

PRACTICES MATTER

Major Findings from the Charlotte-Mecklenburg Schools (CMS) Teacher Literacy Survey

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A Note to the Reader

We have written this report to be read at three levels. At the first level, you can get the gist of the key findings by reading the executive summary, the introduction, the section summaries (highlighted in the green boxes), and the conclusion. At the second level, you can dive deeply into the main text of each section of the report to learn more about the results of the analyses. Finally, at the third level, the appendices expand on the technical details and research methods.

Acknowledgments

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Executive Summary

As a district, Charlotte-Mecklenburg Schools (CMS) has made major progress over the last decade. In 2011, CMS educators earned national praise for winning the Broad Prize for Urban Education, having accelerated student achievement gains and closed performance gaps based on student background. In the 2015 National Assessment of Educational Progress, CMS fourth-graders scored significantly higher than their peers in other large, urban districts. Currently, the district is working towards a new vision of ambitious instruction outlined by the Common Core State Standards (CCSS) in English Language Arts (ELA). Additionally, in partnership with Read Charlotte, CMS leaders have embraced the ambitious goal of doubling the percentage of children reading proficiently from 40% to 80% by 2025.

Literacy Challenge

Like most urban districts in the United States, CMS faces a number of literacy challenges, including the challenge of improving students' performance on standardized measures across the school years and summers from Kindergarten to Grade 3. Trends in data from the 2016-17 school year suggest that student achievement grows quickly in the fall but slows in the spring. Additionally, there is increasing variability in student literacy performance over time, particularly after summer vacation on beginning-of-year assessments. These descriptive trends are consistent with national data indicating that variability in student literacy achievement increases more in the summer months, as children experience more "separate" and unequal summers (Entwisle, Alexander, & Olson, 2000).

CMS Teacher Survey

With the ultimate goal of building a more cohesive and tailored K-5 literacy strategy for CMS, district leaders commissioned this report to better understand whether and how teachers' ELA practices in CMS are related to student achievement on (a) the Measure of Academic Progress in reading (MAP), a computer-adaptive measure of reading comprehension, (b) the MCLASS, which measures foundational word reading skills, fluency, and basic comprehension, and (c) the North Carolina End of Grade 3 (EOG) reading comprehension test. From May to June of 2017, we (researchers at the Harvard Graduate School of Education) surveyed a representative sample of 900 Kindergarten to Grade 5 Teachers in 30 K-5 CMS schools. This report focuses on K-3 teachers in the survey schools.

The 30 schools were randomly selected from each of the ten Learning Communities to ensure that the findings generalize to the entire population of K-5 CMS schools. The response rate of 87% underscores the remarkable commitment of CMS teachers to share their valuable perspectives about their classroom ELA practices. In sum, the school sample and the high teacher response rate enable us to paint a clear picture of teachers' ELA practices and their relation to end-of-year student literacy outcomes and to make generalizations to the entire population of CMS K-5 schools. While, because of the research design, we cannot say that particular ELA practices *caused* differences in student performance, we are able to infer that relationships and correlations between practices and outcomes hold across the entire school district.

Our survey was designed to address the following questions:

1. How are K-3 classroom teachers implementing the Common Core State Standards in ELA? In particular, what do teachers tell us about the level of institutional support for the Common Core and the types of resources and assessments used in ELA?
2. In Kindergarten to Grade 2, what is the association between teachers' foundational ELA practices and student literacy outcomes after we account for differences in student background characteristics and the instructional context? Does the association between K-2 teachers' foundational ELA practices and student literacy outcomes depend on the school context?
3. In Grade 3, what is the association between teachers' Common Core-aligned ELA practices and student literacy outcomes after we account for differences in student background characteristics and the instructional context? Does the association between Grade 3 teachers' Common Core-aligned ELA practices and student literacy outcomes depend on the school context?

In this report, we highlight both findings and potential “high-leverage” principles that are grounded in the research literature. These findings can be used to inform next steps in CMS’s literacy strategy.

Here, we highlight five major findings:

1. **We identified two high-leverage K-2 ELA practices that predicted student literacy achievement in the early grades.** In Grade 1, teachers' foundational ELA practices in phonemic awareness predicted end-of-year student MAP outcomes. In Grade 2 teachers' foundational ELA practices in phonics predicted end-of-year MAP outcomes. The key implication here is that the effects of foundational ELA practices appear to depend on students' stage of reading development. More time on foundational practices like phonics and phonemic awareness appears to benefit students more in Grades 1 and 2 than in the later grades. This finding is discussed in more depth in Section III.
2. **In Title I schools, while code-focused instruction is positively associated with student performance on tests that assess code-focused skills, it is negatively associated with performance on tests that assess meaning-focused skills.** In Title I schools, code-focused instruction such as phonics is positively associated with student performance on tests that assess more code-focused skills, such as the MCLASS. However, there is a negative association between phonics instruction and student performance on tests that do not emphasize code-focused skills and instead assess students' knowledge of vocabulary and content knowledge. The key implication here is that integrating code and meaning-focused instruction in the context

of the same literacy activity is critical to simultaneously improving procedural word reading skills and the ability to read for understanding. This finding is discussed in more depth in Section III.

3. **The relationship between writing instruction and student literacy achievement is particularly sensitive to teachers' school professional contexts.** Writing instruction is an important ELA practice that rarely occurs in US elementary schools—particularly higher-poverty, Title I schools (Connor et al., 2013). In schools with stronger professional communities, writing practices are positively related to student literacy achievement. The effects of teachers' foundational writing practices—for example, teaching students to compose and write complete sentences, write stories with an understandable beginning, middle, and end, and to use conventional spelling strategies—predict stronger Kindergarten performance when teachers perceive that their professional community is strong. In strong professional communities, teachers tend to report high levels of trust among colleagues, feel safe to discuss feelings, worries, and frustrations with other teachers, respect other teachers who take the lead in school improvement efforts, and feel respected by their colleagues. This finding is discussed in more depth in Section III.
4. **For children in higher poverty, Title I schools, we find evidence that academic language instruction, writing, and fluency are positively associated with third-grade reading outcomes.** Academic language instruction and writing are practices that rarely occur in many US public schools, particularly high-poverty schools (Foorman et al., 2016). Yet, they appear to be high-leverage Common Core-aligned practices that are particularly important in third-grade. Furthermore, children's ability to read text with fluency—speed, accuracy, and oral expressiveness—can serve as the theoretical bridge between decoding and comprehension. Together, the integration of meaning-focused practices that rarely occur in high-poverty schools and code-focused fluency practices seem most beneficial in Title I schools. This finding is discussed in more depth in Section IV.
5. **The most consistent finding in this report is that Grade 3 teachers' Common Core-aligned writing practices have stronger effects on student literacy outcomes in schools with stronger professional communities.** Findings that replicate across different tests merit greater confidence than those that are simply observed on a single test. We find consistent evidence that Common Core-aligned writing instruction predicts student literacy achievement - but this relationship is strongest in schools where teachers perceive that there is a strong professional community. In some respects, this finding underscores the importance of enhancing the coherence of school Instructional Leadership Teams as CMS teachers aim to teach students how to write with evidence in response to complex informational text. This finding is discussed in more depth in Section IV.

Introduction

The Charlotte-Mecklenburg Schools (CMS)

In 2011, CMS educators earned national praise for winning the Broad Prize for Urban Education, having accelerated student achievement gains and closed performance gaps based on student background. To celebrate this accomplishment, then U.S. Secretary of Education Arne Duncan noted that, “Charlotte-Mecklenburg is a model for innovation in urban education. It has taken on the tough work of turning around low-performing schools, created a culture of using data to improve classroom instruction, and put a laser-like focus on preparing students for college and careers.”¹ Indeed, on the 2015 National Assessment of Educational Progress, CMS fourth-graders scored significantly higher than their peers in other large, urban districts, underscoring the district’s status as an innovative and high-performing system.²

In June of 2010, North Carolina’s state board of education voted to adopt the Common Core State Standards (CCSS). Since then, their adoption and implementation has been the subject of vigorous and contentious debate both within North Carolina and across the nation. While many states that initially supported the CCSS have since abandoned them, North Carolina has kept them in place while simultaneously reviewing them. As a district, Charlotte-Mecklenburg Schools (CMS) has maintained support for CCSS, including guides for parents on what skills and content the Standards cover. Five years have passed since the CCSS were implemented in North Carolina schools. Beyond the political rhetoric, how do teachers, charged with instructing young students in literacy and comprehension, view these Standards? Do they view this as a top-down mandate or have they fully embraced it themselves? CCSS represent neither a curriculum nor a set of curricular materials. In light of this, from which sources are teachers drawing their ELA curricular materials, and what practice assessments are they using to track their students’ performance?

In 2015, at the same time that CMS leaders celebrated their district’s success, they were planning for the future. In particular, CMS leaders recognized the challenge of ensuring that the whole system--all schools and classrooms--enacted a new vision of ambitious instruction outlined by the Common Core State Standards (CCSS) in English Language Arts and continued to close performance gaps based on students’ family income, ethnicity, English language proficiency, and special education status. At the same time, in partnership with Read Charlotte, led by Executive Director Munro Richardson, CMS leaders embraced the ambitious goal of doubling the percentage of children reading proficiently from 40% to 80% by 2025.

The magnitude of the CMS literacy challenge can be summed up by the descriptive trends in student performance on MCLASS and MAP across the school years and summers from Kindergarten to Grade 3.

¹<http://www.cms.k12.nc.us/News/Pages/2011BroadPrizeAwardedtoCharlotte-MecklenburgSchools.aspx>

²https://www.nationsreportcard.gov/reading_math_2015/#reading/district/comparisons/XT?grade=4

From Kindergarten to Grade 2, student achievement grows quickly in the fall but slows in the spring (Figures A.1. and A.2.).

- For example, students in Grade 1 enjoy an average gain of 72 points on the MCLASS but exhibit essentially no growth in the spring.
- Although not as striking on the MAP, there is a similar and consistent trend across grades, suggesting that literacy growth from Kindergarten to Grade 2 is much faster in the beginning of the year compared to the end. Figures 1.1 and 1.2 display the mean score on the MCLASS and MAP tests at the beginning, middle, and end-of-year.
- Performance gaps between individual students widen over time, particularly after summer vacation on beginning of year assessments (Figures A.3. and A.4.). On the MCLASS, the variability in student performance, as measured by the standard deviation in test scores, increases from the beginning of Kindergarten to the end of Grade 2. In other words, we found increasing gaps in student literacy performance over the school year and summer, particularly from the end-of-year Grade 2 to the beginning-of-year Grade 3 assessments.
- The increasing variability in reading scores is less apparent on MAP compared to MCLASS. Following the summers after K, the variability in MAP scores increases from SD = 14.69 to SD = 15.63. in the summers after Grade 1 and Grade 2, there is also a small increase in the standard deviation in reading scores.

Figure A.1 and A.2. Average MCLASS and MAP Performance in the Beginning, Middle, and End-of-Year for Students in Kindergarten, Grade 1, Grade 2, and Grade 3 in 2016-17

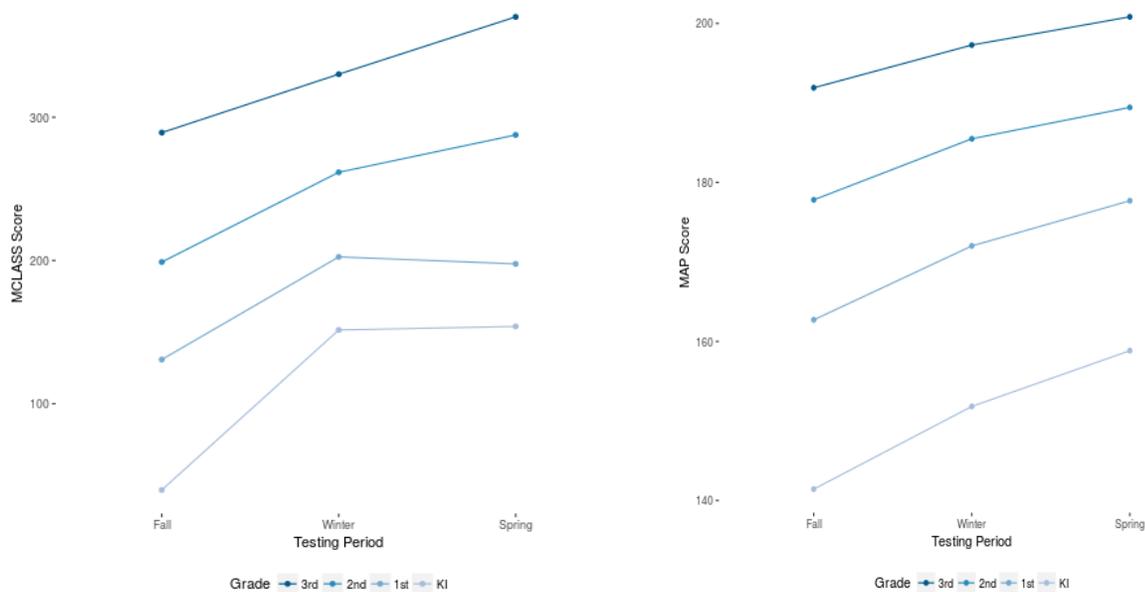


Figure A.3. Variability (Standard Deviation) in MCLASS Performance in the Beginning, Middle, and End-of-Year for Students in Kindergarten, Grade 1, Grade 2, and Grade 3 in 2016-17

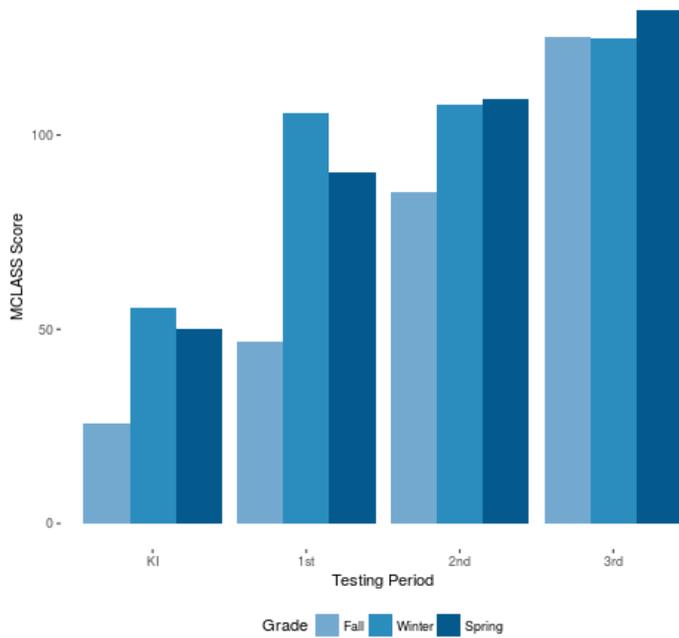
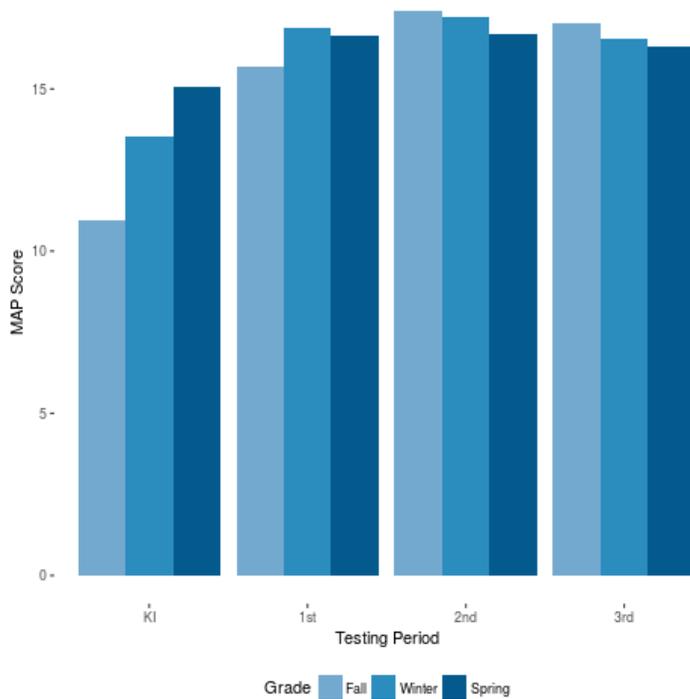


Figure A.4. Variability (Standard Deviation) in MAP Performance in the Beginning, Middle, and End-of-Year for Students in Kindergarten, Grade 1, Grade 2, and Grade 3 in 2016-17



A Strategy for Addressing 21st Century Literacy Challenges

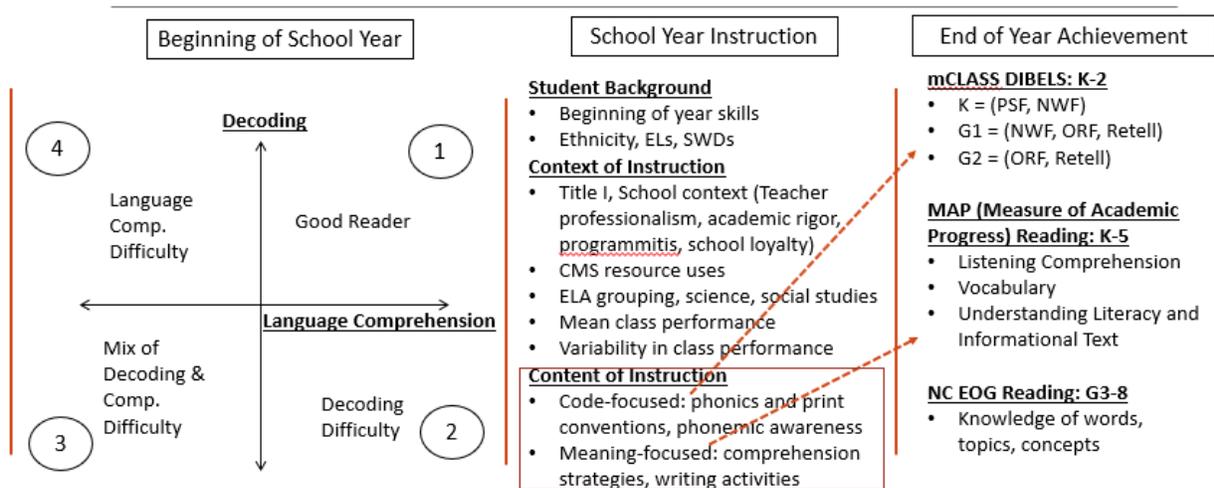
To inform evidence-based decisions in literacy designed to achieve their ambitious vision of instruction, CMS leaders and Read Charlotte recognized the need for data on teachers' ELA practices, which practices predict student literacy outcomes, and the conditions under which these practices are most effective. They commissioned a study to better understand whether and how CMS teachers' ELA practices were related to their students' achievement. This report presents findings from that study. Fundamentally, it aims to identify potential high-leverage principles and practices that predict student literacy achievement, as well as supportive contextual factors.

From May to June of 2017, researchers at the [READS Lab](#) at the Harvard Graduate School of Education surveyed 900 Kindergarten to Grade 5 Teachers in 30 K-5 CMS schools. These 30 schools were randomly selected from each of the ten Learning Communities to ensure that the findings generalize to the entire population of K-5 CMS schools. The response of 87% (900 of 1,038 teachers completed the survey) underscores the remarkable commitment of CMS teachers to share their valuable perspectives about their classroom ELA practices. We surveyed teachers about the amount of time they spent (a) grouping students for ELA instruction, (b) teaching phonics, phonological awareness, fluency, basic comprehension, and basic writing, and (c) implementing Common Core-aligned ELA practices focused on understanding key ideas and details, the integration of ideas within text, academic language, as well as foundational practices in word reading, fluency, and writing. The representative school sample and high teacher response rate on this survey enabled us to paint a clear picture of teachers' ELA practices and their relation to end-of-year student literacy outcomes.

In Figure A.5, we highlight our approach for isolating high-leverage practices that foster student success on end-of-year literacy assessments. Essentially, we linked survey data on teachers' reported ELA practices (i.e., the "content of instruction," including both code and meaning-focused instruction) to their students' literacy achievement, as described in the far right panel. By doing so, we have the unique ability to isolate high-leverage ELA practices that predict end-of-year student literacy outcomes, controlling for a host of student background and instructional context factors that may be related to student performance. Details on each of the four components of practice, and the specific survey items that were administered to teachers, can be found in Table 1.1. For additional information on how these components of practice were derived from the individual survey items, please see Appendix B.

To isolate the relationship between teachers' ELA practices and their students' outcomes, we controlled for initial differences in student achievement at the beginning of the school year. If we did not control for students' initial achievement, we might mistakenly attribute high test scores at the end of the year to classroom practices, when in reality those students had been advanced at the beginning of the year. We also controlled for student demographic characteristics and the context of instruction (i.e., time spent on science and social studies, the extent to which teachers used balanced literacy resources provided by the district, and the average performance level and variability in skills among students in the classroom).

Figure A.5. How the Context and Content of Instruction Predict Student Achievement



In this report, we use the term **K-2 teachers’ foundational ELA practices** and **Grade 3 teachers’ Common Core-aligned ELA practices** to describe teachers’ self-reported classroom practices during the traditional 2-hour literacy block. See Table 1.2 in Section I for the specific practices that were either code-focused or meaning-focused. We use the term **student literacy outcomes and student achievement** to refer to end-of-year performance on one of three measures: (a) the Measure of Academic Progress in reading (MAP), a computer-adaptive measure of reading comprehension, (b) the MCLASS, which measures foundational word reading skills, fluency, and basic comprehension, and (c) the North Carolina End of Grade 3 (EOG) Reading comprehension test. We use the term **code-focused instruction** to refer to instruction that is explicitly designed to help children make explicit connections between letters and sounds, to decode words, and to read connected text with accuracy, speed, and understanding (Gough & Tunmer, 1986). We use the term **meaning-focused instruction** to refer to instruction that helps children extract and construct meaning through interaction with written language (RAND Reading Research Group, 2002).

Understanding What This Report Can and Cannot Say

A fundamental principle of research is that **research design matters**. In other words, to make clear causal inferences about any educational policy or practice, it is critical to have an experimental design that randomly assigns schools, teachers, or students to different conditions. A survey study, such as this one, is not an experimental design. Instead we statistically control for (i.e., “hold constant”) variables that are often correlated with teacher practices and student achievement. By controlling for factors beyond a teacher’s influence (e.g., the beginning of year skills of their students) as well as the resources teachers use to plan instruction (e.g., the CMS balanced literacy resources), we can isolate high-leverage practices that predict student outcomes and illuminate whether such practices are helpful for certain subgroups of students and schools. For details on issues of validity in survey research, see Appendix C.

Report Overview

The remainder of the report is organized into 6 sections. In **Section 1**, we provide details on the study design including the methods for sampling schools and teachers. **Section 2** describes how teachers perceive their colleagues' (other teachers, principals, district leaders) support for the CCSS and the kinds of resources and assessments used to enact the CCSS. **Section 3** highlights K-2 teachers' ELA practices that are associated with student literacy outcomes across grades and on different outcome measures and whether these associations depend on school contexts. **Section 4** casts a bright light on third-grade, examining whether and to what extent the association between Grade 3 teachers' Common Core-aligned ELA practices and student literacy outcomes depend on characteristics of students and schools. **Section 5** highlights findings from early stages of this project when we surveyed literacy facilitators across all CMS schools to illustrate the overall level and variation in the use of core CMS literacy resources. **Section 6** concludes this report by offering potential high-leverage principles and practices for tackling the 21st century literacy challenges faced by CMS and other large urban districts. A survey can help to paint a clear picture of the broader landscape of ELA practices across an entire system. We hope this study is a model for other districts seeking to foster literacy improvement at scale.

Section I: Study Design

Section summary: We designed this study to support CMS’s goal of delivering ambitious literacy instruction to all students. We administered surveys during May and June 2017 and obtained a response rate of 87% (900 of 1,038 teachers sampled).

- **Who participated?** We surveyed a representative sample of 1,038 K-5 teachers from 30 randomly-selected CMS elementary schools.
- **What measures were used?** To answer our research questions, we used standardized measures of student literacy outcomes. We also used survey data to create indices of ELA practices, as well as indices of school context.
- **How were the data analyzed?** We conducted two sets of analyses. To address our first set of research questions, we present descriptive findings of individual teachers and how they reported experiencing Common Core implementation at their school. To address our second and third research questions, we present associations between the practices of individual teachers and the performance of the students in their classroom.

We designed this study to support CMS’s goal of delivering ambitious literacy instruction to all students. We administered surveys during May and June 2017 and obtained a response rate of 87%. By collecting information from teachers at the end of the school year, our goal was to capture and describe teacher practices from throughout the school year. In addition, we linked teachers’ survey responses to their students’ end-of-year literacy achievement. Our aim was to be able to identify potential high-leverage ELA practices that predict student literacy achievement, as well as the contextual factors that support these practices. Specifically, our study addresses the following three research questions:

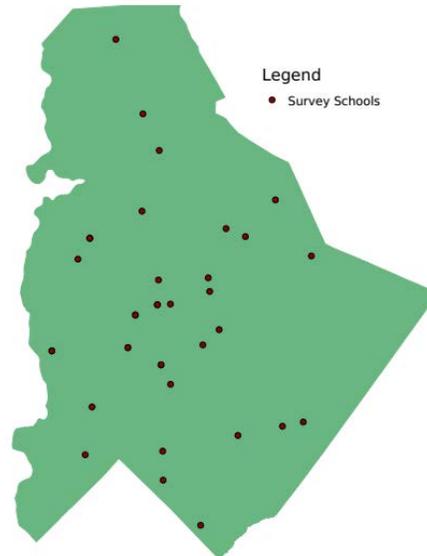
1. How are K-3 classroom teachers implementing the Common Core State Standards in ELA? In particular, what do teachers tell us about the level of institutional support for the Common Core and the types of resources and assessments used in ELA?
2. In Kindergarten to Grade 2, what is the association between teachers’ foundational ELA practices and student literacy outcomes after we account for differences in student background characteristics and the instructional context? Does the association between K-2 teachers’ foundational ELA practices and student literacy outcomes vary by the initial performance of students or the school context?
3. In Grade 3, what is the association between teachers’ Common Core-aligned ELA practices and student literacy outcomes after we account for differences in student background characteristics and the instructional context? Does the association between Grade 3 teachers’ Common Core-aligned ELA practices and student literacy outcomes vary by the initial performance of students or the school context?

Who participated in this survey study?

We surveyed a representative sample of 1,038 K-5 teachers from 30 randomly-selected CMS elementary schools and 900 teachers ultimately completed the survey. To ensure a representative sample of classrooms were included in the study, we used a stratified random sampling design to select

participating elementary schools in Charlotte-Mecklenburg. Schools were grouped according to their local administrative units called “Learning Communities,” each of which is led by a Learning Community superintendent. Depending on the number of schools in the Learning Community, between two and five schools from each Community were randomly selected to participate in the study. This stratification meant that our sample was guaranteed to include schools from across the district. This is shown in Figure 1.1, which maps the location of study schools across the district.

Figure 1.1. Location of the 30 CMS Survey Schools



The randomization process for selecting schools within each Learning Community ensured that the sampled schools were, on average, similar to, and representative of, the rest of the elementary schools in the district. Table 1.1 shows that our surveyed schools were similar to other CMS schools with regards to student demographics and student academic performance.

Table 1.1. Comparison of Student Demographic Characteristics of Survey Schools and Non-Survey Schools

| | Survey Schools | Non-Survey Schools | P-Value of Difference |
|--------------------------|----------------|--------------------|-----------------------|
| Race | | | |
| White | 27.4 | 28.8 | 0.816 |
| Black | 42.8 | 40.2 | 0.619 |
| Hispanic | 22.4 | 22.4 | 0.990 |
| Asian | 4.9 | 6.0 | 0.284 |
| Other | 2.1 | 2.0 | 0.575 |
| Poverty (% of Students) | | | |
| Free lunch | 64.4 | 63.4 | 0.901 |
| Free/reduced-price lunch | 66.5 | 65.4 | 0.890 |

| | | | |
|---|------|------|-------|
| Low Performing (%) | 10.0 | 11.5 | 0.822 |
| <p>Note: Demographic statistics derived from CCD data, which is missing for 4 schools in the non-survey sample. Student-level poverty measures are no longer collected by CMS and are NCES extrapolations from the last year of data collection. Low Performing status was designated by NC Department of Public Instruction.</p> | | | |

What measures were used in this survey study?

To answer our research questions, we used standardized measures of student literacy outcomes. We also used survey data to create indices of ELA practices, as well as indices of school context.

Student literacy outcomes were measured using three distinct assessments, the MCLASS Composite Score, the MAP RIT Scale Score, and the EOG Scale Score, hereafter referred to as MCLASS, MAP, and EOG scores. All three of these assessments require students to demonstrate both code- and meaning-focused competences, but different tests emphasize one over the other. For example, the MCLASS has a stronger emphasis on code-related skills since students must orally read from a grade-level passage, demonstrate adequate accuracy and speed in reading aloud, and be able to answer simple comprehension tasks. On the other hand, the MAP and EOG emphasize meaning-focused competencies since both tests require students to independently and silently read narrative and expository passages and then answer literal and inferential questions. The MCLASS and MAP are administered three times a year and have wide coverage across the district, especially in the younger grades (K-3). The EOG is administered at the end of the year for students in third grade and higher.

The content of the survey was informed by existing measures that address the constructs of interest: implementation of Common Core Standards, instructional practices for English Language Arts instruction, and measures of school climate. The survey also included replications of specific items from Teaching Higher, a study of Common Core Implementation in five U.S. states (Kane et al., 2016); the Early Childhood Longitudinal Surveys, Kindergarten Cohort of 1999, and Kindergarten Cohort of 2010; and the University of Chicago Consortium’s Five Essentials Survey (Bryk et al., 2010). Throughout this study, the key predictors of interest are measures of ELA instruction and measures of school context.

ELA instructional practices are measured with specific indices representing the frequency with which certain types of instruction are provided. The indices are grouped into two categories: four foundational ELA Practices and five Common Core-Aligned Practices. Table 1.2 provides a short description of each type of practice. More information about the development of these indices, including the component survey items, can be found in Appendix B.

Table 1.2. Indices of ELA Instructional Practices

| Categories of Instructional Practice | | Indices of Instructional Practices (Skills) |
|--|---------------------------|---|
| K-2 Foundational ELA Practices | Code-focused practices | Phonics and print conventions |
| | | Phonemic awareness |
| | Meaning-focused practices | Comprehension strategies |
| | | Writing activities |
| Grade 3 Common Core-Aligned ELA Practices | Code-focused practices | Phonics and phonological awareness |
| | | Fluency |
| | Meaning-focused practices | Writing activities |
| | | Comprehension strategies |
| | | Academic language instruction |

The actual values of the practice indices represent a weighted average of the frequency with which each survey item was performed over the course of the school year. Thus, a value of 0 would indicate a teacher who spent no time on these practices, whereas a value of 1 would indicate a teacher who used these practices every day.

School context measures are described in Table 1.3 and include: perceived teacher community, perceived school rigor, perceived programitis, and school loyalty. It is important to note that these measures are asking teachers to report on what they believe is true about their school. While we find that teachers in the same school tend to share similar views on these areas, there is still substantial variation in the way teachers in the same school perceive these measures. Additional information about both sets of indices can be found in Appendix B.

Table 1.3 Indices of School Context

| Index | Description |
|-----------------------------|---|
| Perceived Teacher Community | Belief that teachers collaborate and support each other |

| | |
|------------------------|---|
| Perceived School Rigor | Perception of school’s curriculum and student expectations to be academically challenging |
| Perceived Programmitis | Perception that many different programs and initiatives come and go at the school |
| School Loyalty | Sense of personal loyalty and commitment to school |

How were the data analyzed?

We conducted two sets of analyses. To address our first set of research questions (i.e., How are K-3 classroom teachers implementing the Common Core State Standards in ELA? In particular, what do teachers tell us about the level of institutional support for the Common Core and the types of resources and assessments used in ELA?), we present descriptive findings of individual teachers and how they reported experiencing Common Core implementation at their school. To address our second and third research questions, we present associations between the practices of individual teachers and the performance of the students in their classroom.

For all analyses, the sample is limited to teachers who were listed as the primary ELA teacher for a classroom. For analyses using student achievement as the outcome, only students whose teachers responded to the survey were included in the sample. In analyses of student performance, we sought to control for a wide range of factors that might confound the relationship between instructional practices and student performance. These factors include student characteristics like prior academic performance, classroom features associated with individual teachers like time spent on other subjects, and school features like Title-I status. Details on the model specification can be found in Appendix B.

Section II: How Are Teachers Enacting the Common Core State Standards in English Language Arts?

Section summary:

- Despite controversies surrounding the CCSS, CMS teachers perceived high levels of support for the CCSS, both in their buildings and the district.
- CCSS implementation, however, has been far more mixed. Teachers reported using a wide variety of resources and assessments as part of their daily instruction.
- Teachers reported most frequently using within-school and district resources. In general, teachers seemed more likely to turn to district-developed materials before looking to the state level, and more likely to look at their own state's resources before looking elsewhere. The most commonly used assessment materials were formative assessments created by teachers and schools.
- We identified 4 profiles of teacher-resource use in our sample--heavy users, light users, users of established materials, and users of heterogeneous 'other' materials. Further details on each profile is provided later in the section.
- The typical K-2 teacher reported teaching foundational writing practices on 80% of school days and teaching phonics on 25% of school days. However, teachers varied widely in how often they reported teaching particular foundational ELA practices.
- The typical Grade 3 teacher reported teaching Common Core-aligned writing practices on less than 20% of school days. She taught academic vocabulary knowledge on 60% of school days. As in K-2 classrooms, Grade 3 teachers varied widely in how often they reported teaching particular ELA practices.
- Looking more deeply into time spent on both foundational and Common Core-aligned ELA practices, we see wide variation across teachers. This variation allows us, in Section 3, to look at which of these practices are associated with higher growth on assessments of student literacy and ELA mastery.

In this section, we report survey results from questions we asked teachers about their attitudes and practices surrounding the adoption and implementation CCSS. Given the contentious nature of the CCSS, especially within North Carolina, we asked teachers in CMS about the degree to which they felt that fellow teachers, principals, and administrators had embraced the Standards. We also asked teachers to report how often they used instructional resources from various sources such as the district or commercial vendors. Finally, given the high-stakes testing that has accompanied the implementation of CCSS, we asked teachers how often they used various types of assessments with their students. Beyond simply reporting district averages for each of these questions, we examine whether teachers' answers differ by the school or grade in which they teach. Of particular interest is whether school-level characteristics, like average poverty level or student racial composition, are associated with teachers' attitudes and practices toward the CCSS. Specifically, we answer the following research questions:

- How are K-3 classroom teachers implementing the Common Core State Standards in ELA?

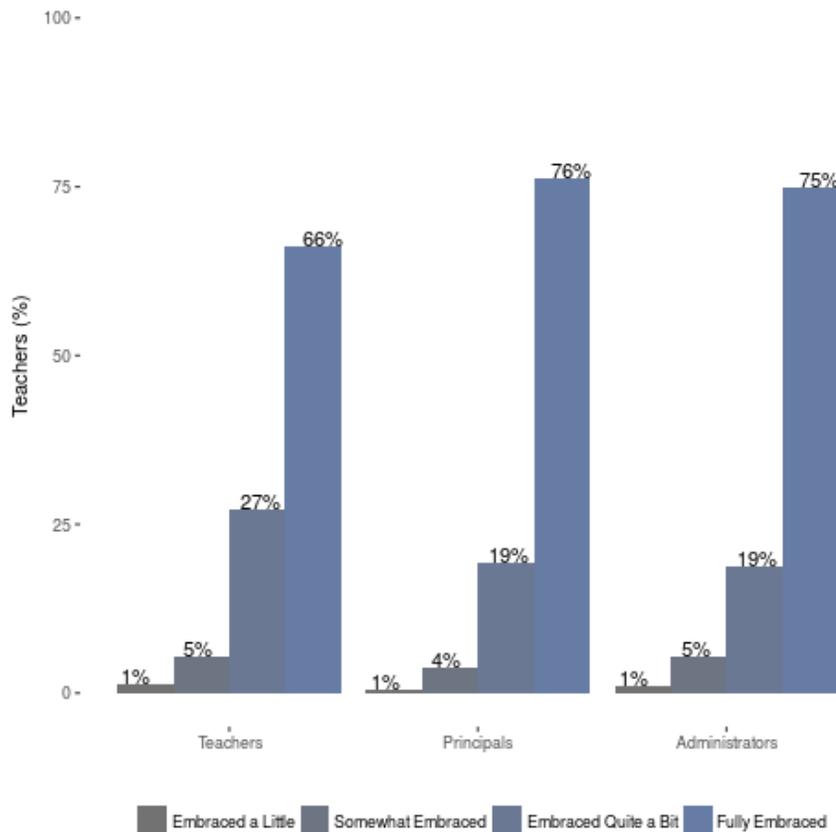
- In particular, what do teachers tell us about the level of institutional support for the Common Core and the types of resources and assessments used in ELA?

Finding: Overall, teachers perceive high levels of support for the CCSS, both in their buildings and in the district.

In order to assess teachers’ acceptance of the CCSS, we asked them to report on whether they felt that their fellow teachers, principal, and district administrators had embraced the CCSS. By asking teachers to share their impression of peers and superiors, rather than asking directly about their own attitudes, we hoped to avoid having teachers simply mark the response that they thought was ‘correct’.

Figure 2.1 shows the results of our survey, which indicate that teachers believe that over 90% of the teachers in their schools have either ‘Embraced Quite a Bit’ or ‘Fully Embraced’ the CCSS. Moreover, teachers believe that principals in their schools as well as CMS district administrators have embraced the CCSS to a similar degree. We do see higher percentages of principals and administrators in the ‘Fully Embraced’ category, potentially indicating perceptions that school and district leaders are the ones leading this reform, rather than it being a teacher-led movement.

Figure 2.1. Teacher Survey Item: To what extent would you say that the following individuals have embraced the CCSS?



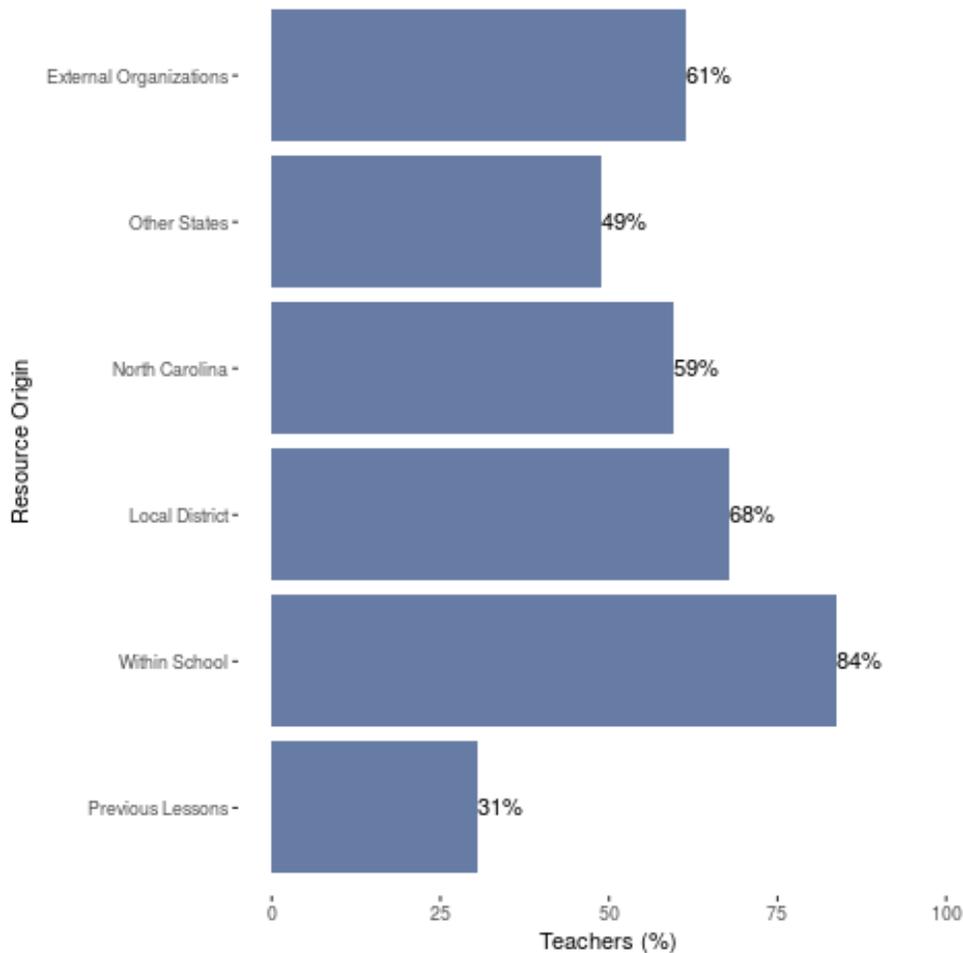
In seeing such high endorsement of the CCSS, one might ask, “How does this vary across schools or by teachers’ grade-level?” Although not shown here, we explored these questions. In our analysis, we found that there was virtually no variation across grade levels in teachers’ perception of CCSS adoption, and while there was slight variation across schools, it was not large enough to be meaningful.

Finding: Teachers reported drawing on a variety of resources to support their ELA instruction. Most frequently, they used within-school and district resources. In general, teachers seem more likely to turn to district-developed materials before looking to the state level, and are more likely to look at their own state’s resources before looking elsewhere.

To facilitate teachers’ implementation of the Standards, CMS has provided significant guidance in the form of Scope & Sequence documents that lay out a curricular plan for teachers across subject and grade levels. However, these were not accompanied by mandatory lesson plans or textbooks. As a result, it was ultimately left to schools and teachers to find resources aligned to the new Standards. Many surveyed teachers used self-designated resources (e.g., resources they found on their own), either alone or in conjunction with other teachers in their school. Other teachers turned to district or state provided resources. Still other schools purchased curricular resources from external organizations, either commercial vendors or non-profits, for their teachers to use (e.g., resources from Engage New York).

Figure 2.2 shows which curricular resources teachers reported using on at least a weekly basis. By far, the most commonly used resources were developed within schools either by teachers individually, or as a group within the school. Far from implementing a uniform curriculum, implementation of the Standards has corresponded with a flourishing of locally developed resources. Nor have these new standards meant a complete erasure of old materials. Though they are the least frequently used resources, teachers are still using lessons that were developed before the Standards were adopted. Looking at other publicly available resources, we see widespread use of materials provided by CMS, North Carolina, and other States, (68%, 59%, and 49% respectively), though usage seems to decrease as the agency becomes more ‘distant’ from the local level. That is, teachers seem more likely to turn to district developed materials before looking to the state level, and are more likely to look at their own state’s resources before looking elsewhere.

Figure 2.2. Teacher survey item: How frequently have you used the following resources for instruction in English language arts this school year?



Finding: We identified 4 distinct profiles of teacher resource use in our sample—heavy users, light users, users of established materials, and users of heterogeneous ‘other’ materials.

Figure 2.2 should not be taken to represent the typical teacher who responded to our survey. Because each teacher can (and usually does) draw on multiple sources for curricular resources every week, it is difficult to tell from this figure whether certain sources are more commonly paired together. To investigate this, we attempted to group respondents based on similar patterns of responses. We found four distinct profiles of teacher resource use in our sample:

- **Heavy users** - One group of teachers reported high rates of usage for resources from all available sources. This group represents about 35% of all teachers in our survey and potentially indicates a wide mix of curricular material in use on a weekly basis.
- **Light users** - On the opposite end of the spectrum, 17% of teachers consistently reported low levels of usage for resources from all sources. While they are slightly more likely to use school developed or commercially developed resources on a weekly basis, it is unclear which resources

that they are using regularly in their classrooms.

- **Users of established materials** - The third group of teachers, representing about 33% of respondents, relied heavily on three sources for curricular materials: their own school, the district, and the state. We would typify these teachers as relying on established materials provided to them by local and state education authorities. We might expect that across these teachers, curricular resources would look similar classroom to classroom, given their common origin.
- **Users of heterogeneous ‘other’ materials** - In contrast, the final group of teachers, representing about 14% of teachers, reported that their curricular resources tended to come from their school or from external organizations. We would expect that these teachers, unlike the teachers in the previous group, use a relatively heterogeneous set of resources.

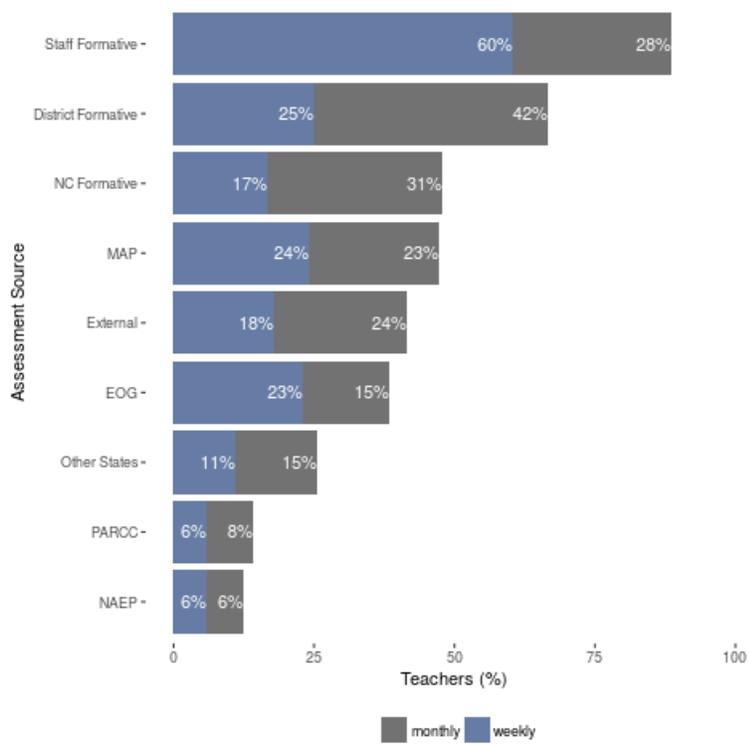
There is some evidence that these different groups are clustered within different schools, but all four profiles seem to be present in all grade levels. While it does not appear as though schools’ demographic characteristics (race, SES, prior test scores), are predictive of teachers’ membership in these groups, they provide a valuable framework for thinking about how teachers look for and use resources when confronted with a new set of standards.

Finding: The most commonly used Common Core-aligned assessment materials are formative assessments created by teachers and schools.

An essential part of teaching is the ability to monitor and assess your students’ learning. While there are many ways to do this effectively, a changing set of standards demands a changing set of assessments. Some of the most contentious and impactful debates around the implementation of the Standards have centered around the standardized tests used to measure students’ mastery of various skills and topics. However, assessments are not limited to only standardized tests. Teachers assess their students’ learning on a daily basis, sometime using tools associated with a standardized test, and sometimes using assessments developed by themselves or their schools. We surveyed Grade 3 teachers about what Common Core-aligned assessments they used in their classrooms; the responses are detailed in Figure 2.3.

By far the most commonly used assessment materials are formative assessments created by teachers and schools themselves. Whether examined on a weekly or monthly basis, internally created formative assessments are used substantially more often than the next most common type of assessments. This next tier of assessments includes district-created formative assessments as well as assessments specifically aligned with end-of-grade tests and the MAP test. Materials from PARCC are the least commonly used assessments. This is perhaps not surprising. Although PARCC is touted as being closely aligned with the Standards, North Carolina does not administer the PARCC on a statewide level.

Figure 2.3. Teacher item: How frequently have you used the following types of assessments aligned to the Common Core State Standards in English language arts this school year (2016-2017)?



K-2 Teachers’ Implementation of Foundational ELA Practices

Next, we turn to a descriptive analysis of K-2 teachers’ foundational ELA practices. In the survey, we asked teachers about a variety of individual classroom practices and instructional techniques. We then grouped these questions under four “foundational” literacy practices: phonemic awareness, phonics and print convention, comprehension strategies, and writing activities. See Table 1.2 for details on the specific skills falling under each practice.

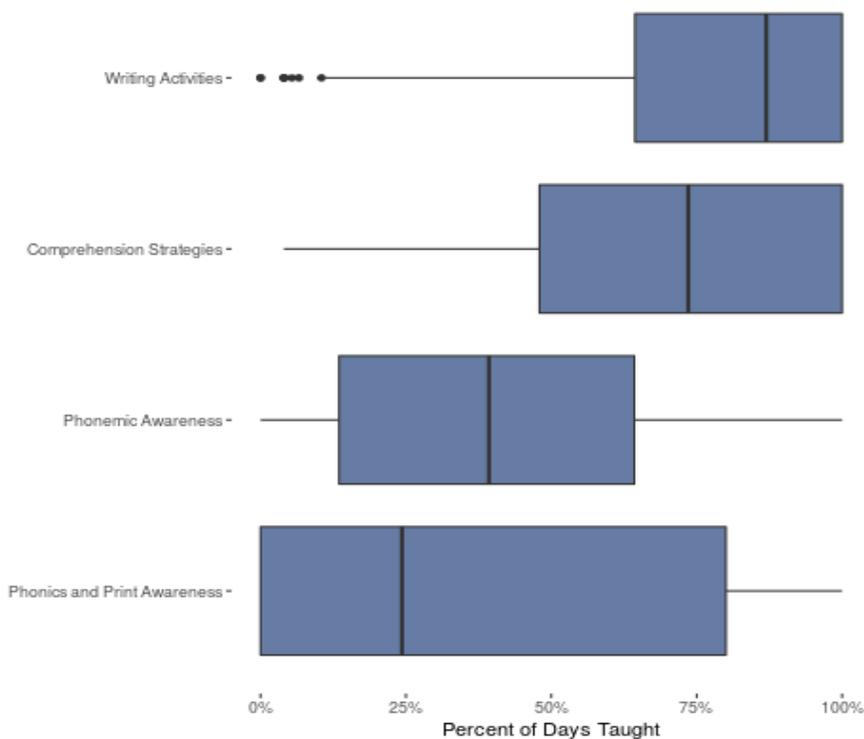
Finding: The typical K-2 teacher reported teaching foundational writing practices on 80% of school days and teaching phonics on 25% of school days. However, teachers varied widely in how often they reported teaching particular foundational ELA practices.

Figure 2.4 shows how often the typical K-2 teacher engaged in teaching each foundational ELA practice as well as the full range of teachers’ responses. The most frequently taught practice, according to teacher reports, was foundational writing, which included the following 5 skills: remembering and following directions that include a series of actions; using capitalization and punctuation; composing and writing complete sentences; composing and writing stories with an understandable beginning, middle, and end; and conventional spelling. The typical teacher reported teaching these skills on approximately 80% of school days over the course of the year. In fact, the top 34% of teachers reported including foundational writing instruction every day. This stands in stark contrast to previous research that has

found writing to be one of the least frequently taught topics in these grade levels (Connor, Ingebrand, & Dombek, 2013). In contrast, the typical teacher only taught phonics on about 25% of school days.

It is important to note that despite differences across foundational practices in the median percent of days taught, teachers reported use varied widely within any given practice. Thus, for example, although the median teacher included complex words instruction on 40% of school days, there are teachers in the sample who reported including this topic every single day and teachers who reported never including this topic in their daily lesson plan. This variability makes it possible for us to test whether associations exist between the frequency of these practices and student test growth.

Figure 2.4. Describing variation in K-2 foundational ELA practices across classrooms



Grade 3 Teachers’ Implementation of Common Core-Aligned ELA Practices

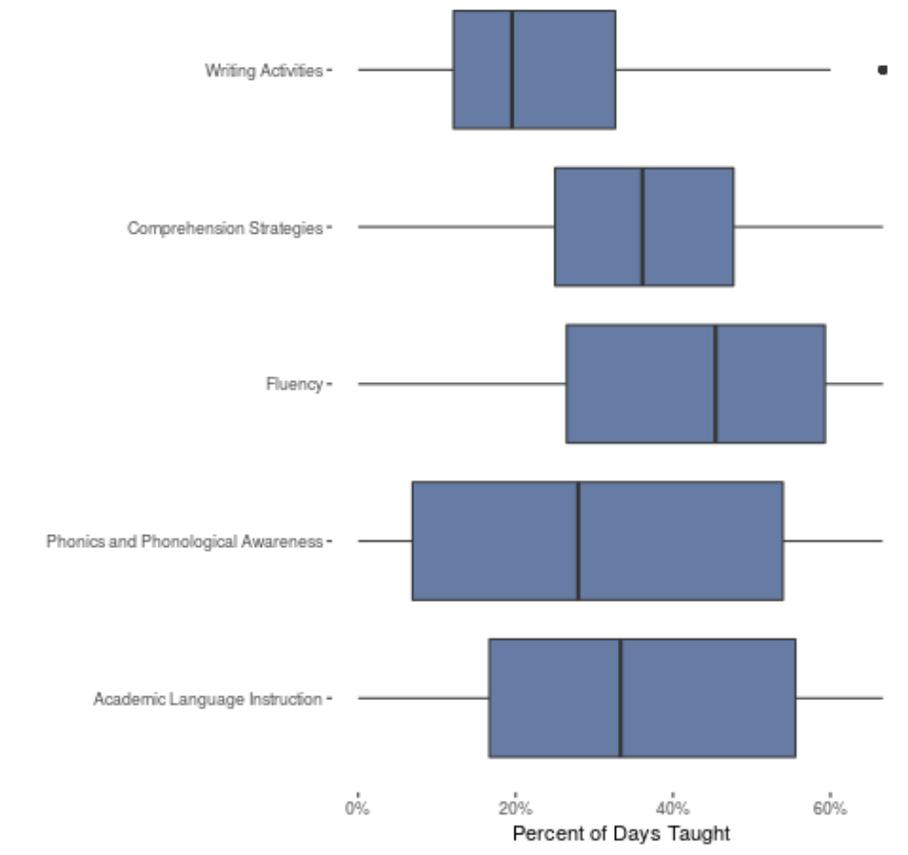
Finally, we turn to a descriptive analysis of Grade 3 teachers’ Common Core-aligned ELA practices. Similar to the questions asked of teachers in Grades K-2, we asked teachers about a variety of individual classroom practices and instructional techniques. We then grouped these questions under 5 broad “Common Core-aligned” literacy practices: phonics and phonological awareness, fluency, writing, comprehension, and academic language. While phonics and phonological awareness seems similar to the code-focused foundational practices of phonics and print conventions or phonemic awareness, the specific skills it measures are in general more complex and thus reflective of the rigorous nature of the Standards. Similarly, the Common Core-aligned writing practice represents higher order writing skills like writing opinion, narrative, and informational pieces, which are more complex than the foundational

writing skills such as crafting sentences or using correct capitalization and punctuation. Table B.6 in Appendix C includes the specific items that were administered to teachers and makes these differences more clear.

Finding: The typical Grade 3 teacher reported teaching Common Core-aligned writing practices on less than 20% of school days. She taught academic vocabulary knowledge, on 60% of school days. As in K-2 classrooms, Grade 3 teachers varied widely in how often they reported teaching particular ELA practices.

Figure 2.5 tells a story about the implementation of Common Core-aligned ELA practices among Grade 3 teachers. In contrast to K-2 teachers, writing is the least commonly taught literacy practice amongst typical Grade 3 teachers. This is not necessarily contradictory, as the specific skills measured in the two constructs are different. Thus, while early elementary students are spending a lot of time learning basic writing skills like spelling, punctuation, and narrative components, the growing complexity of their reading abilities is not necessarily matched with instruction in more complex and nuanced types of writing. Grade 3 teachers are much more likely to teach academic vocabulary knowledge to students, with the typical teacher incorporating this practice on approximately 60% of school days.

Figure 2.5. Describing variation in Grade 3 Common Core-aligned ELA practices across classrooms



Similar to early grade teachers, Grade 3 teachers exhibit wide variability in the frequency with which they teach particular ELA practices. With the exception of writing instruction, Grade 3 teachers exist at both extremes of frequency of practice. As mentioned above, this variability is what allows us to test for associations between these practices and student gains in test score outcomes. If all teachers spent the same amount of time on a given ELA practice, these practices would not differentiate between teachers whose students performed better at the end of the year and those whose students performed relatively worse, taking into account other differences between the groups.

Section III: Which K-2 Foundational ELA Practices are Associated with Student Literacy Outcomes?

Section summary: From Kindergarten to Grade 2, students must acquire the foundational skills that support strong word reading skills, fluency, comprehension, and writing. In this section, we examine whether K-2 foundational ELA practices predict student achievement on the MCLASS and MAP. Taken together, our findings suggest that there is no “one-size-fits-all” instructional practice. Rather, the impact of foundational ELA practices depends on children’s stage of reading development and key features of the school’s professional context.

- The impact of particular instructional practices depends on the stage of children’s reading development. For example, results from the MAP analysis indicate that phonemic awareness is positively associated with Grade 1 MAP outcomes. In Grade 2, however, phonics instruction plays a more critical role in promoting student achievement.
- The effects of specific foundational ELA practices are concentrated within Title I schools, suggesting that teachers in Title I schools must provide the additional supports that students from low-income backgrounds often require in order to match the growth in test scores that schools in more resourced communities typically see. For example, in Grade 1, the effects of code-focused instructional practices (phonics and print conventions, phonemic awareness) on students’ literacy outcomes are sensitive to school poverty, as well as the specific test used as an outcome measure.
- There is evidence based on teachers’ perceptions across multiple grades that school context plays a significant role in determining the relationship between writing instruction and student achievement on the MAP. In Kindergarten, teachers’ writing instruction has a stronger effect on student MAP outcomes in schools where teachers perceive stronger professional communities, as well as in schools perceived by teachers to be more academically rigorous.

In this section, we answer the following research questions:

- In Kindergarten to Grade 2, what is the association between teachers’ foundational ELA practices and student literacy outcomes after we account for differences in student background characteristics and the instructional context?
- Does the association between K-2 teachers’ foundational ELA practices and student literacy outcomes vary by the initial performance of students or the school context?

Recall the foundational ELA practices introduced earlier, which include two code-focused practices (i.e., phonics and print conventions, phonemic awareness) and two meaning-focused practices (i.e., comprehension strategies and writing activities). For example, “reading multi-syllable words” is a skill falling under the phonemic awareness practice, while “composing and writing complete sentences” is a skill falling under the foundational writing activities practice (See Table B.6 in Appendix B for more details.)

In Jeanne Chall’s stage theory of reading (Chall, 1983), students learn the form and function of print from birth to Pre-K (stage 0), begin to hear and manipulate speech sounds (stage 1), make explicit connections between letters and sounds (stage 1), and then “unglue” from print as they read connected text with greater speed and accuracy, freeing up the mind to focus on the meaning of text (stage 2). Teacher instruction plays a critical role in facilitating student foundational reading development from Kindergarten to Grade 2 (end of stage 0 to stage 2) as children prepare to enter stage 3—using reading as tool for acquiring knowledge across content areas (e.g., science, history, literature).

We find evidence for the role teachers play in these developmental trajectories when we investigate the relationships between foundational ELA practices and student outcomes, controlling for a variety of student and school contextual factors.

Finding: While Grade 1 students benefited more from instruction in phonemic awareness, Grade 2 students benefited more from instruction in phonics and print conventions.

In our analysis of students in Kindergarten through Grade 2, we investigate the relationship between foundational ELA practices and student outcomes. A summary of the relationships between these practices and student MAP scores can be found in Table 3.1. On average, Grade 1 students are predicted to enjoy larger MAP gains when their teachers devote more time helping students hear and manipulate the sounds of words. This same foundational practice, however, has no impact on Grade 2 students’ MAP performance. Consistent with Chall’s stage theory of reading, we found that, on average, different foundational ELA practices seem to matter at different stages of children’s reading development. In other words, the effects of certain practices on MAP outcomes depend on a student’s stage of reading development. As more students master the ability to hear and manipulate speech sounds in words, they are ready to make explicit connections between letters and sounds and appear to benefit more from phonics instruction in Grade 2.

Table 3.1. The Relationship Between Teachers’ K-2 Foundational ELA Practices and Student Outcomes

| Practice | Grade 1 MAP Scores | Grade 2 MAP Scores |
|--|--------------------|--------------------|
| Phonics and print convention | | + |
| Phonemic awareness | + | |
| Comprehension strategies | | |
| Writing activities | | |
| Note: + indicates a positive and statistically significant association, controlling for other factors. | | |

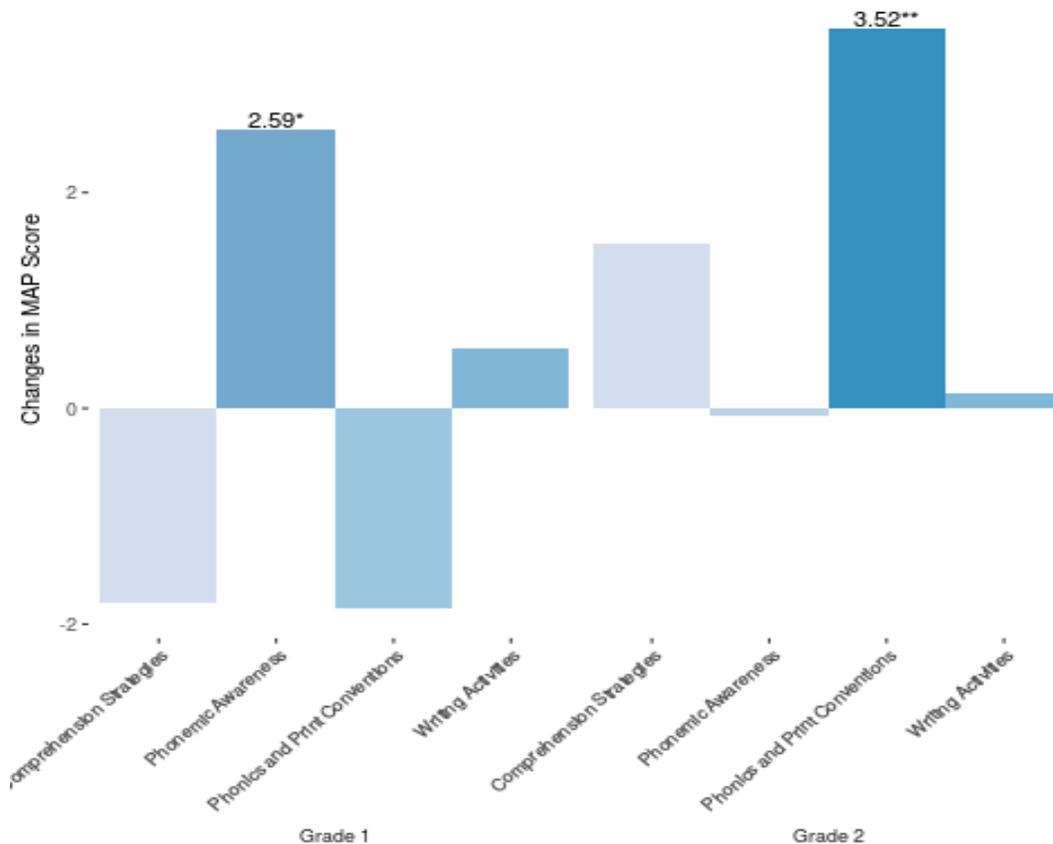
The magnitudes of these results for Grades 1 and 2 are presented in Figures 3.1 and 3.2. Each bar represents the predicted difference in MAP scores associated with the difference in providing no

instruction in that area and providing that instruction every day, controlling for other factors. If the differences are statistically significant, we can infer that there is also a relationship between variables in the population (i.e., all CMS K-5 schools).

- In Grade 1, receiving daily instruction on phonemic awareness is associated with scoring 2.6 points higher on the end-of-year MAP assessment relative to students who did not receive any such instruction, controlling for other factors. This is equivalent to 20% of the average growth in MAP scores over the course of Grade 1.
- In Grade 2, receiving daily instruction on phonics and print conventions is associated with scoring 3.5 points higher on the end of year MAP assessment relative to students who did not receive any such instruction, controlling for other factors. This is equivalent to about 30% of the average growth in MAP scores over the course of Grade 2.
- No other practices were associated with Kindergarten to Grade 2 student literacy outcomes.

Importantly, both the Grade 1 and Grade 2 main effects that meet the standard of statistical significance are elements of code-focused instruction and underscore the types of early literacy skills often emphasized in the lower grades. They also suggest possible leverage points for efforts to improve student performance.

Figure 3.1 (Left Bars) and 3.2 (Right Bars). Grade 1 foundational practices (phonemic awareness) are related to student literacy performance (MAP)

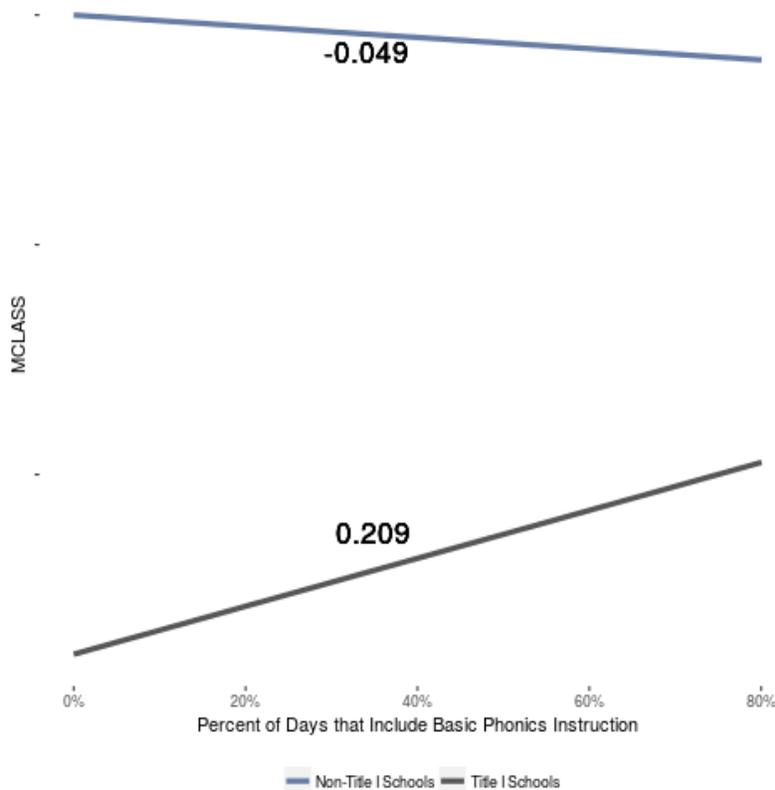


Finding: In Grade 1, the direction and strength of the relationships between instruction in phonics and print conventions and student literacy outcomes depends on both school poverty and the outcome being tested.

Although we did not find any statistically significant relationships between instruction in phonics and print conventions and student literacy outcomes among Grade 1 students overall on either MCLASS or MAP, we did find significant relationships when looking at students in Title I schools versus students in non-Title 1 schools. In other words, for Grade 1 students, we see that context plays a role in moderating the relationship between instructional practices and student outcomes.

Specifically, when assessing students on the MCLASS, which measures code-focused skills, we see that more phonics instruction is associated with better outcomes for students in Title I schools. This relationship is shown in Figure 3.3, where we see that controlling for other factors, a ten-percentage point difference in the amount of phonics instruction is associated with a 2.1 point difference in MCLASS scores for students in Title I schools and a -0.5 point differences for students in non-Title I schools.

Figure 3.3. There is a Positive Relationship Between Phonics and Student Literacy Achievement in Title I Schools When the Test (MCLASS) Assesses more Procedural Word Reading, Code-Focused Skills

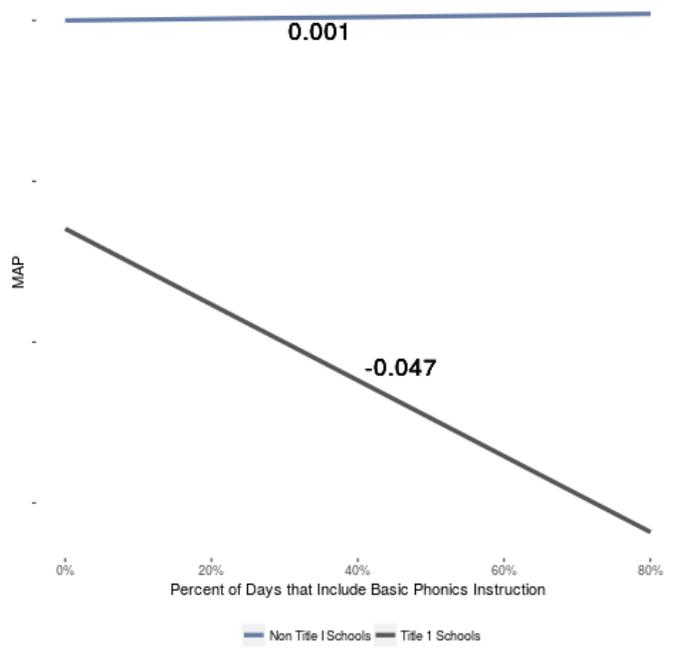


When students are assessed using a measure like the MAP that emphasizes meaning-based skills, however, we see the opposite relationship. Figure 3.4 shows how the relationship between instruction

in phonics and print conventions and Grade 1 literacy outcomes on the MAP differs for Title-I schools and non-Title I schools. For non-Title I schools there is no significant effect of this instructional practice, but in Title I schools, we find that a ten-percentage point difference in days of phonics instruction is associated with a -0.5 point difference in MAP scores, controlling for other factors.

In sum, for Grade 1 students overall, more phonemic awareness instruction appeared to benefit students on a meaning-focused test. For Grade 1 students in Title I schools, however, more phonics and print conventions benefited students on a code-focused assessment, but hurt them on a meaning-focused assessment.

Figure 3.4. However, there is a Negative Relationship Between Phonics and Student Literacy Achievement in Title I Schools When the Test (MAP) Assesses More Knowledge-Based Competencies



It is not surprising that the effects of specific foundational ELA practices are concentrated within Title I schools. While students from higher-income backgrounds often receive academic supports at home, low-income students are often more dependent on schools to support their learning (Entwisle, Alexander, & Olson, 2000). In other words, teachers in Title I schools must provide the additional supports that students from low-income backgrounds often require in order to match the growth in test scores that schools in more resourced communities typically see.

Even acknowledging the contextual differences between Title I and non-Title I schools, these findings may be surprising for many. How can more instruction be differentially associated with learning depending on the outcome? The answer is in the alignment between the types of instruction and the specific areas of reading ability that are measured on each test. Because the MCLASS emphasizes decoding and fluency skills in Grade 1, it makes sense that higher levels of instruction in phonics should

equip students to perform better when assessed on those skills. On the other hand, this increased instruction is not helpful when students are assessed on their ability to extract meaning from text, as on the MAP. This suggests that teachers who spend more time on phonics instruction may be spending less time on other foundational ELA practices. There is limited time in the school day so teachers are forced to make tough decisions about how to best allocate instructional time.

Finding: The direction and strength of the relationships between Kindergarten teachers’ use of foundational writing practices and MAP depends on teachers’ perceptions of their professional community and the academic rigor of the school curriculum (i.e., “school rigor”).

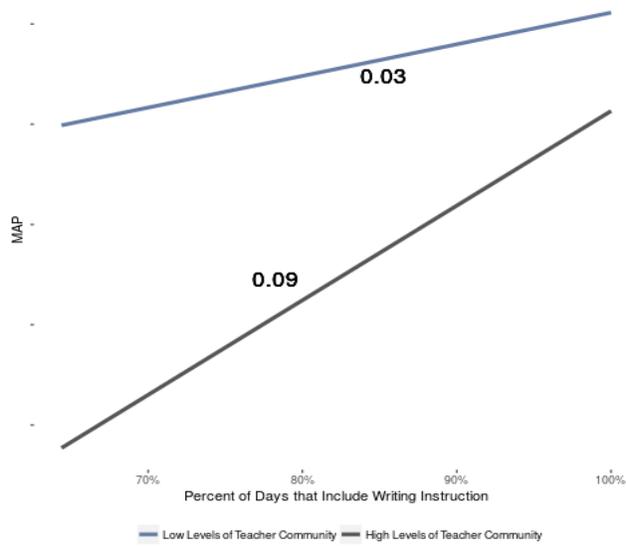
There is evidence from multiple grades that teachers’ perceptions of their school context play a significant role in determining the relationship between writing instruction and student achievement on the MAP. As shown in Table 3.2., we found statistically significant differences with respect to Kindergarten teachers’ perceptions of the teacher community and perceived school rigor.

Table 3.2. The Relationship Between K-2 Teachers Foundational Writing Practices and Student Outcomes Depend on the School Teaching and Professional context

| Variables | Kindergarten MAP Scores | Grade 1 Map Scores | Grade 2 MAP Scores |
|--|-------------------------|--------------------|--------------------|
| Teacher Community * Writing | + | | |
| Teacher Perceptions of School Rigor * Writing | + | | |
| Programmitis * Writing | | | - |
| Note: “+” indicates a positive and statistically significant association, controlling for other factors and “-” indicates a negative and statistically significant association, controlling for other factors. | | | |

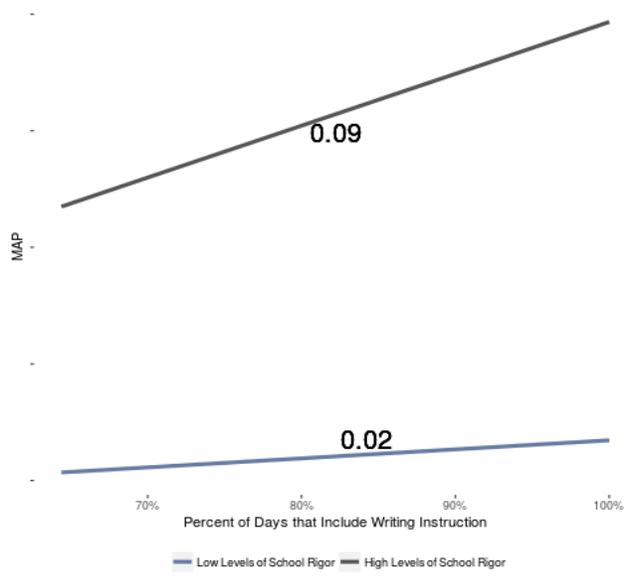
Teachers’ perceptions of their professional community and perceived school rigor are both significant contextual features for predicting kindergarteners’ achievement on the MAP. Figure 3.5. shows that while more days spent on writing instruction is slightly positively associated with student MAP performance, this relationship is much larger for teachers who feel that their school has a strong teacher community. For teachers with a perceived low level of community, a ten-percentage point difference in the amount of writing instruction is associated with a 0.3 difference in MAP scores. Students of teachers who perceive a stronger sense of community, on the other hand, notice a difference in MAP scores that is three times as large (0.9 scale points) associated with the same difference in instruction.

Figure 3.5. The Relationship Between Writing Instruction and K-MAP Performance in Kindergarten Depends on Teacher Perceptions of Their Professional Community



We also see that the effect of more writing instruction differs by the teacher’s perception of the academic rigor of the school curriculum in Kindergarten. As shown in Figure 3.6, there is only a slight positive relationship between writing instruction and student performance in Kindergarten for students of teachers with low levels of perceived school rigor. However, there is a larger relationship between writing instruction and MAP scores when teachers report high levels of school rigor (0.9 scale points associated with a ten-percentage point difference in writing instruction).

Figure 3.6. The Relationship Between Writing Instruction and K-MAP Performance Depends on Teacher Perceptions of The Academic Rigor of the School Curriculum



Thus, we see that in Kindergarten, the relationship between writing instruction and student achievement is particularly sensitive to variation in school context. In particular, more time spent on the instruction of foundational writing activities may only be helpful for students if their teachers have positive perceptions of their school's academic rigor and of the perceived sense of community among fellow teachers. It is also worth highlighting that these relationships are more noticeable for writing than for other foundational ELA practices, suggesting that in Kindergarten, context may be more important for meaning-focused skills than for code-focused skills.

Conclusion

This section has presented results from the analysis of foundational ELA instructional practices on student achievement in Kindergarten, Grade 1, and Grade 2. There are three key takeaways from this analysis. First, the relationship between instructional practices and student outcomes is meaningfully related to the student's developmental stage, and as a result, different practices may be more or less effective for different grade levels. Second, in Title I schools, the effects of specific instructional practices depend on the skills measured by the student assessment. Finally, the positive relationship between writing instruction and student outcomes is highly dependent on having a strong school context, supporting existing theory that teachers' effectiveness can be shaped by their professional environments.

Section IV: Which Grade 3 Common Core-Aligned ELA Practices are Associated with Student Literacy Outcomes?

Section summary: In Grade 3, students must demonstrate proficiency on three different assessments – the MCLASS, MAP, and NC End-of-Grade Reading Test. In this section, we examine whether Grade 3 teachers’ Common Core-aligned ELA practices predict student performance on each of these three student literacy assessments. In sum, we found that Grade 3 teachers’ enactment of Common Core-aligned practices matter most for students in higher-poverty Title I schools and in schools with stronger teacher professional communities.

- The extent to which teachers provide instruction in (a) academic language, (b) fluency, and (c) writing has a stronger and more positive relationship with student literacy achievement in Title I schools.
- Teachers’ Common Core-aligned writing practices have a stronger relationship with the MAP and the NC EOG tests in schools where teachers perceive a stronger sense of professional community.
- District initiatives such as ILTs and the year 3 ILT emphasis on writing with evidence may facilitate efforts to improve outcomes for low-income children and struggling readers at scale.

Overall, we do not find consistent, statistically significant evidence either for or against any particular teacher practice in Grade 3 when we look at the practices in the absence of school and student level contextual factors. While not discussed in depth here, regression results for these broader analyses can be found in Appendix D. However, as with the foundational ELA practices explored in the previous section, we do find evidence that meaningful relationships between Common Core-aligned practices and student outcomes exist when they are moderated by characteristics of the students and school context. In short, the association between teachers’ implementation of Common Core-aligned ELA practices and student outcomes are highly context dependent.³

Finding: The relationship between Grade 3 teachers’ Common Core-aligned ELA practices and student literacy outcomes depend on Title I status.

Title I status is a major factor in shaping school context across the United States. This role is highlighted in Table 4.1, which shows how Title I status (i.e., Title I and non-Title I schools) interacts with and moderates the relationship between teachers’ ELA instructional practices and various student outcomes. On the MCLASS, there are positive and statistically significant interactions between Title I status and academic language and between Title I status and writing. On the MAP, there are also

³ We tested for “statistical interactions” between each teacher practice and features of the school context. The existence of an interaction effect means that there is a multiplicative—not merely additive—effect of the practice when examined in the presence or absence of some moderating or mediating contextual factor.

positive interactions between Title I status and fluency. There were no statistically significant differences in EOG scores based on differences between Title I status and instructional practices.

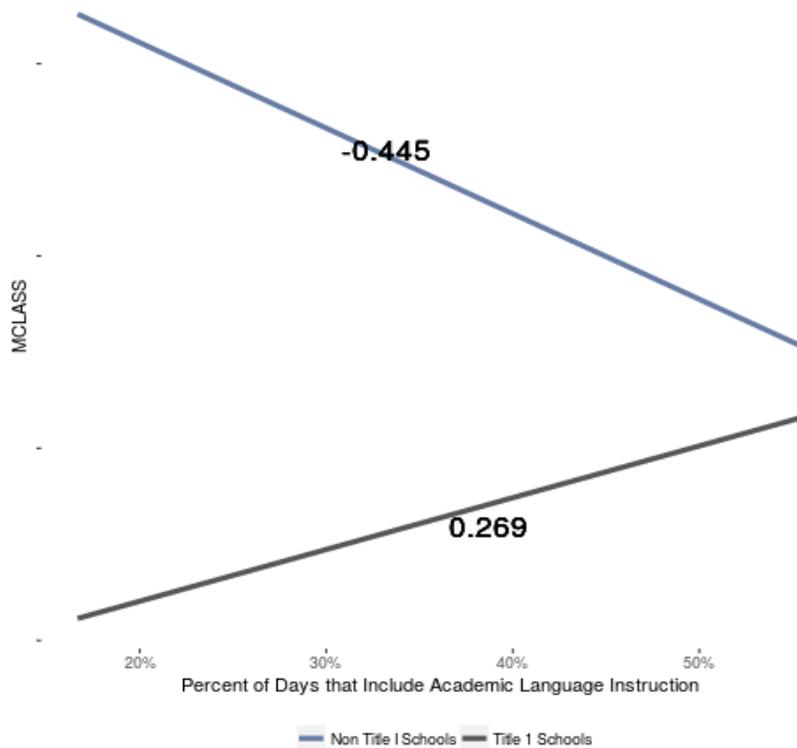
Table 4.1. The Relationship Between Grade 3 Teachers’ Common Core-Aligned Practices and Student Literacy Outcomes Depend on Title I Status

| Variables | MCLASS | MAP | EOG |
|--|--------|-----|-----|
| Title I * Academic Language | + | | |
| Title I * Phonics/phonological awareness | | | |
| Title I * Fluency | | + | |
| Title I * Writing | + | | |
| Title I * Comprehension | | | |
| Note: “+” indicates a positive and statistically significant association, controlling for other factors. | | | |

We explore each of these three significant findings in more depth.

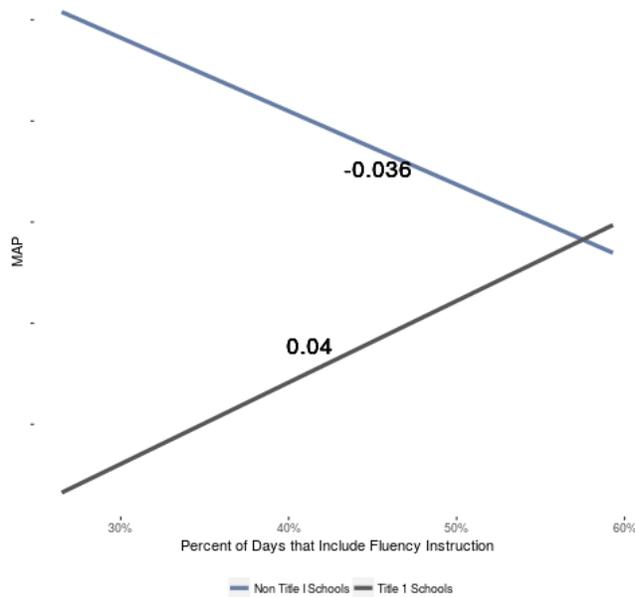
1. **On the MCLASS, there are positive and statistically significant interactions between Title I status and academic language.** Figure 4.1 shows how the relationship between academic language instruction and student MCLASS scores is different in Title I schools compared to non-Title I schools for Grade 3 students, controlling for other factors. In non-Title I schools, ten percentage points of additional days of academic language instruction is associated with a -4.5 point difference in MCLASS scores. The relationship is very different in Title I schools, where the same difference in additional academic language instruction is associated with a 2.7 point *increase* on the MCLASS assessment.

Figure 4.1. The Effects of Academic Language Instruction Are Different in Title I than Non-Title I Schools



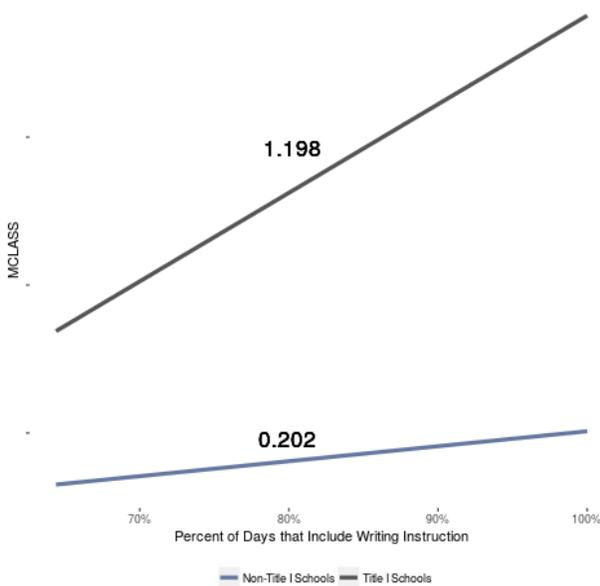
2. **On the MAP, there are positive interactions between Title I status and fluency instruction.** We see a similar pattern when we look at the relationship between fluency instruction and student outcomes on the MAP. Whereas more regular instruction in fluency is associated with lower outcomes for students in non-Title I schools, the opposite is true in Title I schools, with higher amounts of fluency instruction associated with better student performance. Focusing on Title I schools, we see that ten percentage points additional days of instruction in fluency is associated with a difference of 0.4 points for third graders, controlling for other factors. The relationship is almost perfectly opposite in non-Title I schools.

Figure 4.2. The Effects of Fluency Instruction Are Different in Title I and Non-Title I Schools



- On the MCLASS, there are positive and statistically significant interactions between Title I status writing.** The differences in the effects of writing instruction show a slightly different pattern. In Non-Title I schools, there is no statistically significant relationship between the amount of writing instruction and student outcomes, controlling for other factors. However, in Title I schools, there is a large positive relationship, such that an additional ten percentage points of days including writing instruction is associated with a 12-point difference in MCLASS scores.

Figure 4.3. The Effects of Writing Instruction Are Different in Title I and Non-Title I Schools



Taken together, the previous three figures have implications for how teachers and schools should think about allocating instructional time. None of these practices are associated with higher test scores when looking at all students pooled together. However, each of them can potentially make some impact in closing the gap between Title I and non-Title schools.

Finding: Teachers’ use of Common Core-aligned writing practices have a more positive relationship with the MAP and EOG in schools where teachers perceive that their community is strong.

While Title I status is an important measure of context for schools, we also investigate the role of other contextual features. We find consistent evidence that teachers’ use of Common Core-aligned writing practices have a more positive relationship with the MAP and EOG in schools where teachers perceive that their community is strong. As shown in Table 4.2, this finding is replicated across the MAP and EOG literacy outcomes, though it is not found for the code-focused MCLASS.

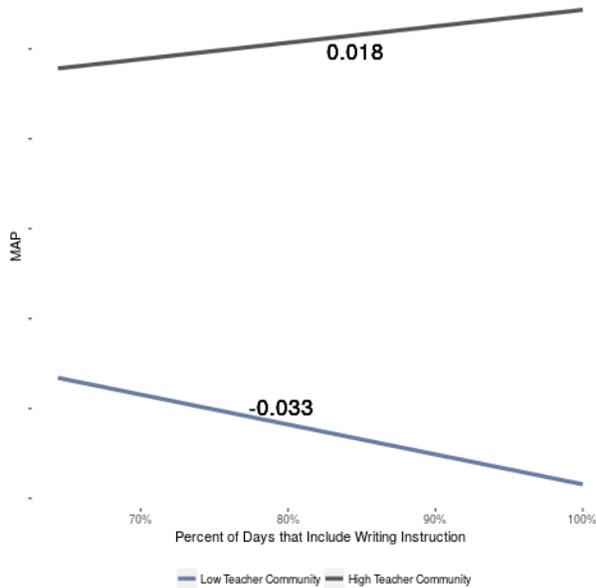
Table 4.2. The Relationship Between Grade 3 Teachers’ Common Core-Aligned Writing Practices and EOG Reading Scores Depend on Perceived Teacher Community

| Variables | MCLASS | MAP | EOG |
|--|--------|-----|-----|
| Perceived Teacher Community * Academic Language | | | |
| Perceived Teacher Community * Phonics/phonological awareness | | | |
| Perceived Teacher Community * Fluency | | | |
| Perceived Teacher Community * Writing | | + | + |
| Perceived Teacher Community * Comprehension | | | - |
| Note: “+” indicates a positive and statistically significant association, controlling for other factors and “-” indicates a negative and statistically significant association, controlling for other factors. | | | |

Figure 4.4 illustrates relationships between writing instruction and student achievement on the MAP in schools with differing levels of perceived teacher community. Among teachers who perceive a low sense of teacher community in their school, a larger percentage of days spent on writing instruction is associated with lower MAP scores for their students. Among teachers who perceive a high sense of teacher community, however, there is a slight positive relationship between writing instruction and student outcomes, such that a ten-percentage point difference in the amount of writing instruction is

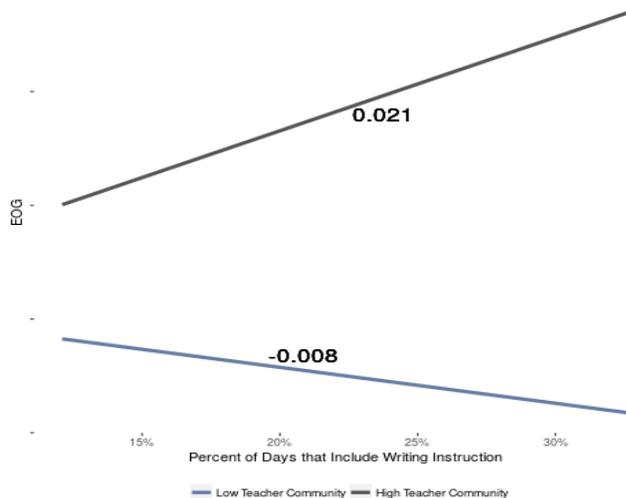
associated with a 0.2 difference in MAP scores.

Figure 4.4. The Relationship Between Writing Instruction and Student Achievement on the MAP is Positive in Schools with Stronger Perceived Teacher Communities



Similarly, Figure 4.5 displays the relationships between teacher community and writing instruction on the EOG assessment in schools with differing levels of perceived teacher community. We see the same relationship in that teachers who perceive a low sense of teacher community in their school see a slight negative relationship between writing instruction and EOG scores for their students, whereas teachers who perceive a high sense of teacher community see a positive relationship.

Figure 4.5. The Relationship Between Writing Instruction and Student Achievement on the North Carolina EOG Reading Test is Positive in Schools with Stronger Perceived Teacher Communities



These two figures, taken together with the results in Section III, provide strong evidence for the role of teacher professional communities in moderating the relationship between writing instruction and student outcomes. We find a positive and statistically significant relationship between meaning-focused writing instruction and student outcomes for teachers who perceive strong teacher communities at their school. Moreover, these results are replicated across two assessments of students' knowledge-based competencies, the MAP and EOG, and across Kindergarten, Grade 1, and Grade 3. This indicates that this measure of school context may be important for both the foundational writing practices emphasized in the early grades as well as for more complex writing skills emphasized in Common Core-aligned third grade instruction.

Conclusion

In sum, our findings indicate that Grade 3 students in Title I schools perform better when they are provided with both code-focused instruction (e.g., fluency) and meaning-focused instruction (e.g., academic language and writing). At the same time, however, we do not find overall effects of any of these practices, suggesting that providing Common Core-aligned ELA instruction is not sufficient to elicit changes in student performance broadly speaking. Moreover, the effectiveness of different components of instruction is dependent on school context.

Section V: How is Curricular Resource Use Associated with Student Literacy Outcomes? Zooming Out to the Whole District

Section summary: This section takes a broad view and explores the relationship between the use of specific ELA resources and student outcomes for third graders. It includes literacy facilitator-reported usage of these resources from every elementary school in the district. We find that higher reported usage of CMS planning resources is associated with negative differences in student scores on the MAP and EOG, but only in non-Title I schools. These models should be interpreted with caution, given the correlation between resource use and other, unmeasured contextual factors, but they suggest that further research into the nature of resource use may be worthwhile.

While not a primary research question of this study, the research team was also interested in the role of literacy curricular materials and their association with student outcomes. During the 2016-2017 academic year, CMS literacy facilitators provided information on the use of different commercial curricula for ELA instruction in every grade in their school. Unlike the survey we administered, this data was collected in every CMS elementary school and thus provides an opportunity to look at factors affecting student achievement beyond our survey sample.

In asking how curricular resource use is associated with student outcomes, we employed a similar methodological approach as in the survey analyses in previous sections. However, it is important to note that because we were including students from across the district, the available control variables were more limited. Importantly, these although these results do account for prior student achievement and demographic characteristics, we are not able to control for the teacher level reports of practices and perspectives on school culture. At the school-level, we control for the school's Title I status.

While we find no evidence of a relationship between curricular use and student scores on the MCLASS, we do see negative and statistically significant relationships between use of CMS planning resources and MAP and EOG score and between the use of other commercial resources on EOG scores. These results are summarized in Table 5.1, but as was the case for analyses in previous sections, these main results mask considerable variation with regards to Title I status of schools.

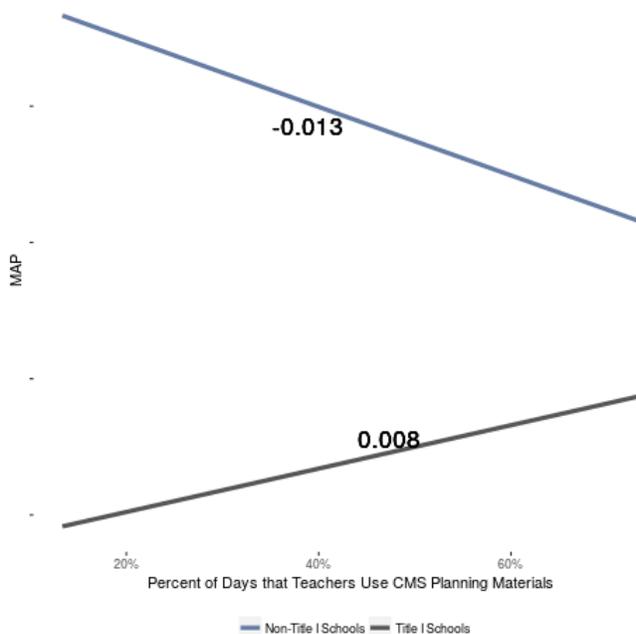
Table 5.1. The Relationship Between Grade 3 Teachers' Curricular Use and Student Literacy Outcomes

| Variables | MCLASS | MAP | EOG |
|-----------------------------------|--------|-----|-----|
| Use of CMS Planning Resources | | - | - |
| Use of CMS Curricular Resources | | | |
| Use of Other Commercial Resources | | | - |

Note: "-" indicates a negative and statistically significant association, controlling for other factors.

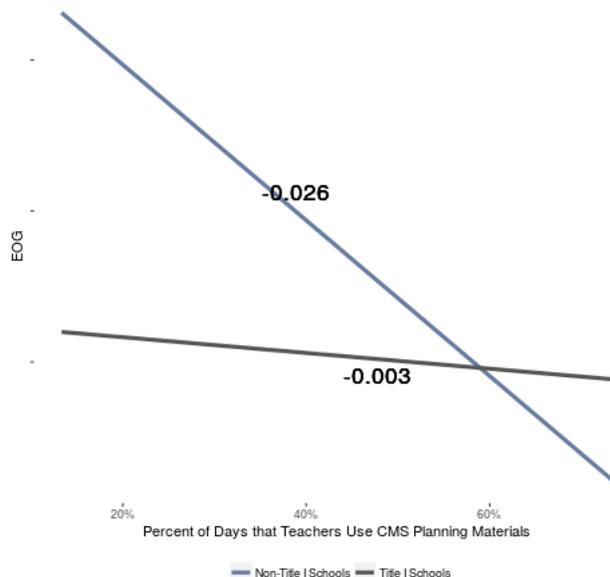
We find that the negative controlled associated between use of CMS resources and student outcomes on the MAP and EOG is starkly different for students in Title I and non-Title I schools. Moreover, the negative effect is entirely driven by non-Title I schools. In Figure 5.1, we see these differential relationships with MAP scores. The slope for non-Title I schools indicates that an additional 10 percentage point of days using CMS Planning Resources is associated with a -0.13 difference in MAP scores for third graders. At the same time, however, the slope for Title I schools is slightly positive, implying the opposite relationship.

Figure 5.1 The Differential Effects of CMS Planning Resources in Title I Schools and non-Title I Schools (MAP Scores)



We see a similar pattern for EOG scores, as shown in Figure 5.2. Here there is no meaningful relationship between CMS planning resources in Title I schools, whereas in non-Title I schools a ten percentage point difference in their use is associated with a -0.3 difference in EOG scores.

Figure 5.2 The Differential Effects of CMS Planning Resources in Title I Schools and non-Title I Schools (Grade 3 EOG Scores)



The results from this section should be interpreted with caution for two different reasons. First, because this analysis looks at these relationships for all third grade students in the district, we are unable to control for measures of school and classroom context that we know are important, such as the school climate indices. Given the vital role school climate plays and its importance for our findings in Sections III and IV, resource use is likely highly correlated with other contextual factors that we are not able to account for in this model. The second caveat is that these CMS planning resources are not necessarily intended to be used on a day-to-day basis. Thus, literacy facilitators who are reporting very frequent use of these resources may be working with teachers who have very different planning processes and activities than the district intended. Even more so than previous sections, this analysis indicates that additional research into the nature of resource usage instead of just its frequency may be helpful in understanding their helpfulness in supporting student learning.

Finally, we think it is important here to again restate the caution that these findings should not be thought of as describing a causal relationship. The current study does not have the ability to look at these relationships over time, so we cannot say that schools who switched to or from higher usage of CMS resources experienced changes in their test scores. Indeed, it is possible that schools who were already low performing were targeted by the district and encouraged to use more of the CMS resources. If this were the case, we would see the above set of findings, but it would imply an entirely different set of responses by the district. What these findings should do is spark conversations and questions both among CMS district personnel and within schools that are grappling with designing literacy curriculum.

Section VI: Conclusion

In the CMS schools, teachers have largely embraced the Common Core State Standards in English language arts and are now working to implement those standards in their classrooms. Our descriptive findings clearly suggest that there is now strong support for the CCSS throughout the Charlotte-Mecklenburg.

Despite the strong support for the CCSS, CMS faces the daunting challenging of accelerating student progress on a range of literacy assessments. We find consistent evidence across grades that student achievement is fast in the fall, slows down in the spring, and separates in the summer, as individual differences in literacy achievement expands over the summer months.

In essence, our main results indicate that practices matter. After we control for student background and the classroom context, there are several ELA practices that predict student achievement at the end of the school year. Moreover, it appears that ELA practices are a more powerful influence on student achievement in high-poverty schools and in schools where teachers perceive stronger professional communities. Our findings lead us to five principles, each of which is backed up by empirical findings from this study and the broader research literature. We hope that these principles can provide a strong foundation for a CMS literacy strategy.

Principle 1: Match and personalize ELA practices to children’s literacy needs at particular stages of development. In CMS, teachers’ use of foundational ELA practices in the early grades predict end-of-year student MAP outcomes; however, the specific practices depend on the stage of reading development. In Grade 1, teachers’ foundational ELA practices in phonemic awareness predicted end-of-year student MAP outcomes. In Grade 2, teachers’ foundational ELA practices in phonics predicted end-of-year MAP outcomes. These findings are consistent with broader research findings:

- One seminal model of reading development suggests that children proceed through stages, beginning with a pre-reading stage (ages 0-6), continuing through a “learning to read” stage (grades 1-3) and then a “reading to learn” stage (Chall, 1983).
- Additionally, a recent meta-analysis examining the effects of reading interventions for at-risk readers calls for developmental understanding of reading remediation (Suggate, 2010). For example, the authors found that interventions targeting code-based skills were more effective through Grade 1, while meaning-focused interventions and interventions that targeted both code and meaning were more effective after Grade 1.

Principle 2: Integrate code and meaning-focused instruction in high-poverty schools to move multiple literacy outcomes. In Title I schools in CMS, code-focused instruction is positively associated with student performance on tests that assess code-focused skills. However, code-focused instruction is negatively associated with performance on tests that assess meaning-focused skills. These findings are consistent with prior research and lead to several broader principles:

- It would be a mistake to teach only code-focused skills in the early grades or only meaning-focused skills in the later grades. Rather, in making decisions about which skills to teach students, teachers should consider individual student ability (e.g., vocabulary and decoding). Research suggests that integrating code and meaning-focused instruction and personalizing the balance of that instruction to meet students' individual needs is key (Foorman et al., 2016).
- A number of studies have underscored the importance of small-group instruction; however, how to make the best use of that time depends on the skills of the individual students. In one study, Grade 1 students with weaker word-recognition skills in the fall benefited most from teacher-directed code-focused instruction, while students with stronger word-recognition skills in the fall benefited from less of this type of instruction (Connor et al., 2009). In the same study, students with weaker vocabulary skills benefited from small amounts of child-directed meaning-focused instruction, gradually increasing in duration across the year; whereas students with stronger vocabulary skills benefited from more of this type of instruction across the whole year.

Principle 3: Writing instruction can improve students' reading ability when teachers' professional contexts are strong. In CMS, writing practices appeared to have a particularly strong positive association with student literacy achievement. This is only true, however, in schools with stronger professional communities. Additionally, positive associations between writing and student literacy outcomes were weaker in schools where teachers perceived that programitis was a problem. The importance of writing instruction in improving reading comprehension has been highlighted in numerous studies:

- Prior studies on literacy instruction have shown that teachers in Title I schools devote an average of 5 minutes per literacy block to writing in Grade 1 and even less time in Grade 3 (Connor, Ingebrand, & Dombek, 2013). Research looking at students in grades 4 through 6 found that, in addition to spending little time on writing, writing activities rarely gave students an opportunity to engage in extended writing or analytic thinking (Graham & Hebert, 2011).
- Increasing both the amount of writing in literacy instruction and the breadth of writing activities over multiple days has been shown to powerfully impact both students' writing and reading outcomes (Collins et al., 2017; Graham & Hebert, 2011).

Principle 4: For children in Title I schools, we find evidence that academic language instruction, writing, and fluency are positively associated with third-grade reading outcomes. Academic language and writing are practices that rarely occur in many US public schools, particularly high-poverty schools. Yet, they appear to be high-leverage Common Core-aligned practices that are particularly important in third-grade. Furthermore, children's ability to read text with fluency--speed, accuracy, and oral expressiveness--can serve as the theoretical bridge between decoding and comprehension. Together, the integration of meaning-focused practices that rarely occur in high-poverty schools and code-focused fluency practices seem most beneficial in Title I schools.

Principle 5: The most consistent finding in this report is that Grade 3 teachers' Common Core-aligned writing practices have stronger effects on student literacy outcomes in schools with stronger professional communities. Findings that replicate across different tests merit greater confidence than

those that are simply observed on a single test. We find consistent evidence that Common Core-aligned writing instruction predicts student literacy achievement - but this relationship is strongest in schools where teachers perceive that there is a strong professional community. In some respects, this finding underscores the importance of enhancing the coherence of school Instructional Leadership Teams as CMS teachers aim to teach students how to write with evidence in response to complex informational text.

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Appendix A: Survey Research Checklist

Table A.1: Applying a Survey Research Checklist to the CMS Literacy Survey

| Short Checklist for Survey Research | Current Study |
|--|--|
| <p>Research questions (1-3)</p> <p>1. Does the report contain a list of specific research questions or issues the survey is intended to address?</p> <p>2. Do the research questions posed by the investigators appropriately and adequately address the topic of the survey; e.g., in a survey on poverty in the United States, does the research include an examination of poverty as a function of race, level of education, and geographic location?</p> <p>3. Are the research questions posed by the investigators well organized and well structured?</p> | <ul style="list-style-type: none"> · Questions based on empirical research related to teacher practices and student outcomes and theoretical research on the role of student and school level moderators of teacher practices · Section 1 – lists research questions |
| <p>Sampling and response rates (items 4-11)</p> <p>4. Does the report identify the target population to which generalization was desired?</p> <p>5. Does the report describe available sampling frames?</p> <p>6. Does the report indicate a close match between the target population and the operational population?</p> <p>7. Does the report describe the sampling procedures used? Were probability sampling procedures used?</p> <p>8. Are nonresponse rates reported for the entire survey and for individual questions?</p> <p>9. Were nonresponse rates low enough to avoid substantial bias errors?</p> <p>10. Are any analyses of potential sampling bias reported?</p> <p>11. Are sample sizes sufficient to avoid substantial random errors? Are standard errors of estimate reported?</p> | <ul style="list-style-type: none"> · Probability sample of 30 schools and K-5 teachers who served as primary ELA instructor · Section 1 – details sampling procedures, overall response, and comparisons between surveyed and non-surveyed schools |

| | |
|---|---|
| <p>Instrumentation (items 12-18)</p> <p>12. Is the primary mode of data collection (i.e., mailed questionnaires, telephone interviews, face-to-face interviews) consistent with the objectives, complexity, and operational population of the survey?</p> <p>13. Are survey instruments provided in the report?</p> <p>14. Are instructions for completing the survey clear and unambiguous?</p> <p>15. Are questions on instruments clear and unambiguous?</p> <p>16. Do questions on instruments encourage respondents' honesty in admitting lack of knowledge or uncertainty?</p> <p>17. Are questions on instruments free from obvious bias, slanting, or "loading"?</p> <p>18. Was the survey consistent with ethical research practice; e.g., was the anonymity and/or confidentiality of respondents protected?</p> | <ul style="list-style-type: none"> · Teacher survey appended to Appendix B · Instructions provided to teachers · Items drawn from validated questions used in the ECLS-K (Early Childhood Longitudinal Survey, Kindergarten Cohort), including 1999 items for K-2 foundational practices, and 2010 items for G3 Common Core-aligned practices |
| <p>Data-collection procedures (items 19-20)</p> <p>19. Does the report contain a description of field procedures?</p> <p>20. Are field procedures adequate and appropriate? Is it likely that major sources of bias error have been avoided?</p> | <ul style="list-style-type: none"> · Data collection procedures and field operations described · Section 1 – details on field operations and procedures for obtaining at least an 80% response rate from teachers |
| <p>Analyses and conclusions of report (items 21-26)</p> <p>21. Are data analyses clearly described?</p> <p>22. Are data analyses appropriate to the purposes of the survey?</p> <p>23. Did the survey provide answers to the research questions posed by the investigators?</p> <p>24. Are the researchers' conclusions sound, or are alternative interpretations of findings equally plausible?</p> <p>25. Does the survey report contain descriptions of deviations from plans for survey implementation and the likely consequences of such deviations?</p> <p>26. Does the survey report contain an analysis of the quality of the survey?</p> | <ul style="list-style-type: none"> · Data analyses for descriptive findings on Common Core implementation; see Appendix C · Data analysis for regression findings on the relationships between teachers' ELA practices and student outcomes, and practices by school context interactions in K-2; see Section 3 · Regression results for G3; see Section 4 |

Adapted from Jaeger's (1997, pp. 475-476) full survey evaluation checklist presented in Table 18.1.

Appendix B: Technical Appendix

Validity of Inferences in Survey Research and Experimental Research

Research design determines the validity of the conclusions we ultimately infer from research findings. To be more concrete, some reports like “Writing to Read,” which is guiding the Year 3 ILT work of CMS schools, include findings from randomized controlled trial designs. As such, those designs allow us to infer that practices such as teaching writing strategies caused improvements in student outcomes. These studies have high “internal validity” because they permit valid cause-effect inferences; yet, they often have low “external validity” because the inferences may not generalize to new contexts. Survey research in which schools are randomly selected from a larger population often have high external validity but low internal validity. In other words, findings from the CMS Literacy Survey allows us to make generalizations to the entire population of CMS K-5 schools and to infer that relationships and correlations between practices and outcomes hold across the entire school district. However, the study has low internal validity because teachers’ ELA practices were not randomly assigned to school. While we account for numerous measured characteristics of the students, classrooms, and schools in this study, it is always possible that myriad unmeasured variables (e.g., family socioeconomic status, principal leadership, teachers’ educational background) may be responsible for the results we find. Instead of interpreting these findings as describing a causal relationship, we hope that they highlight potential “high-leverage” practices that could be included in the next phase of intervention research.

Development of the Final Analytic Sample

Identifying Schools

The primary aim of the sampling procedure was to ensure the study included a representative group of students, teachers, and schools in the district. For ease of implementation, the team decided to use a stratified cluster sampling approach.

Schools in Charlotte-Mecklenburg are grouped administratively into Learning Communities, which are loosely based on geographic regions within the district. Upon advice from CMS, this administrative unit was used to stratify our sample. CMS has 10 distinct Learning Communities, but one of these includes only a single school, the “Military and Global Leadership Academy”. For the purposes of sampling, this school was grouped with its nearest geographic neighbor Learning Community, Central. This resulted in 9 remaining Learning Communities from which schools were randomly selected into the study. The probability of selection of each school was thus proportional to the number of elementary schools in their Learning Community overall. This ensured that larger Learning Communities had more schools in the study sample. As shown in Table B.1, between 2 and 5 elementary schools were selected from each of the CMS Learning Communities.

Table B.1. School Sample by Learning Community

| Learning Community | Number of Elementary Schools | Number of Elementary Schools Randomly Sampled for Survey |
|--|------------------------------|--|
| Beacon | 8 | 2 |
| Central + Military and Global Leadership Academy | 22 | 5 |
| East | 14 | 4 |
| LIFT | 7 | 2 |
| North | 19 | 5 |
| Northeast | 11 | 3 |
| South | 19 | 5 |
| West | 10 | 4 |
| Total | 110 | 30 |

Identifying the Teacher and Student Sample

Within each sampled elementary school, the team attempted to survey every teacher responsible for ELA instruction in Kindergarten through Grade 5. Preliminary rosters were pulled from school websites and principals had the opportunity to add and remove individuals to ensure the final list was up-to-date with current staffing. Based on these lists, surveys were sent to the 1038 identified individuals, of whom 900 responded, for an overall response rate of 87%.

Of the 900 teacher responses, 772 (86%) were matched as the primary source of ELA instruction for a student in one of the thirty surveyed schools. Similarly, of the 19,188 students attending these schools, 18,320 (95%) of them were matched with a teacher who responded to the survey. Thus, overall, the base student sample represents the vast majority of students in these schools. The analysis in this report focuses exclusively on students in Kindergarten through Grade 3. These students were included in the analysis if they had any of the outcome measures explored in this study: end of year MAP or MCLASS scores, or, for third-graders, EOG reading scores.

Measures of Context and Instructional Practice

An integral part of the research project involved identifying and refining measures of context and instructional practice for inclusion in the regression analyses. Instructional practices were used as primary predictors of student achievement. The contextual measures were used in three key ways: first, as controls to help account for the reasons that different teachers choose to use different types of

instructional practices; second, they were used as predictors of academic achievement in the district-wide analysis; and finally, they were used to create interaction terms that highlight how context moderates the relationships between practices and student outcomes. Together, all of the measures derived from the survey can be grouped into three categories: classroom context; school context; and instructional practices, and each is explained in more detail in this section.

Classroom Context

Measures of classroom context were pulled directly from survey questions or extant student data and are used in the analyses to account for differences in classrooms that may be related to both teachers’ use of instructional practices and student outcomes. Table B.2 highlights the construct of interest and how it was operationalized in this study.

Table B.2. Measures of Classroom Context

| Measures of School and Classroom Context Included in Models | | Survey items |
|---|---------------------|---|
| Use of Curriculum | Intended Curriculum | Literacy Facilitator-reported use of: 1. CMS planning resources (Scope & Sequence, Reading/Writing Units of Study) 2. CMS curricular resources (Making Meaning, Words Their Way) 3. Other commercial resources |
| | Enacted Curriculum | Teacher-reported use, relative to Literacy Facilitator, of: 1. CMS planning resources (Scope & Sequence, Reading/Writing Units of Study) 2. CMS curricular resources (Making Meaning, Words Their Way) 3. Other commercial resources |

The first domain included was use of curriculum. In an earlier phase of this project, CMS collected information from every Literacy Facilitator about the use of curricular resources for Tier I ELA instruction in every grade. These curricular resources were grouped into three categories: CMS-endorsed materials for planning instruction (the Scope & Sequence, Reading Units of Study, and Writing Units of Study); CMS-endorsed curricular materials (Making Meaning, Words Their Way); and all other commercial curricular materials. For each of these categories, the team created two variables: the Literacy Facilitator’s report of the intended use of the resource in each grade, and then each teacher’s reported use relative to the frequency reported by their Literacy Facilitator.

Other constructs used as controls for the analysis include the beginning-of-year student performance, time spent on social studies and science instruction, and teacher years of experience.

Measures of School Context

Measures of school context were derived to be used not only as controls in regression analyses, but also as predictors to explain variation in the association between instructional practices and student outcomes. Because there were so many individual survey items, we reduced dimensionality by creating composite indices. These indices were created from the set of survey items related to school context. The research team ran a principal components analysis (PCA) on these items with a varimax rotation, which yielded four distinct components. Within each component teachers' responses to constituent survey items were assigned values of 1 through 4 to correspond to the four response options available, and responses across items were averaged to create the teacher's value for the index. Table B.3 provides the survey items contributing to each index.

Table B.3. School Context Indices

| Measures of School Context Included in Models | | Survey Items |
|---|------------------------------------|---|
| School Context | Perceived Teacher Community | <ol style="list-style-type: none"> 1. Teachers in this school trust each other 2. It's ok in this school to discuss feelings, worries, and frustrations with other teachers 3. Teachers respect other teachers who take the lead in school improvement efforts 4. Teachers feel respected by other teachers |
| | Perceived School Rigor | <ol style="list-style-type: none"> 1. The curriculum we are expected to teach is rigorous 2. The curriculum we are expected to teach is coherent 3. A student that transferred from my classroom to another district with a challenging assortment of courses would be well prepared for them 4. The curriculum at my school is oriented towards test preparation 5. School and district leaders have prepared me well to teach my school's curriculum |
| | Perceived Programmitis | <ol style="list-style-type: none"> 1. Many special programs come and go at this school 2. Once we start a new program, we follow up to make sure that it's working 3. Curriculum, instruction, and learning materials are well-coordinated across the different grade levels at this school. 4. We have so many different programs in this school that I can't keep track of them all. 5. There is consistency in curriculum, instruction and learning materials among teachers in the same grade level at this school |

| | | |
|--|-----------------------|---|
| | School Loyalty | <ol style="list-style-type: none"> 1. I wouldn't want to work at any other school 2. I would recommend this school to parents seeking a place for their child 3. I usually look forward to each working day at this school 4. I feel loyal to this school 5. Overall my school is a good place to work and learn 6. Students at this school follow rules of conduct 7. Parents/guardians support teachers, contributing to their success with students |
|--|-----------------------|---|

Measures of Instructional Practices

As with school context, there were sufficient individual survey questions about teacher instructional practices to merit dimensionality reduction. Two distinct groups of items were used to create these indices: the first set of items are aligned with the ECLS-1999 national survey and ask about foundational ELA practices most appropriate for students in younger grades; these items were only asked of Kindergarten, Grade 1, and Grade 2 teachers. The second set of items ask more complex instructional practices aligned with Common Core State Standards; the majority of these items are aligned with the ECLS-2010 national survey and were. As before, PCA with varimax was used to identify composite indices. Then, item loadings were used to create weighted averages of items within each of the composites.⁴ Unlike the questions which were asked on a Likert scale, these questions asked respondents to choose a range representing the frequency with which they provided each type of instruction, and responses were recorded as the midpoint of each possible range. Items associated with each index are provided in Table B.4

Table B.4. Key Components of Teachers' ELA Instruction

| | | |
|---------------------------------------|-------------------------------|--|
| Key Components of ELA Instruction | | Survey Items: For this school year as a whole, please indicate how often each of the following READING and LANGUAGE ARTS skills is taught in your class or classes. |
| K-2 Foundational ELA Practices | Phonics and print conventions | <ol style="list-style-type: none"> 1. Conventions of print (left to right orientation, book holding) 2. Alphabet and letter recognition 3. Matching letters to sounds 4. Writing own name (first and last) |

⁴ While most indices used the PCA results to develop item weights, the CCSS Comprehension index and the CCSS Academic Language index were created as unweighted averages of their constituent items.

| | | |
|---|------------------------------------|---|
| | Phonemic awareness | <ol style="list-style-type: none"> 1. Verbally manipulating syllables within a word (e.g., what is cowboy without cow?) 2. Reading multi-syllable words, like adventure 3. Common prepositions such as over and under, up and down |
| | Comprehension strategies | <ol style="list-style-type: none"> 1. Identifying the main idea and parts of a story 2. Making predictions based on text 3. Using context clues for comprehension |
| | Writing activities | <ol style="list-style-type: none"> 1. Remembering and following directions that include a series of actions 2. Using capitalization and punctuation 3. Composing and writing complete sentences 4. Composing and writing stories with an understandable beginning, middle, and end 5. Conventional spelling |
| Grade 3 Common- Core Aligned ELA Practices | Phonics and phonological awareness | <ol style="list-style-type: none"> 1. Segmenting words into phonemes 2. Manipulating phonemes to form new words 3. Distinguishing long and short vowels in one-syllable words 4. Decoding regularly spelled two-syllable words 5. Reading irregularly spelled words |
| | Fluency | <ol style="list-style-type: none"> 1. Identifying and knowing the meaning of common prefixes or suffixes 2. Reading accurately and fluently to support comprehension 3. Reading and rereading passages orally with guidance on pacing, intonation, and expression 4. Using sentence-level context to gain meaning of a word or phrase |
| | Writing | <ol style="list-style-type: none"> 1. Writing an opinion piece, giving reasons for the opinion 2. Writing an informational piece that contains a clear topic with supporting details 3. Writing a narrative with two or more appropriately sequenced events 4. Using temporal words or phrases to signal the order of events |

| | | |
|--|--------------------------|--|
| | <p>Comprehension</p> | <ol style="list-style-type: none"> 1. Identifying main ideas in fictional text 2. Asking and/or answering questions to demonstrate understanding of key details in a text 3. Retelling stories, including main ideas and details 4. Identifying the central message, lesson, or moral of a folktale or fable 5. Describing how characters in a story respond to major events and challenges 6. Identifying the main topic of a paragraph of informational text 7. Describing how words and phrases give rhythm and /or meaning in a story, poem, or song 8. Describing the overall structure of a story, for example how the beginning introduces the story or how the ending concludes the action 9. Identifying differences in the points of view of characters in a story 10. Using text features to locate key facts or information 11. Distinguishing their own point of view from that of the narrator, a character, or the writer. 12. Using information gained from illustrations of text to demonstrate understanding of a story’s characters, setting, or plot 13. Comparing and contrasting two versions of the same story by different authors or from different cultures 14. Explaining how images clarify informational text 15. Identifying the reasons an author gives to support points in an opinion piece 16. Identifying character, setting, and plot 17. Generating questions about character, setting, and plot 18. Predicting what might occur next in the text |
| | <p>Academic Language</p> | <ol style="list-style-type: none"> 1. Developing inferential language skills by discussing topics beyond the here and now 2. Developing narrative language skills by helping children clearly relate a series of events 3. Developing academic vocabulary knowledge by teaching children to comprehend and use words common to formal writing |

Model Specification

The analyses described in Sections III and IV of this report are estimated using two primary model specifications. For the main effects of practices on students, we fit the following student-level equation:

$$y_{ijk} = \alpha S_{ijk} + \gamma P_{jk} + \delta T_{jk} + \beta C_{jk} + \epsilon_{ijk}$$

Where the outcome of interest, y_{ijk} , is test score for student i taught by teacher j in school k . The equation includes the following other terms:

- S_{ijk} is a vector of individual student characteristics including: beginning-of-year test score on the outcome of interest;⁵ student demographics such as gender, race/ethnicity, and status as an English language learner; and participation in Special Education services
- T_{jk} is a vector of classroom and school characteristics including: teacher years of experience, time spent on science and social studies instruction, time spent in small group instruction for ELA, average classroom baseline performance, variation in classroom baseline performance, teacher- and literacy facilitator-reported use of specific curricular materials
- C_{jk} is a vector of school context indices: teacher community, perceived school rigor, programitis, and school loyalty.
- P_{jk} is a vector of instructional practices being investigated; in Section III these are the Foundational ELA Indices, and in Section IV these are the Common Core-aligned indices.

In the main effects models, the coefficients on P_{jk} , γ , is the coefficient of interest. All practice indices were included concurrently in the model to account for the correlation in different practices within teachers. Additionally, standard errors were clustered at the teacher-level to account for the correlation in outcomes for students within the same classroom.

The model for investigating variation in the association of practices and student outcomes is similar, but includes an interaction term between practices and measures of school context:

$$y_{ijk} = \alpha S_{ijk} + \gamma P_{jk} + \delta T_{jk} + \beta C_{jk} + \xi M_{jk} P_{jk} + \epsilon_{ijk}$$

Where all terms are defined as above, and M_{jk} is a single contextual variable of interest that is also included in vector T_{jk} . Thus, our vector of coefficients on this interaction term, ξ , tells us how the relationship between practices and outcomes varies according to a moderating variable. While all practice indices are included, only one moderating variable is analyzed at a time.

All models are fit separately for each grade.

⁵ For EOG scores, beginning-of-year MAP scores were used as a baseline control.

Appendix C: Regression Results from K-2 Sample

Table C.1. Main Effects of Foundational ELA Practices on K-2 Student Outcomes

| | Effect on MCLASS Scores | Effect on MAP Scores |
|--|----------------------------|-------------------------|
| <u>Panel A: Kindergarten</u> | | |
| Phonics & print conventions | 4.064 (6.663) | 2.719~ (1.568) |
| Phonemic awareness | -1.308 (5.307) | -2.889 (1.802) |
| Comprehension | 6.797 (6.883) | -1.004 (1.455) |
| Writing activities | 9.886 (9.303) | 3.625 (2.508) |
| Student covariates | Y | Y |
| Classroom instructional context covariates | Y | Y |
| School context covariates | Y | Y |
| Sample Size | 1,998 | 1024 |
| <u>Panel B: First Grade</u> | | |
| Phonics & print conventions | 2.227 (8.040) | -1.860 (1.235) |
| Phonemic awareness | 1.553 (9.948) | 2.586* (1.209) |
| Comprehension | -10.165 (7.392) | -1.799 (1.263) |
| Writing activities | 28.239 (19.345) | 0.557 (2.397) |
| Student covariates | Y | Y |
| Classroom instructional context covariates | Y | Y |
| School context covariates | Y | Y |
| Sample Size | 2223 | 1952 |
| <u>Panel C: Second Grade</u> | | |
| Phonics & print conventions | 4.047 (15.949) | 3.519** (1.256) |
| Phonemic awareness | -15.699 (13.087) | -0.065 (1.070) |
| Comprehension | 14.643 (11.721) | 1.527 (1.163) |
| Writing activities | 12.851 (11.003) | 0.141 (1.094) |
| Student covariates | Y | Y |
| Classroom instructional context covariates | Y | Y |
| School context covariates | Y | Y |
| Sample Size | 2265 | 2169 |

Table C.2. Differential Effects of Foundational ELA Practices by Title I Status of Schools

| | <u>Kindergarten</u> | | <u>First Grade</u> | | <u>Second Grade</u> | |
|--|---------------------|-------------------|---------------------|--------------------|----------------------|--------------------|
| | MCLASS Scores | MAP Scores | MCLASS Scores | MAP Scores | MCLASS Scores | MAP Scores |
| Phonics & print conventions | 0.555 (8.888) | 1.852 (1.705) | -4.875 (10.839) | 0.103 (1.393) | 49.038~ (26.388) | 4.579** (1.667) |
| Phonemic awareness | -1.391 (6.876) | -2.602 (2.305) | 10.763 (10.584) | 2.628~ (1.455) | -36.530* (15.290) | -0.245 (1.504) |
| Comprehension | 0.140 (8.106) | -1.954 (1.688) | -14.180 (8.728) | -1.819 (1.344) | 12.495 (13.700) | 1.106 (1.470) |
| Writing activities | 15.528 (11.779) | 0.428 (2.615) | 15.261 (16.843) | -0.136 (3.178) | 19.287 (12.767) | 1.059 (1.386) |
| Title I * Phonics & print conventions | 15.026 (12.638) | 4.036 (5.301) | 25.749~ (14.415) | -4.818* (2.019) | -75.031* (31.550) | -1.898 (2.140) |
| Title I * Phonemic awareness | -1.957 (10.371) | -0.185 (4.071) | -36.714 (22.468) | 0.621 (2.544) | 41.889 (30.498) | 0.495 (2.169) |
| Title I * Comprehension | 21.062 (13.676) | 2.149 (4.722) | 17.375 (13.358) | -0.389 (2.596) | 5.360 (23.875) | 1.415 (2.353) |
| Title I * Writing activities | -17.144 (17.887) | 8.317~ (4.818) | 37.464 (47.371) | 2.313 (3.953) | -17.281 (20.243) | -2.370 (2.280) |
| Student covariates | Y | Y | Y | Y | Y | Y |
| Classroom instructional context covariates | Y | Y | Y | Y | Y | Y |
| School context covariates | Y | Y | Y | Y | Y | Y |
| Sample Size | 1,998 | 1,024 | 2,223 | 1,952 | 2,265 | 2,169 |

Table C.3. Differential Effects of Writing Activities on Kindergarten MAP Scores by Teacher-Reported Measures of School Context

| | Model (1) | Model (2) | Model (3) | Model (4) |
|---|----------------------|-----------------------|---------------------|--------------------|
| Writing activities | -21.963~ (12.496) | -35.197** (13.236) | -28.903 (24.733) | -5.220 (15.302) |
| Perceived teacher community * Writing activities | 8.373* (3.712) | | | |
| Perceived school rigor * Writing activities | | 12.248** (4.397) | | |
| Perceived programmitis * Writing activities | | | 11.239 (8.861) | |
| School loyalty * Writing activities | | | | 2.898 (4.884) |
| Student covariates | Y | Y | Y | Y |
| Classroom instructional context covariates | Y | Y | Y | Y |
| School context covariates | Y | Y | Y | Y |
| Main effects for other foundational ELA practices | Y | Y | Y | Y |
| Interactions between perceived teacher community and other foundational ELA practices | Y | | | |
| Interactions between perceived school community and other foundational ELA practices | | Y | | |
| Interactions between perceived programmitis and other foundational ELA practices | | | Y | |
| Interactions between school loyalty and other foundational ELA practices | | | | Y |
| Sample Size | 1,024 | 1,024 | 1,024 | 1,024 |

Table C.4. Differential Effects of Writing Activities on First Grade MAP Scores by Teacher-Reported Measures of School Context

| | Model (1) | Model (2) | Model (3) | Model (4) |
|---|--------------------|-------------------|--------------------|--------------------|
| Writing activities | 20.002 (12.157) | 7.196 (9.530) | -6.753 (13.646) | 11.514 (11.536) |
| Perceived teacher community * Writing activities | -5.766~ (3.354) | | | |
| Perceived school rigor * Writing activities | | -2.620 (2.635) | | |
| Perceived programitis * Writing activities | | | 2.262 (4.552) | |
| School loyalty * Writing activities | | | | -3.501 (3.181) |
| Student covariates | Y | Y | Y | Y |
| Classroom instructional context covariates | Y | Y | Y | Y |
| School context covariates | Y | Y | Y | Y |
| Main effects for other foundational ELA practices | Y | Y | Y | Y |
| Interactions between perceived teacher community and other foundational ELA practices | Y | | | |
| Interactions between perceived school community and other foundational ELA practices | | Y | | |
| Interactions between perceived programitis and other foundational ELA practices | | | Y | |
| Interactions between school loyalty and other foundational ELA practices | | | | Y |
| Sample Size | 1,952 | 1,952 | 1,952 | 1,952 |

Table C.5. Differential Effects of Writing Activities on Second Grade MAP Scores by Teacher-Reported Measures of School Context

| | Model (1) | Model (2) | Model (3) | Model (4) |
|---|--------------------|-------------------|--------------------|-------------------|
| Writing activities | 4.670 (2.851) | 3.206 (5.057) | 19.118* (8.312) | 3.763 (3.548) |
| Perceived teacher community * Writing activities | -1.467~ (0.857) | | | |
| Perceived school rigor * Writing activities | | -0.943 (1.517) | | |
| Perceived programitis * Writing activities | | | -7.029* (3.020) | |
| School loyalty * Writing activities | | | | -1.167 (1.099) |
| Student covariates | Y | Y | Y | Y |
| Classroom instructional context covariates | Y | Y | Y | Y |
| School context covariates | Y | Y | Y | Y |
| Main effects for other foundational ELA practices | Y | Y | Y | Y |
| Interactions between perceived teacher community and other foundational ELA practices | Y | | | |
| Interactions between perceived school community and other foundational ELA practices | | Y | | |
| Interactions between perceived programitis and other foundational ELA practices | | | Y | |
| Interactions between school loyalty and other foundational ELA practices | | | | Y |
| Sample Size | 2,169 | 2,169 | 2,169 | 2,169 |

Appendix D - Regression Results from Grade 3 Sample

Table D.1. Main Effects of Common Core-Aligned ELA Practices on Grade 3 Student Outcomes

| | Effect on MCLASS Scores | Effect on MAP Scores | Effect on EOG Scores |
|--|-------------------------------|----------------------------|----------------------------|
| Phonological awareness | -19.418 (18.938) | -0.639 (1.481) | 0.266 (0.944) |
| Fluency | -29.694 (19.411) | -1.764 (1.493) | 0.009 (0.907) |
| Academic language | -13.640 (15.757) | -1.856 (1.509) | 0.141 (1.000) |
| Writing activities | 56.409* (27.573) | -3.592* (1.769) | -1.040 (1.410) |
| Comprehension | 5.905 (23.115) | 4.458* (1.846) | 0.520 (1.206) |
| Student covariates | Y | Y | Y |
| Classroom instructional context covariates | Y | Y | Y |
| School context covariates | Y | Y | Y |
| Sample Size | 1,987 | 1,980 | 1,980 |

Table D.2. Differential Effects of Common Core-Aligned ELA Practices on Grade 3 Outcomes by Title I Status

| | Effect on MCLASS Scores | Effect on MAP Scores | Effect on EOG Scores |
|--|-------------------------------|----------------------------|----------------------------|
| Academic Language | -44.511~ (23.267) | -1.547 (1.436) | 0.531 (1.076) |
| Phonological awareness | -10.653 (22.747) | -0.877 (1.927) | 1.644 (1.572) |
| Fluency | -14.642 (17.804) | -3.629* (1.703) | 0.318 (1.183) |
| Writing activities | 20.239 (37.677) | -3.324~ (1.984) | -2.919 (1.825) |
| Comprehension | 4.495 (29.368) | 3.915* (1.830) | -1.008 (1.401) |
| Title I * Academic Language | 71.438* (31.148) | 0.912 (2.882) | -0.581 (1.874) |
| Title I * Phonological awareness | -11.795 (27.983) | -1.087 (3.975) | -1.984 (2.517) |
| Title I * Fluency | -21.771 (37.745) | 7.660* (3.636) | -0.771 (2.564) |
| Title I * Writing activities | 99.532* (42.481) | -2.518 (4.802) | 2.400 (2.696) |
| Title I * Comprehension | -30.162 (41.436) | 1.596 (5.409) | 3.823 (3.005) |
| Student covariates | Y | Y | Y |
| Classroom instructional context covariates | Y | Y | Y |
| School context covariates | Y | Y | Y |
| Sample Size | 1,987 | 1,980 | 1,980 |

Table D.3. Differential Effects of Common Core-Aligned ELA Practices on Grade 3 Outcomes by Differences in Teacher Community

| | Effect on MCLASS Scores | Effect on MAP Scores | Effect on EOG Scores |
|--|-------------------------------|----------------------------|----------------------------|
| Academic Language | 67.235 (68.815) | 0.757 (6.357) | -1.334 (3.481) |
| Phonological awareness | -24.355 (80.720) | -8.697 (8.120) | -3.922 (4.886) |
| Fluency | 5.604 (70.865) | 0.003 (5.890) | 0.049 (4.353) |
| Writing activities | -30.376 (92.292) | -23.961*** (6.367) | -12.182** (3.934) |
| Comprehension | -135.300 (86.514) | 17.487~ (9.682) | 13.331** (4.539) |
| Teacher Community * Academic Language | -27.923 (22.539) | -0.524 (1.912) | 0.465 (1.065) |
| Teacher Community * Phonological awareness | -1.930 (28.329) | 1.967 (2.562) | 1.135 (1.455) |
| Teacher Community * Fluency | -5.997 (20.879) | -0.509 (1.798) | 0.062 (1.325) |
| Teacher Community * Writing activities | 27.285 (30.575) | 6.878** (2.157) | 3.797** (1.264) |
| Teacher Community * Comprehension | 44.098 (28.210) | -4.195 (3.014) | -4.070** (1.419) |
| Student covariates | Y | Y | Y |
| Classroom instructional context covariates | Y | Y | Y |
| School context covariates | Y | Y | Y |
| Sample Size | 1,987 | 1,980 | 1,980 |

Table D.4. Effects of Curricular Use Overall and by Title I Status, for Whole-District Sample

| | Main Effects | | | Title I Interactions | | |
|---|--------------------|---------------------|-------------------|----------------------|---------------------|---------------------|
| | MCLASS Scores | MAP Scores | EOG Scores | MCLASS Scores | MAP Scores | EOG Scores |
| Use of CMS Planning Resources | -0.576 (4.455) | -3.173 (6.091) | -0.244 (0.419) | -1.257* (0.576) | -1.377** (0.526) | -2.578** (0.918) |
| Use of CMS Curricular Resources | -5.672 (4.779) | -0.804 (6.398) | 0.557 (0.451) | 0.537 (0.540) | 0.401 (0.328) | -0.233 (0.521) |
| Use of Other Commercial Resources | -7.422 (24.760) | 5.241 (36.721) | -0.819 (2.394) | -0.728 (3.634) | -6.078* (2.400) | -2.422 (2.817) |
| Title I * Use of CMS Planning Resources | | 6.000 (8.847) | | 2.053* (0.808) | | 2.317* (0.952) |
| Title I * Use of CMS Curricular Resources | | -11.895 (9.099) | | -0.063 (0.888) | | 0.959 (0.690) |
| Title I * Use of Other Commercial Resources | | -27.467 (47.963) | | -0.056 (4.819) | | -5.136 (4.384) |
| Student covariates | Y | Y | Y | Y | Y | Y |
| School context covariates | Title I | Title I | Title I | Title I | Title I | Title I |
| Sample Size | 10,379 | 10,379 | 10,690 | 10,690 | 10,798 | 10,798 |