25 percent to 414 minutes per week (or about 17 additional minutes per day). In contrast, teachers reported almost exactly the same time allocated to mathematics across the two waves of data.

Time spent on all other subjects dropped. On average, teachers reported spending 46 minutes per week less on social studies and science in 2006 than they did in 1998, dropping by approximately 30 percent from 149 to 103. Time devoted to music and art also dropped by about 30 minutes per week. Taken together, these teacher reports show that kindergarteners in 2006 spent as much time on reading and language arts as they did on mathematics, science, social studies, music and art *combined*. In considering the implications of these drops, it is worth emphasizing again that the wording of the teacher surveys did not require teachers to classify their time as *either* one subject *or* another. A lesson that combined literacy and science, for example, could be counted towards both categories. Therefore, the drop observed in these subjects is unlikely to be driven by teachers simply re-classifying activities they once considered science or social studies activities as literacy.

Further, our results are not entirely driven by the shift towards full day kindergarten over the time period we study. We know that between 1998 and 2006 there was a substantial increase in full rather than half-day enrollment in kindergarten from 56 to 75 percent (Flanagan & McPhee, 2009; Walston & West, 2004). We therefore disaggregate our time use analysis by length of day, noting that children enrolled in full day kindergarten spent significantly more time on *all* the subjects we consider. The second and third panels of Table 2 show that the pattern of results seen in the full sample is also present in the half and full day subsamples. In both settings we see substantial increases in ELA and drops in time spent on social studies, science, music and art. Moreover, while for the full sample we did not observe an overall change in time spent on mathematics, in half-day programs we actually find a drop of 31 minutes (or about a 20 percent drop) off the baseline of 156 minutes.

Items assessing time spent on physical education (PE) are asked slightly differently, and we present those separately. About 19 percent of kindergarten teachers in 1998 reported that their students usually have PE daily. By 2006, this percentage dropped in half to roughly nine percent. Conversely, the percentage of teachers reporting their kindergarteners *never* have PE more than doubled from 9 percent to 19 percent. A separate item asks teachers who indicated their students had at least some exposure to PE to report the number of minutes of PE kindergarteners experience in a typical session. In 1998, 85 percent of kindergarten teachers reported that the typical PE session was longer than 15 minutes. By 2006, this figure fell sharply to 44 percent.

The drop in both frequency of PE sessions and time spent per session is particularly striking in light of the fact that many more children are attending full-day kindergarten. Again, the second and third panels of Table 2 demonstrate that both full and half-day programs saw substantial drops in PE. The drops for half day programs are particularly large. In 2006, only 3 percent of kindergarten teachers in half day programs reported that their students had PE daily, and the percentage who reported their students never had PE tripled from 14 to 45 percent. Of those half-day teachers who reported at least some exposure to PE, the percentage who reported the typical session was more than 15 minutes long dropped drastically from 71 to 18 percent. These results are *conditioned* on teachers reporting that their students *ever* experience PE (teachers who reported never having PE are excluded from these percentages). Therefore, the figures actually overstate the overall percentage of children who have PE sessions longer than 15 minutes.

The final rows of Table 2 show changes in instructional approach. In 1998, 56 percent of kindergarten teachers reported that children in their class typically spend more than an hour a day on child-selected activities. By 2006, this figure dropped to 33 percent. There was also a 5 percentage point increase in teachers reporting that children typically spend three or more hours on teacher-directed whole group instruction. Again, the drop in child-selected activities is somewhat surprising, as we might expect that the shift towards full-day kindergarten would allow for more time on *all* instructional approaches. Our results actually show that in full day kindergartens, the percentage of classrooms with long blocks of teacher-directed instruction increased (from 22 to 29 percent) while the percentage with daily exposure to more than an hour of child-directed activities fell significantly (from 71 to 43 percent).

Curricular coverage. In addition to reporting the overall amount of time they devote to language arts and mathematics, teachers were asked to report the amount of time they devote to specific curricular content. Table 3 shows teachers' responses about ELA and Table 4 shows responses for mathematics. Teachers were asked to provide their best estimate of how often they do 15 ELA skills considering the school year as a whole. The percentage of teachers reporting they teach a particular skill daily went up for *all 15* of the items considered. For instance, the percentage of teachers who worked with children *daily* on "rhyming words and word families" rose from 25 to 36 percent. Daily lessons on following multi-step directions rose from 61 to 73 percent.

In 1998, respondents could indicate that a particular topic was never taught because it was introduced at a later grade. We designate topics that at least 15 percent of teachers indicated were not taught until a later grade as "advanced." There are four ELA skills that were categorized this way: vocabulary, composing and writing complete sentences, conventional spelling and composing and writing stories with an understandable beginning, middle and end. In 2006, teaching each of these skills is much more commonplace. For instance, while in 1998 45 percent of teachers indicated they *never* taught conventional spelling in kindergarten, in 2006 this figure dropped to 13 percent. The percentage who indicated they taught conventional spelling *daily* doubled from 18 to 36 percent, and three quarters of teachers reported teaching conventional spelling at least once a week.

Teachers' reported time-use on mathematics content also suggests an increase in the time spent on skills that were previously deemed too advanced for kindergarten. For instance, while in 1998 60 percent of kindergarten teachers reported they did not teach students to write "math

equations to solve word problems” this figure dropped to 38 percent in 2006, and the percentage that said they taught this topic at least weekly rose from 15 to 22. Similarly, 61 percent of ECLS-K teachers reported that they did not teach children how to estimate probability and this figure fell to 28 percent among ECLS-B teachers. That said, the patterns in math seem less consistent and smaller in magnitude than those reported for ELA. For example, there was a modest *drop* in the percentage of teachers reporting doing some math skills daily (i.e. counting beyond 100, adding single-digit numbers and reading three-digit numbers).

The ECLS-B did not include items comparably assessing days per week spent on specific science and social studies activities. However, in the first three columns of Table 5 we compare the percentage of teachers reporting they cover a number of science and social studies topics in the current school year. We observe a significant drop in all but 2 of the 15 science topics included in the survey. The percentage of teachers who report teaching about ecology, dinosaurs, sound, light, tools, the social system and machines each dropped by over 20 percentage points. Similarly, we observe significant drops in all seven of the social studies topics included, though the drop in social studies coverage is smaller in magnitude. For instance, we see an 18 percentage point drop in geography and a 14 percentage point drop in lessons about different cultures.

Assessment. Finally, in the top panel of Table 6 we show how kindergarten teachers’ views about assessment have changed over time. Here too we observe substantial changes. The percentage of teachers that indicated they consider an individual child’s achievement relative to local, state, or professional standards “very important” or “essential” rose from 57 to 76 percent. In 1998, most teachers (57 percent) indicated they *held the same standards for most children but made some exceptions*. The size of this group did not change across the study period. However, while 17 percent of teachers in the earlier period indicated they held the same standards for all of their students, this figure rose to 26 percent in 2006. Conversely the percentage that indicated they held different standards for children based on what they think they are capable of fell from 26 to 16.

Kindergarten as the New First Grade?

Our descriptive analysis thus far demonstrates substantial changes over the eight year period examined across all four sets of outcomes considered. Kindergarten teachers in 2006 held higher expectations for their students, they spent more time on ELA, and many of the skills they reported teaching on a daily or weekly basis, had been designated as too advanced for kindergarteners in the

previous period. In this section we explore the question raised by the paper’s title, assessing the extent to which kindergarten in 2006 mirrored first grade classrooms in 1999.

Figure 1 shows the amount of time spent on ELA, math, social studies and science, and art and music for three groups of teachers: kindergarten teachers in 1998, kindergarten teachers in 2006 and first grade teachers in 1999. For each subject we examine whether the middle bar, which represents kindergarten teachers’ responses in the more recent period, is more similar to the responses of kindergarten or first grade teachers from the late nineties. We first note that during the earlier period, first grade teachers reported spending significantly more time than kindergarten teachers on all academic topics (ELA, math, and social studies and science), but somewhat less time than kindergarten teachers on art and music.

In some ways, kindergarten classrooms in 2006 do, in fact, look more like first grade classrooms in the late nineties than they do kindergarten classrooms. Specifically, the increase in time spent on ELA as well as the drop in time spent on art and music, are more aligned with the time-use patterns reported by first grade teachers, and these patterns remain even if we limit our analysis to full-day kindergarten classrooms (not shown).

Notably, however, the drop in time spent on social studies and science does not mirror the responses given by first grade teachers. In other words, the amount of time spent in kindergarten on social studies and science in 2006 is significantly *lower* than what was spent on these topics in the late nineties by *either* kindergarten or first grade teachers. As demonstrated in the final two columns of Table 5, the drop in science and social studies topical coverage (e.g., dinosaurs, solar systems, or geography) also does not align with the “kindergarten as the new first grade” narrative, as first grade teachers’ responses to these items were far more similar to those given by kindergarten teachers in 1998 than they were to kindergarten teachers in 2006.

This pattern is echoed in Figure 2 which shows the percentages of teachers who reported their students did not have regular exposure to physical education. Here too, we see that the doubling in the percentage of teachers reporting no regular PE time actually represents a shift away from *both* kindergarten and first grade classroom norms in the late nineties. Only 2 percent of first grade teachers reported their students had no regular exposure to PE, compared to 9 percent of kindergarten teachers in 1998 and 19 percent of kindergarten teachers in 2006.

Finally, the bottom panel of Table 6 compares the frequency of standardized testing reported by kindergarten teachers in 2006 and first grade teachers in 1999.¹⁰ We find that in 2006 a

quarter of kindergarten teachers report using state or local standardized tests once a month or more. In comparison, only 11 percent of *first grade teachers* in 1999 reported using standardized tests this frequently.

Taken together, the results suggest that characterizing kindergarten in 2006 as “the new first grade” does not accurately capture the full scope of the changes to the kindergarten classroom. We find that kindergarten classrooms in 2006 had much less exposure to PE and social studies and science than did first grade classrooms in 1999, and kindergarten teachers were conducting far more standardized testing than were first grade teachers in the earlier period.

Differences in Kindergarten across Schools

In the final results section we examine whether the changes documented thus far were more pronounced in particular school settings, focusing in particular on schools serving high proportions of students eligible for free or reduced-price lunch (FRPL) and schools serving high proportions of non-white students. Table 7 presents the unadjusted means for ten key outcome measures in 1998 and 2006, disaggregated by schools’ demographic composition. The top panel presents results about teacher beliefs and accountability practices. The first thing to note is that in 1998, teachers working in schools serving high percentages of students eligible for FRPL or high percentages of non-White students report much higher expectations around academic skills, and are more likely to be focused on standards and accountability than are other schools. For instance, in 1998, 41 percent of teachers in schools with the highest proportions of students eligible for FRPL reported that children should know the alphabet before entering kindergarten and 44 percent indicated children should learn to read in kindergarten. This is in contrast to 26 and 27 percent of teachers in schools with lower percentages of students eligible for FRPL.

By 2006, teachers working in schools serving high percentages of students eligible for FRPL or high percentages of non-White students were still more likely to hold higher expectations around academic skills and to be more focused on standards and accountability. However, the gap between these schools and comparison schools actually narrowed somewhat. In other words, while both groups experienced large increases in focus on academics and accountability, the changes were somewhat *more* pronounced in the schools that were not serving the highest proportions of non-white children or children eligible for FRPL.

The bottom panel of Table 7 shows the disaggregated results for time use. Again, we see that in 1998, teachers working in schools serving high percentages of students eligible for FRPL or high percentages of non-White students reported spending more minutes per week on ELA and math than their counterparts in other schools. For instance, teachers working in schools in the top quartile with respect to students eligible for FRPL spent about 20 minutes per week more on both ELA and math. Whereas the top panel of Table 7 suggested some narrowing of gaps between 1998 and 2006, gaps in time spent on academics increased. On average, both groups increased time spent on ELA. However, in schools in the top quartile with respect to FRPL eligibility the increase was substantially larger. We find that while in schools serving the highest proportions of non-white students time spent on math increased by roughly a half an hour a week, in other schools time spent on math actually dropped slightly.

In Table 8 we present results from multivariate models exploring whether these patterns persist after controlling for a host of school and teacher characteristics. We present results from regression models predicting the same 10 outcomes based on an indicator for the schools demographic make-up, an indicator for the ECLS-B (2006) wave and an interaction term between the ECLS-B indicator and demographic control. All models also include the full set of school and teacher controls (e.g., preschool availability, teacher experience, full day schedule, etc.). In the top panel of Table 8, the constant term represents the adjusted mean value of each outcome variable in 1998, for schools that *are not* in the top quartile with respect to serving students eligible for FRPL. The “High FRPL eligibility” coefficient measures the extent to which schools with high proportions of FRPL differed on the outcome variable in 1998. The coefficient on “2006” describes the average change in the outcome variable for the higher SES schools, and the interaction term measures whether the magnitude of the changes differed at schools serving the most students eligible for FRPL.

Our results suggest that while the number of minutes per week spent on reading and language arts increased in all schools, in schools serving the most students eligible for FRPL time devoted to this subject increased by about 18 minutes more per week. The results also suggest these schools saw a larger drop in time spent on PE and time spent on Art and Music, although the latter is not statistically significant. Notably, for all other outcomes, the coefficient on the interaction term has the opposite sign relative to the main “2006” coefficient, though in most cases these coefficients are not statistically significant. In other words, the results suggest that many of the changes

described in the paper were *less pronounced* in low-SES schools relative to other schools. Given that these schools were more likely to report higher levels of these measures in 1998, the multivariate results again provide suggestive evidence of some narrowing in the gap between low and higher-SES schools with respect to academic expectations and focus on accountability.

The results in the lower panel of Table 8, which look at differential change patterns for schools serving high percentages of non-white students, largely echo these patterns. Here too we observe that high-minority schools experienced a larger increase in time spent on reading than did other schools. Further, in these schools we also see a significant *increase* in time spent on math. This is in contrast to schools with lower percentages of non-white students where we actually observe a significant decline in time spent on math.

Discussion

Our study is the first to document striking increases along a large number of teacher-reported measures of “academicization” in kindergarten. As hypothesized, we find strong evidence that, relative to their counterparts in 1998, kindergarten teachers in 2006 are far more likely to believe that academic instruction in literacy and mathematics should begin in the preschool and kindergarten years. They are also much more likely to expect children to enter kindergarten already knowing their letters, numbers, and colors. They expect children will leave their classrooms knowing to read.

We had hypothesized an increase in time spent on both literacy and mathematics, because these are the subjects included in the high-stakes accountability programs that were introduced over the study period. Indeed, teacher-reported time use suggests a substantial (25 percent) increase in the amount of time allocated towards reading instruction. We also observe a marked increase in curricular coverage of ELA subjects that in 1998 were considered outside the scope of kindergarten. Surprisingly, however, we do not observe a similar increase in time spent on math instruction. On average, time allocated to math has stayed relatively stable, and it actually drops somewhat in half day programs, and in schools serving fewer nonwhite students. This finding is troubling given the growing research documenting the importance of early childhood math knowledge (Claessens & Engel, 2013; Duncan et al., 2007).

Consistent with our hypotheses that a heightened focus on tested academics may crowd out other types of learning experiences, we find that time spent on subjects that are not tested as part of

NCLB (social studies, science, music, art and particularly P.E.) has dropped. These results are striking given that overall, the percentage of children enrolled in full rather than half day kindergarten programs increased substantially over this period. In addition, we see an increase in the percentage of teachers that find state and local standards very or extremely important in assessing their students and in the percentage of teachers that report holding the exact same standards for all of their students.

Our paper set out to explore whether the popular characterization of kindergarten as “the new first grade” was apt. Our results clearly demonstrate that today’s kindergarten classrooms focus on more advanced academic content, are more literacy-focused, and rely more heavily on teacher-directed whole group instruction. However, the changes we document in our study represent something other than a wholesale shifting of the first grade curriculum down by a year. In many ways, kindergarten in 2006 looks quite distinct from both kindergarten and *first grade* classrooms in the late nineties. For instance, kindergarteners in the later period are exposed to much less PE, science and social studies and much more standardized testing. These trends may be problematic, given studies documenting the beneficial impacts of PE for young children, and the challenges of appropriately using standardized testing with young children (Cawley, Frisvold, & Meyerhoefer, 2013; Datar & Sturm, 2004; Schultz & Kagan, 2007; Shepard, 1997).

The overall effect of these changes for young children is an important open question. Critics of academically-focused kindergarten caution that focusing heavily on academic content is not “developmentally appropriate.” They worry that not only will such focus fail to achieve the desired effect of improved academic outcomes, but may actually negatively impact young children’s development. Nobel laureate, James Heckman, argues that our focus on cognitive and academic skill-building in early childhood programs is misplaced, and that the long term benefits of early childhood interventions are driven through their impact on non-cognitive social and behavioral skill-building (Heckman, Krueger, & Friedman, 2004).

At the same time, recent research suggests that academic content, particularly advanced content, can improve the learning trajectories of young children (Claessens et al., 2013; Duncan, 2011). This work suggests that early childhood programs with a focus on these types of skills may actually have uniquely strong long-term impacts, particularly for low-income children who have less exposure at home to literacy and math topics.

It is important to point out, as do the researchers embedded in these debates, that teaching academic content need not be at odds with “play” and other types of pedagogical approaches considered developmentally appropriate in early childhood. While the data provided by the ECLS surveys allows for two unusually detailed snapshots of kindergarten in the United States, the data are not “fine-grained” enough to assess to what extent the heightened focus on literacy is happening in a way that is engaging and enriching to young children. Further research is needed to understand how much the large changes documented in this study impacted children’s development of both cognitive and non-cognitive skills, to understand the mechanisms for those changes and to explore their effects on achievement gaps at kindergarten entry.

¹ Due to the differences in study design, the ECLS-K provides a nationally representative sample of kindergarten teachers in 1998, whereas the ECLS-B provides a nationally representative sample of the kindergarten teachers who taught children born in 2001.

² Although many variables align perfectly across datasets, some items differed slightly with respect to response options. In such cases we recoded variables, often losing some specificity, but gaining the ability to make comparisons over time. For instance, in the ECLS-B survey teachers were often asked to write in the number of minutes they spent on specific subjects per day (e.g., 39 minutes). In contrast, in the ECLS-K teachers were asked to select from an existing set of time ranges (e.g., 31-60 minutes). We recoded the hand-entered minutes into the same time groupings to achieve consistency across data sets.

³ Another difference between the datasets worth highlighting is that the ECLS-K survey is somewhat longer and was administered as two components, with the first administered in the fall and the second in the spring. In contrast, in the ECLS-B the full survey was given to teachers in the fall of the school year. It is possible that the same kindergarten teachers would provide different responses, particularly about time-use, depending on when in the school year they were surveyed. Such a difference might bias our estimates of change over time. We hypothesize that the focus on academic components of kindergarten increases throughout the school year. If this is the case, then the difference in timing across the surveys may lead us to *underestimate* the extent to which kindergarten has become increasingly academic over time.

⁴ Although both surveys ask teachers about recess and free play, the items do not align in a way that allows comparisons over time.

⁵ To combine these variables we assign each teacher the midpoint of the range she reported. For instance, if a response indicates that science was taught 1-2 times per week, 61-90 minutes per day, then the number of minutes per week for science was given as 1.5×75 or 112 minutes. We also examine how sensitive our time use results are to alternative coding schemes, and find no meaningful differences.

⁶ Although the ECLS-K data asks teachers to specify how often they cover each of these topics, in the ECLS-B teachers are only asked *whether* they will cover them at all.

⁷ Unfortunately, ECLS-K observations do not include NCES ID numbers for the first year of data collection, though subsequent years (e.g., the first grade wave) did include this identifier. Despite this data limitation, we were able to match the vast majority of kindergarten teachers to CCD data.

⁸ Our constructed indicator is highly correlated with non-missing responses to an item explicitly asking teachers whether they teach in a full or half day program.

⁹ We use sampling weights throughout our analysis. For the ECLS-B data we use the sampling weight (WK45T0) which is designed specifically to examine teacher responses from the combined kindergarten entry data.

¹⁰ Recall that kindergarten teachers in 1998 were not asked this question.

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Figure 1

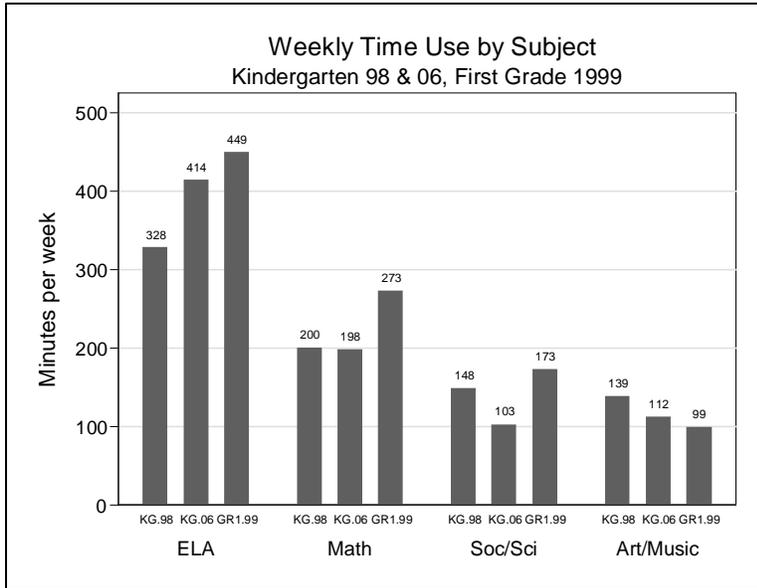


Figure 2

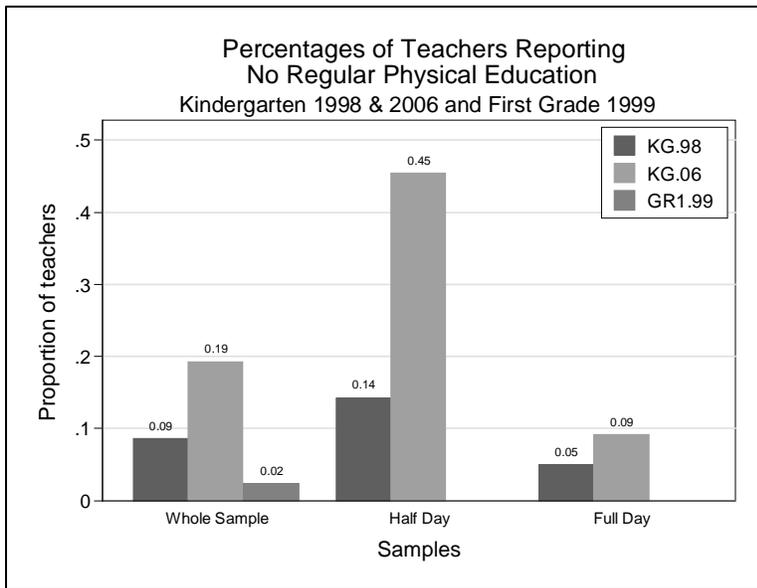


Table 1: Kindergarten teachers' beliefs about school readiness and kindergarten learning, 1998 and 2006

Readiness Beliefs (percentage indicating they agree or strongly agree)	<u>1998</u>	<u>2006</u>	<u>Difference</u>
<i>Most children should learn to read in kindergarten</i>	31	65	34***
<i>Parents should make sure their children know the alphabet before they start kindergarten</i>	29	52	22***
<i>Children who begin formal reading and math instruction in preschool will do better in elementary school</i>	34	55	21***
<i>Attending preschool is very important for success in kindergarten</i>	62	77	15***
How important do you believe the following characteristics are for a child to be ready for kindergarten? (percentage indicating skill is very important or essential)	<u>1998</u>	<u>2006</u>	<u>Difference</u>
Academic Skills			
<i>Knows most letters</i>	19	42	22***
<i>Identifies primary colors & shapes</i>	32	50	18***
<i>Can count to 20</i>	13	28	15***
Regulation			
<i>Can follow directions</i>	78	84	6***
<i>Sits still and pays attention</i>	60	66	6***
<i>Finishes tasks</i>	54	58	4**
<i>Is not disruptive</i>	78	80	2
Other Skills			
<i>Able to use pencil and paint brush</i>	36	60	24***
<i>Good problem-solving skills</i>	35	49	15***
<i>Takes turns and shares</i>	74	81	7***
<i>Communicates in primary language</i>	85	89	4***
<i>Sensitive to other children's feelings</i>	61	63	3
<i>Knows the English language</i>	50	51	1

Note: Samples limited to kindergarten teachers in public schools. All means are weighted at the teacher level, with appropriate sampling weights. Figures shown are percentages rounded to closest percentage point. Differences in means are designated as follows: *p<.05, ** p<.01 and *** p<.001.

Table 2: Kindergarten teachers' reported time use, 1998 and 2006

Curricular Focus	<u>All kindergarten teachers</u>			<u>Full Day</u>			<u>Half Day</u>		
	1998	2006	Difference	1998	2006	Difference	1998	2006	Difference
<i>Reading and language arts</i>	328	414	86***	362	456	94***	275	307	32***
<i>Mathematics</i>	200	198	-2	229	227	-2	156	125	-31***
<i>Social studies and science</i>	149	103	-46***	177	119	-58***	105	64	-41***
<i>Music and art</i>	139	112	-26***	154	121	-33***	115	89	-26***
Frequency/Intensity of physical education									
<i>Children in your class usually have physical ed. daily (1=yes)</i>	0.19	0.09	-0.1***	0.22	0.11	-0.11***	0.15	0.03	-0.12***
<i>Children in your class never have physical ed. (1=yes)</i>	0.09	0.19	0.11***	0.05	0.09	0.04***	0.14	0.45	0.31***
<i>Children spend more than 15 minutes in physical education in typical session (1=yes)^a</i>	0.85	0.44	-0.41***	0.93	0.50	-0.43***	0.71	0.18	-0.53***
Instructional Approach									
<i>In a typical day children spend an hour or more on child-selected activities (1=yes)</i>	0.56	0.33	-0.23***	0.71	0.43	-0.28***	0.32	0.08	0.25***
<i>In a typical day children spend three or more hours on teacher-directed whole class activities (1=yes)</i>	0.16	0.21	0.05***	0.22	0.29	0.06***	0.05	0.02	-0.03**

Note: Samples limited to kindergarten teachers in public schools. All means are weighted at the teacher level, with appropriate sampling weights. Differences in means are designated as follows: *p<.05, ** p<.01 and *** p<.001. ^aThese figures are conditioned on the teacher reporting that the child did have some exposure to PE (less than once a week or more). Teachers who reported that PE never occurred are excluded from this calculation. Percentages are rounded to closest percentage point.

Table 3: Kindergarten ELA Content Coverage, 1998 and 2006

Topic in ELA	Taught daily			Taught at least weekly			Never taught		
	1998	2006	Diff	1998	2006	Diff	1998	2006	Diff
<i>Matching letters to sounds</i>	84	91	7***	99	100	0	0	0	0***
<i>Conventions of print (left to right orientation, book holding)</i>	75	81	7***	95	98	2***	1	0	-1**
<i>Alphabet and letter recognition</i>	89	94	5***	99	100	1**	1	0	-1*
<i>Rhyming words and word families</i>	25	36	11***	87	96	8***	1	0	-1***
<i>Writing own name (first and last)</i>	81	89	9***	95	98	3***	2	0	-2***
<i>Making predictions based on text</i>	40	45	5**	92	96	5***	2	0	-1***
<i>Communicating complete ideas orally</i>	65	70	5***	95	97	2**	2	0	-1***
<i>Remembering and following directions that include a series of actions</i>	61	73	12***	93	97	4***	2	0	-1***
<i>Common prepositions such as over and under, up and down</i>	20	21	1	65	79	14***	8	1	-7***
<i>Identifying the main idea and parts of a story</i>	27	32	5***	73	90	17***	12	1	-11***
<i>Using context clues for comprehension</i>	34	40	6***	80	93	13***	12	1	-11***
<i>Vocabulary</i>	46	59	12***	74	92	17***	18	3	-16***
<i>Composing and writing complete sentences</i>	27	39	12***	61	90	28***	28	4	-24***
<i>Conventional spelling</i>	18	36	18***	44	75	32***	45	13	-32***
<i>Composing and writing stories with an understandable beginning, middle and end</i>	6	12	5***	24	46	22***	53	23	-30***

Note: Samples limited to kindergarten teachers in public schools. All means are weighted at the teacher level, with appropriate sampling weights. Differences in means are designated as follows: *p<.05, ** p<.01 and *** p<.001. Figures shown are percentages rounded to closest percentage point.

Table 4: Kindergarten Mathematics Content Coverage, 1998 and 2006,

Topic in Math	Taught daily			Taught at least weekly			Never taught		
	1998	2006	Diff	1998	2006	Diff	1998	2006	Diff
<i>Correspondence between number and quantity</i>	45	61	16***	94	98	4***	1	0	-1***
<i>Making, copying, or extending patterns</i>	25	33	8***	75	83	8***	1	0	-1***
<i>Writing all numbers between 1 and 10</i>	32	35	3	85	92	7***	2	0	-2***
<i>Identifying relative quantity (e.g., equal, most, less, more)</i>	23	28	5***	78	82	4***	2	0	-1***
<i>Ordering objects by size or other properties</i>	8	9	1	58	62	4**	2	0	-1***
<i>Sorting objects into subgroups according to a rule</i>	10	12	2*	63	72	8***	3	1	-2***
<i>Reading simple graphs</i>	19	29	10***	56	68	11***	3	2	-1*
<i>Ordinal numbers (e.g., first, second, third)</i>	24	28	5***	59	66	7***	3	2	-2***
<i>Recognizing and naming geometric shapes</i>	21	24	3*	69	74	5***	4	0	-3***
<i>Performing simple data collection and graphing</i>	10	21	11***	38	58	20***	7	2	-5***
<i>Adding single-digit numbers</i>	18	15	-4**	67	56	-11***	8	10	2
<i>Counting by 2s, 5s, and 10s</i>	30	38	9***	70	80	9***	10	4	-7***
<i>Recognizing the value of coins and currency</i>	14	19	5***	46	51	5***	10	8	-2*
<i>Reading two-digit numbers</i>	46	58	12***	79	85	6***	10	4	-6***
<i>Estimating quantities</i>	6	8	1	37	42	4**	10	7	-2*
<i>Telling time</i>	14	12	-2	43	40	-3*	17	12	-5***
<i>Subtracting single-digit numbers</i>	13	10	-3**	51	44	-7***	18	18	0
<i>Using measuring instruments accurately</i>	3	3	0	20	24	4**	19	13	-6***
<i>Counting beyond 100</i>	21	15	-5***	40	37	-2	36	28	-8***
<i>Fractions (e.g., recognizing that ¼ of a circle is colored)</i>	2	1	0	11	10	-1	43	37	-5**
<i>Writing all numbers between 1 and 100</i>	5	7	2*	20	26	6***	46	30	-16***
<i>Place value</i>	27	43	15***	40	57	17***	46	24	-21***
<i>Reading three-digit numbers</i>	19	12	-8***	33	26	-7***	51	41	-10***
<i>Writing math equations to solve word problems</i>	3	3	0	15	22	6***	60	38	-22***
<i>Estimating probability</i>	2	3	1	9	21	12***	61	28	-33***
<i>Mixed operations (e.g., 4+3-2=5)</i>	1	1	0	5	5	1	88	82	-6***

Note: Samples limited to kindergarten teachers in public schools. All means are weighted at the teacher level, with appropriate sampling weights. Differences in means are designated as follows: *p<.05, ** p<.01 and *** p<.001. Figures shown are percentages rounded to closest percentage point.

Table 5: Science and Social Studies Topics Covered, Kindergarten 1998 & 2006 and First Grade 1999

Topics in Science	K, 1998	K, 2006	Difference K06-K98	1st, 1999	Difference K06-1st 99
<i>Ecology</i>	77	34	-43***	76	-42***
<i>Dinosaurs and fossils</i>	67	32	-34***	59	-26***
<i>Sound</i>	65	31	-34***	59	-28***
<i>Light</i>	60	31	-29***	57	-26***
<i>Tools and their uses</i>	59	32	-27***	54	-22***
<i>Solar system and space</i>	60	36	-24***	60	-24***
<i>Machines and motors</i>	37	15	-22***	42	-27***
<i>Water</i>	78	59	-19***	77	-17***
<i>Magnetism and electricity</i>	55	37	-18***	54	-17***
<i>Scientific method</i>	52	40	-12***	67	-27***
<i>Understand and measure temperature</i>	67	57	-10***	86	-30***
<i>Health, safety, nutrition, and personal hygiene</i>	99	93	-6***	98	-5***
<i>Plants and animals</i>	99	95	-4***	96	-1
<i>Human body (e.g., senses, basic systems)</i>	86	85	-1	75	10***
<i>Weather(e.g., rainy, sunny)</i>	99	98	0	97	2**

Topics in Social Studies	1998	2006	Difference K06-K98	1st, 1999	Difference K06-1st 99
<i>Geography</i>	71	53	-18***	83	-30***
<i>Different cultures</i>	92	78	-14***	95	-18***
<i>Important figures and events in American history</i>	91	78	-13***	92	-14***
<i>Community resources (e.g., grocery store, police)</i>	96	85	-12***	90	-6***
<i>Map-reading skills</i>	65	55	-11***	94	-39***
<i>Reasons for rules, laws and government</i>	79	70	-9***	85	-15***
<i>Social-problem solving</i>	83	79	-4**	86	-7***

Note: Samples limited to teachers in public schools. Final columns refer to first grade teachers. All means are weighted at the teacher level, with appropriate sampling weights. Figures shown are percentages rounded to closest percentage point. Differences in means are designated as follows: *p<.05, ** p<.01 and *** p<.001.

Table 6: Teachers' beliefs about assessment practices, Kindergarten 1998 & 2006 and First Grade 1999

Panel A			
<u>Assessment Beliefs</u>	<u>K1998</u>	<u>K2006</u>	<u>Difference (K2006-K1998)</u>
<i>Individual child's achievement relative to local, state, or professional standards is very or extremely important</i>	57	76	19***
<i>Comparing Students</i>			
<i>I hold the same standards for most children, but I make exceptions for children with special needs</i>	57	57	0
<i>I hold different standards for different children based on what I think they are capable of</i>	26	16	-10***
<i>I hold the same standards for everyone in my class</i>	17	26	10***
Panel B			
How often do you use state or local standardized tests to assess your children?	<u>Kindergarten 2006</u>	<u>First Grade, 1999</u>	<u>Difference (K2006-Gr1_1999)</u>
<i>Never</i>	28	31	-3***
<i>Once or twice a year</i>	47	58	-11***
<i>Once or twice a month</i>	20	8	12***
<i>At least weekly</i>	5	3	3***

Note: Samples limited to teachers in public schools. Bottom panel compares kindergarten teachers in 2006 (ECLS-B) to first grade teachers in 1999 (ECLS-K). All means are weighted at the teacher level, with appropriate sampling weights. Figures shown are percentages rounded to closest percentage point. Differences in means are designated as follows: * $p < .05$, ** $p < .01$ and *** $p < .001$.

Table 7: Teachers’ beliefs, assessment practices and time use by school demographic composition measures, 1998 & 2006

Panel A	Teacher Beliefs						Assessment Practices			
	<u>Know alphabet before K</u>		<u>Most children should read in K</u>		<u>Formal reading/math in preschool</u>		<u>State/local standards</u>		<u>Same standards for all</u>	
	1998	2006	1998	2006	1998	2006	1998	2006	1998	2006
Top Quartile, % FRPL Eligible	0.41	0.61	0.44	0.72	0.53	0.69	0.67	0.81	0.24	0.32
Bottom 3 Quartiles, % FRPL Eligible	0.26	0.49	0.27	0.62	0.29	0.5	0.54	0.74	0.14	0.25
Difference	0.15	0.12	0.17	0.1	0.24	0.19	0.13	0.07	0.1	0.07
Top Quartile, % non-white	0.45	0.64	0.44	0.73	0.56	0.72	0.64	0.82	0.26	0.35
Bottom 3 Quartiles, % non-white	0.25	0.48	0.27	0.62	0.28	0.5	0.55	0.74	0.14	0.24
Difference	0.2	0.16	0.17	0.11	0.28	0.22	0.09	0.08	0.12	0.11
Panel B	Time Use (Minutes Per Week)									
	<u>Read/ELA</u>		<u>Math</u>		<u>Science/Social Studies</u>		<u>Art/Music</u>		<u>Daily PE (1=yes)</u>	
	1998	2006	1998	2006	1998	2006	1998	2006	1998	2006
Top Quartile, % FRPL Eligible	349	453	216	231	146	118	141	107	0.24	0.10
Bottom 3 Quartiles, % FRPL Eligible	326	403	195	189	152	98	136	114	0.19	0.09
Difference	23	50	21	42	-6	20	5	-7	0.05	0.013
Top Quartile, % non-white	351	455	211	242	149	124	136	107	0.26	0.12
Bottom 3 Quartiles, % non-white	322	403	197	186	148	97	140	113	0.18	0.08
Difference	29	52	14	56	1	27	-4	-6	0.08	0.04

Note: Samples limited to teachers in public schools. “Difference” represents the difference between the two demographic groups within a particular year. All means are weighted at the teacher level, with appropriate sampling weights. Figures shown are percentages rounded to closest percentage point.

Table 8: OLS Models predicting changes in teachers' beliefs, assessment practices and time use 1998-2006, by school demographic composition measures,

	School Readiness			Time Use (minutes per week)			Assessment			
	Know alphabet before K	Most children should read in K	Formal reading /math in preschool	Read/ELA	Math	Science/ Social Studies	Art/Music	PE Daily	State/local standards	Same standards for all
Differential Changes by Percentage Eligible for FRPL										
2006	0.25*** (0.02)	0.35*** (0.02)	0.23*** (0.02)	64.78*** (5.65)	-10.57* (4.54)	-56.02*** (4.77)	-25.79*** (4.08)	-0.09*** (0.01)	0.21*** (0.02)	0.11*** (0.02)
High FRPL eligibility	0.06+ (0.03)	0.09** (0.03)	0.13*** (0.03)	-0.29 (9.69)	-11.10 (7.88)	-25.69** (8.83)	6.99 (7.12)	0.01 (0.03)	0.09** (0.03)	0.03 (0.03)
High FRPL X 2006	-0.05 (0.04)	-0.06+ (0.04)	-0.04 (0.04)	18.25+ (10.81)	10.32 (8.75)	19.34* (9.41)	-12.04 (7.62)	-0.05+ (0.03)	-0.05 (0.03)	-0.02 (0.03)
Constant	0.33*** (0.05)	0.19*** (0.04)	0.30*** (0.05)	208.74*** (13.30)	147.76*** (11.48)	139.12*** (9.04)	118.00*** (8.49)	0.30*** (0.03)	0.55*** (0.04)	0.18*** (0.04)
Differential Changes by Percentage Non-White										
2006	0.25*** (0.02)	0.35*** (0.02)	0.23*** (0.02)	64.11*** (5.60)	-15.49*** (4.48)	-56.47*** (4.70)	-27.54*** (4.14)	-0.09*** (0.01)	0.19*** (0.02)	0.11*** (0.02)
High Non-White	0.18*** (0.03)	0.12*** (0.03)	0.22*** (0.03)	-14.29 (10.39)	3.68 (8.60)	0.85 (9.38)	-2.86 (7.58)	0.12*** (0.03)	0.03 (0.03)	0.06+ (0.03)
Hi Non-White X 2006	-0.05 (0.04)	-0.06 (0.04)	-0.06+ (0.04)	22.46* (10.89)	32.88*** (8.94)	22.52* (9.67)	-4.96 (7.06)	-0.05+ (0.03)	-0.00 (0.03)	-0.00 (0.03)
Constant	0.33*** (0.05)	0.19*** (0.04)	0.30*** (0.05)	209.22*** (13.21)	152.16*** (11.43)	139.41*** (9.10)	119.66*** (8.47)	0.30*** (0.03)	0.56*** (0.04)	0.18*** (0.04)

Models include all public school kindergartens teachers. Models include controls for school size, full-day status, urbanicity, region, access to preschool, and teachers' experience level. Sample sizes are between 5900 and 6400, rounded as per NCEs requirements. * p<.05, ** p<.01, and *** p<.001