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The Role of Home Literacy Practices in Kindergarten Children's Early Writing Development: A One-Year Longitudinal Study

Ying Guo^a, Cynthia Puranik^b, Ben Kelcey^a, Jing Sun^a, Megan Schneider Dinnesen^a, and Allison Breit-Smith^a

^aSchool of Education, University of Cincinnati; ^bDepartment of Communication Sciences and Disorders, Georgia State University

ABSTRACT

Research Findings: Home literacy practices are an important variable in the development of literacy skills among children. However, several questions regarding the relationship between home literacy practices and writing are unanswered. The objective of this correlational study is to examine the relationship between reading-related and writing-related home practices and children's writing development. Participants included 282 kindergarten children and their parents in the South and Midwest United States. Each child completed an identical battery of direct writing assessments in the fall and the spring of kindergarten. Information concerning home literacy practices was obtained through a questionnaire completed by parents during the fall of kindergarten. Multilevel model analyses were conducted. Three major findings are reported: (1) independent reading significantly predicted children's fall letter writing, spelling, and composition skills as well as their spring spelling skills after controlling for their fall skills and family SES, (2) independent writing significantly predicted children's fall letter writing and spelling skills after controlling for family SES, and (3) the other home practices did not contribute to any fall or spring writing outcome. *Practice for policy:* These findings highlight the importance of independent practices related to reading and writing at home in improving children's writing.

Research has indicated that children's early writing skills in kindergarten are associated with later writing achievement (Kent et al., 2014; Kim et al., 2015). Specifying where and how kindergarten children acquire these writing skills is important for developing appropriate curricula or interventions. There is consensus among researchers, policymakers, and practitioners that home literacy practices are likely to enhance the development of reading, oral language, and writing (Burgess et al., 2002; C. S. Puranik et al., 2018; Sénéchal & LeFevre, 2002; Sénéchal et al., 1998). Home literacy practices refer to the types of literacy-oriented activities that occur in the home and include reading-related practices (e.g., parent-child joint book reading, parental teaching about letter names) and writing-related practices (e.g., parent-child joint writing activities, parental teaching about writing names or other words; Griffin & Morrison, 1997; Sénéchal et al., 1998). Despite the consensus that home literacy practices are important in the development of reading, oral language, and writing skills, little research has focused on both reading-related and writing-related home practices and their differential effects on children's writing skills. In fact, given the functional view of reading-writing connections (Fitzgerald & Shanahan, 2000), reading-related home practices should facilitate children's writing development. An understanding of the role of reading-related home practices in improving children's writing skills could offer valuable information regarding reading-writing connections and has implications for future intervention efforts. Accordingly, in the present study,

CONTACT Ying Guo  guoy3@ucmail.uc.edu  School of Education, University of Cincinnati, 260 Teacher-Dyer Complex, 2610 McMicken Cir, Cincinnati, OH 45221

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we extend prior work by examining the role of both reading-related and writing-related home practices in kindergarten children's writing development in a one-year longitudinal study. Our study may have implications for teachers to support families with suggestions of evidence-based reading and writing practices at home that may facilitate early writing development.

Conceptualizing Home Literacy Practices

Home literacy practices have been conceptualized as an umbrella concept that encapsulates all types of literacy-orientated experiences that are interlinked but may impact different developmental outcomes (Phillips & Lonigan, 2009; Scarborough & Dobrich, 1994; Sénéchal & LeFevre, 2002). Literacy skills include reading and writing. Reading and writing are “two buckets drawing water from a common well or two buildings built on a common foundation” (Shanahan, 2006, p. 195) and thus reading and writing co-develop and influence each other (Fitzgerald & Shanahan, 2000). As such, home literacy practices are better defined as encompassing both reading-related and writing-related home practices. However, much of the research to date concerning home literacy practices have focused on reading-related home practices and how these activities impact children's reading skills. Research shows, however, that parents engage with their children in writing-related practices as well (Haney & Hill, 2004; Hindman & Morrison, 2012; Levy et al., 2006). Furthermore, there is emerging evidence that these writing-related home practices directly contribute to children's emergent writing skills (D. Aram & Levin, 2001; C. S. Puranik et al., 2018; Skibbe et al., 2013). Several research studies have broadened the conceptualization of home literacy practices by including writing-related practices such as direct parental teaching of writing and children's independent writing practices (Haney & Hill, 2004; Hindman & Morrison, 2012; C. S. Puranik et al., 2018; Sénéchal et al., 1998).

For both reading-related and writing-related practices, home practices represent the way in which and frequency with which children engage with literacy activities alongside others (e.g., parents) and on their own (Teale & Sulzby, 1986; Van Steensel, 2006). Sénéchal and her colleagues (Sénéchal & LeFevre, 2002; Sénéchal et al., 1998) proposed that there are two specific aspects of parent-led literacy practices at home: formal and informal literacy activities. Formal literacy activities include explicit interactions with print and often include parents' attempts to directly teach their children literacy skills. Examples include direct parental teaching of letters or reading and writing of words. In contrast, informal literacy activities are those that expose children to print concepts incidentally through activities (e.g., parent-child joint book reading). During these informal activities, parents focus on the meaning of the story rather than directly teaching vocabulary words or letters during parent-child reading interactions. In addition to formal and informal parent-led activities, experiences in which children independently explore literacy (e.g., independent reading and writing) is also a salient aspect of home literacy practices (Teale & Sulzby, 1986). Research has demonstrated that both parent-led activities and child independent activities are consistently associated with improvement in reading, oral language, and writing skills (e.g., Evans et al., 2000; Foy & Mann, 2003; Roth et al., 2002; C. S. Puranik et al., 2018).

In the present study, we used a richer, more diverse home literacy practices construct by including both reading-related and writing-related home practices. Within the reading-related home practices, we examined formal activities (parents' teaching reading), informal activities (parent-child joint reading), and children's independent reading practices. Within the writing-related home practices, we investigated formal activities (parents' teaching writing) and children's independent writing practices.

Reading-Related Home Practices and Children's Writing Skills

Formal reading experiences, such as the frequency with which parents report directly teaching their child to read words, have been studied in relation to children's literacy development. A body of research has demonstrated significant and positive relations between parental teaching of reading

skills and children's code-related reading skills including print knowledge, phonological awareness, and letter knowledge, as well as word reading (Evans et al., 2000; Levy et al., 2006; Sénéchal & LeFevre, 2002; Stephenson et al., 2008). Few studies however, have examined the role of formal reading practices to children's writing-related skills. Gerde et al. (2012) found that home literacy practices, including the frequency with which parents teach children reading and writing skills, explained about 2% of the variance in name writing. Tichnor-Wagner et al. (2016) investigated the relationship between home literacy practices and reading and spelling performance among kindergarten and first-grade students in a rural school setting. Their findings indicated that parents' explicit teaching of reading skills, parent-child joint book reading and access to literacy materials were all positively related to children's spelling skills. Last, Hood et al. (2008) conducted a three-year longitudinal study in which they examined preschool home literacy practices (parent-child reading and parental teaching of letters, words, and name writing) and children's reading and spelling development. Their results demonstrated that parental teaching during the preschool years was directly related to spelling rate in Grades 1 and 2, accounting for 5.3% of the variance in Grade 1 spelling rate and 6.4% of the variance in Grade 2 spelling rate. Of particular importance, their findings underscored the longitudinal effects of home literacy practices on children's writing development.

In contrast, informal reading experiences have little effect on code-related reading skills such as phonological awareness and print knowledge (Burgess et al., 2002; Hood et al., 2008; Kim, 2009; Sénéchal, 2006), unless parent-child interactions during book reading are manipulated to include explicit code-focused teaching (Justice & Ezell, 2000). Rather, research studies have demonstrated that informal reading experiences (i.e., frequency of parent-child joint reading) positively contribute to children's oral language skills (Burgess et al., 2002; Scarborough & Dobrich, 1994). Although very few studies have examined outcomes of informal home reading experiences related to children's writing skills, two studies, in particular, have included measures of children's writing (Bingham & Mason, 2018; Kim, 2009). Kim (2009) investigated how home literacy practices were related to developmental trajectories of children's emergent literacy and conventional literacy skills including spelling skills in Korean-speaking preschool children. This study found that home reading, including the frequency of parent-child joint reading, was not related to spelling skills. Similarly, Bingham and Mason (2018) found that book sharing in the home (e.g., parent-child joint reading, maternal book reading strategies) was not associated with preschoolers' name writing and invented spelling. Thus, there is little evidence that informal home literacy practices are related to the writing skills of preschool-age children; however given that our study includes kindergarten children, it is still unclear in the research base whether the frequency of parent-child joint reading is related to kindergarten children's writing skills and subsequently this question is worth exploring.

In addition to studying the frequency of parent-led reading activities, other research has focused on children's independent reading practices (Frijters et al., 2000; Payne et al., 1994; Sawyer et al., 2014; Sénéchal et al., 1996). However, findings about the importance of independent reading are mixed. No significant relation between children's independent reading and vocabulary development was noted in two studies (Payne et al., 1994; Sénéchal et al., 1996). In contrast, Sawyer et al. (2014) examined the frequency of home reading and defined three features: parent-child joint reading, child-initiated reading, and independent reading. They reported that the frequency of home reading activities contributed unique variance to letter knowledge, print concepts, and name writing in preschool children with language impairment. These findings provide partial support for the importance of independent reading in children's reading and writing skills.

Writing-Related Home Practices and Children's Writing Skills

The existing evidence suggests that practices in the home, including writing-related activities such as parents' explicit teaching of writing skills as well as children's independent practice of writing names or words, appear to benefit children (Hindman & Morrison, 2012; Levy et al., 2006; Neumann et al., 2009;

C. S. Puranik et al., 2018). Parents' teaching of writing includes practicing writing letters, names, and words with children, enunciating the sounds in words, dictating letters as children write a letter, encouraging children to copy letters or words from their environment, and involving children in writing notes or birthday cards (Burns & Casbergue, 1992; Hindman & Morrison, 2012; Neumann et al., 2009; C. S. Puranik et al., 2018). Parent reports of the frequency of their writing teaching have been gathered in parent surveys. (Hindman & Morrison, 2012; Levy et al., 2006; C. S. Puranik et al., 2018; Sénéchal et al., 1998). With the exception of one recent study (C. S. Puranik et al., 2018), parent survey research has not directly examined the relations between writing-related home practices and children's writing-related skills. C. S. Puranik et al. (2018) demonstrated that parental teaching of writing (e.g., parents' helping children with writing letters and writing names) significantly predicted preschool children's letter writing, spelling, and spontaneous writing after controlling for their cognitive skills and maternal education.

In addition to survey data, studies that have employed direct observation of parent-child interaction during writing activities also supported the importance of parental writing support in improving children's writing skills. In these studies, parent-child interactions were videotaped during a joint writing activity (e.g., writing an invitation or a grocery list) and parental support for children's writing was coded. Burns and Casbergue (1992) reported that children produced more conventional writing output when parents provided more directive instruction in a joint writing activity. Other studies have used a comprehensive battery to assess children's reading and writing skills and suggested that parental writing support improved both children's reading and writing skills (Aram, 2010; D. Aram & Levin, 2001, 2002, 2004; Lin et al., 2009; Skibbe et al., 2013). For example, D. Aram and Levin (2001) found that the quality of mothers' support (e.g., helping the child writing letters, helping the child break a word into sounds) during the writing process was associated with better word writing, word recognition, and phonological awareness skills in Hebrew-speaking kindergarten children. Furthermore, findings from other work support the longitudinal relations between parents' writing support during the preschool and kindergarten years and children's spelling, word reading, and reading comprehension as late as the end of second grade (Aram, 2010; D. Aram & Levin, 2002, 2004; Levin et al., 2013).

Another potential factor that has received empirical attention is a child's independent writing practice (D. Aram & Levin, 2001; C. S. Puranik et al., 2018; Skibbe et al., 2013). In their study, Skibbe et al. (2013) noted that parents tend to allow more autonomy during the joint writing activity as children show more independence. D. Aram and Levin (2001) showed a significant positive correlation between the level of child autonomy during the writing task and children's word writing and recognition. Further, one recent study found that children's independent writing practices (e.g., the frequency of child working alone on writing letters) accounted for about 6% of the variance in preschool children's letter writing and 4% of the variance in their spontaneous writing (C. S. Puranik et al., 2018). Collectively, these studies indicate that as children's literacy skills increase, they are more likely to request less help from their parents and be involved in independent writing practices, which are beneficial for their reading and writing development.

Early Writing Development in Kindergarten Children

Theoretical frameworks and research studies support the view of writing development as a multidimensional construct. Specifically, theoretical views of writing show that for developing writers, writing involves two separate but related sub-components: *transcription* (i.e., translating language into text) and *text generation* (i.e., translating ideas into written language; Berninger & Winn, 2006; Juel et al., 1986). As applied to kindergarten children, transcription consists primarily of handwriting and spelling processes and text generation includes composition. Handwriting refers to the accuracy and rate of writing letters, and is typically assessed by asking children to write alphabet letters accurately (Kim et al., 2011; Puranik & Al Otaiba, 2012). Different from handwriting, spelling is a product of multiple skills including letter-sound correspondence knowledge, phonological awareness, and morphological awareness (Apel & Masterson, 2001). Composition refers to children's

emerging ability to generate their ideas for what to write and compose phrases, sentences, or simple texts in their writing using conventional or invented spelling (Kim et al., 2011). Consistent with these research findings and theoretical frameworks, the *Common Core State Standards* specifies that by the end of kindergarten, children will: (a) print many upper- and lower-case letters, (b) write a letter or letters for most consonant and short-vowel sounds, (c) spell simple words phonetically, and (d) use a range of compositional methods including drawing, dictating, and writing to write about experiences, stories, people, objects, or events (National Governors Association, 2010). Therefore, based on theory, empirical evidence, and standards of practice, we focused our study on three important early writing outcomes: letter writing, spelling (at both the sound and word level), and composition.

The Present Study

Although previous studies have established the associations between home literacy practices and writing achievement, few studies have examined how home literacy practices during kindergarten are associated with writing development. Kindergarten is the first time many children receive general reading and writing instruction throughout the school day; therefore, kindergarten may be the first time the role of home literacy practices in improving children's writing skills is shared with or shaped by the school.

Research suggests that home literacy practices are strongly associated with the starting point of children's reading achievement, but are less associated with children's reading progress once children enter school (Aikens & Barbarin, 2008; Petrill et al., 2006). Therefore, we investigated the relationship between home literacy practices and children's writing skills measured at the beginning of kindergarten as well as at the end of kindergarten. Most children had experienced little schooling at the beginning of kindergarten, and 1 year of schooling at the end of kindergarten. As such, we can determine whether the effects of home literacy practices on writing development may change over the kindergarten year. In addition, research studies suggest that children's family socioeconomic status/SES, as indexed by maternal education and family income, explain variations in home literacy practices (e.g., Hartas, 2011; Neuman & Celano, 2001; Phillips & Lonigan, 2009). Parents of children from low-SES homes engage in fewer reading and writing activities and provide less support for their children's literacy development compared to middle-SES homes. Consequently, we used family SES as the covariate to control for any differences in children. In the present study, we sought to examine the relationship between home literacy practices and children's writing skills at the beginning and end of the kindergarten year after controlling for family SES. This study addressed two specific research questions:

- (a) To what extent do home literacy practices predict children's writing skills measured at the beginning of the kindergarten year?
- (b) To what extent do home literacy practices predict children's writing skills measured at the end of the kindergarten year?

Method

Participants

The present study was part of a large-scale project which investigated writing instruction and kindergarten children's writing development. The large-scale project featured three sequential and non-overlapping cohorts of teachers and children in the United States. A convenience sample was used; participants (e.g., parents and their children) were recruited through teachers who volunteered to participate in the study. Children were eligible to participate if (1) their primary home language

was English and (2) they had no profound sensory and cognitive difficulties or disabilities. Among consented children, six per classroom were randomly selected to participate in the study. Participants for this study included two cohorts of children who participated in the large study. In total, participants included 282 kindergarten children from 49 classrooms within 25 schools in the South and Midwest United States. Approximately 68% of classrooms were in suburban settings, with 32% in urban settings. An average classroom included 21 children ($SD = 3.8$; range = 6 to 26). Among participating children, 133 were boys and 149 were girls. The mean age of participating children was 5.2 years ($SD = .42$; range = 5–6 years). The sample's ethnic/racial composition included Caucasian (70%), African American (21%), Hispanic/Latino (1.5%), multiracial (6%), and Asian (1.5%). The educational attainment of children's mothers included 15% with a bachelor's degree, 13% with a master's degree, and 2% with a doctoral degree. Forty-one percent of children's families had an annual household income above 85,000 USD per year, 13% between 60,000 USD and 85,000 USD per year, 27% between 30,000 USD and 60,000 USD per year, and 19% less than 30,000 USD per year. The median household income in the United States in 2018 was 57,652 USD (U.S. Census Bureau, 2018), therefore approximately half of the families (54%) in the total sample were above the median US income.

Procedures and Measures

A 3-step procedure was used to recruit teachers and children in the large-scale study. First, the research team contacted local school districts to get permission to recruit teachers. Second, 10-min information sessions were provided to teachers who were teaching kindergarten children. Third, once teachers were consented, children in enrolled classrooms were recruited via parent consent. Only the data collected regarding children's home literacy practices and early writing skills are discussed in this study. At the beginning of the academic year, parents or legal guardians of participating children completed a comprehensive questionnaire on general demographic information of the children (e.g., family income, maternal education level) and home literacy practices. The return rate of the parent questionnaire was 97%. Children were individually assessed with a battery of writing assessments by trained research assistants at two time points: the first in fall (October) of kindergarten and the second in spring (May). These assessments took place in a quiet and distraction-free room at the children's schools. Research assistants were trained using protocols involving (a) a PowerPoint training module with a video demonstrating assessment administration, (b) a written quiz (90% accuracy was required on quiz questions), and (c) three supervised practice administrations (90% accuracy per practice on observer's checklist). The quiz included true/false and open-ended questions assessing research assistants' understanding of the administration and scoring of assessments and ceiling rules.

Home Literacy Questionnaire

Home literacy practices were assessed using a parent questionnaire which included questions about home literacy practices taken from previous research (C. S. Puranik et al., 2018; Whitehurst, 1992). These questions were utilized to obtain information regarding parental practices specific to reading and writing. Home practices specific to reading included teaching reading (the number of times parents taught their child about letters in a book and the number of times parents taught their child about words in a book), parent-child joint reading (the number of times a week parents participated in a joint book reading with their child), child-initiated reading (the number of times per week that the child asked to be read to), and independent reading (the number of times a week parents observed their child looking at books on their own). Questions that tapped reading-related practices were rated on a nine-point scale, ranging from zero times a week to more than eight times a week. Internal consistency for questions related to reading-related home practices was .65. Home practices specific to writing included teaching writing and independent writing. Questions that tapped teaching writing included "How often do you help your child with writing letters of the alphabet?"

“How often do you help your child learn to write his or her name, or other words?” “How often do you and your child do writing activities at the same time” and “How often do you involve your child in writing notes or birthday cards to members of your family?” Independent writing was captured with the following two questions: “How often does your child work alone on writing letters of the alphabet?” and “How often does your child attempt to write names of words independently?” These questions targeted writing-related practices and were rated on a six-point scale, ranging from never to every other day. Internal consistency for questions related to writing-related home practices was .62.

Child Family SES

Parents of each participating child were asked to complete questions on general demographic information. To document family income, parents were asked to select the scale of their annual family income from among 18 options (\$5,000 or less, 5,001 USD to 10,000, USD and so forth). This variable was included as a continuous scale in analyses. To document the level of education, mothers were asked to report their highest level of education by choosing from among 11 options. Level of education was recoded as a dichotomous variable (1 = mothers had a bachelor’s degree, 0 = mothers did not have a bachelor’s degree). Previous research suggests that family SES incorporates family income and parental education (Bollen, Glanville, & Stecklov, 2001). Moreover, one recent study supports diverse considerations, views and measures of SES by constructing a composite measure of SES (sum scores of different SES indicators; Darin-Mattsson et al., 2017). Thus, the scores of these two variables (i.e., family income, mothers’ level of education) were summed to create an SES composite. The SES composite in this study is a type of compensatory weighted composite such that having a high income or bachelor’s degree can to some extent compensate or overcome low values in the complementary indicator.

Child Letter Writing

For the letter writing tasks, children’s ability to write uppercase and lowercase alphabet letters was assessed. Children were asked to write each of the 26 uppercase and 26 lowercase letters in the alphabet. The examiner said a letter out loud in random order and the children were instructed to write the letter on primary-lined paper. Assessments were scored by two graduate research assistants (GRAs) who were extensively trained in the scoring protocol. Children received two points for each correct and well-formed letter; one point for a correct and recognizable, but poorly formed letter; and zero points for letters that were incorrect, blank, unrecognizable, or extremely poorly formed (i.e., a letter that was reversed and also had disproportionate parts). The maximum score was 52 for each of the two letter writing tasks. The GRAs scored each assessment independently and then compared scores. Average inter-rater reliability as measured by Cohen’s Kappa was .75. The average scores of uppercase and lowercase alphabet letter writing assessments were used to represent children’s letter writing.

Child Spelling

Measures of word spelling and sound spelling were used to represent children’s spelling skills. The Spelling subtest of the Woodcock–Johnson Tests of Achievement (WJ-IV; Shrank et al., 2014) was used to measure children’s word spelling skills. For this subtest, children were asked to write orally presented words, which increased in difficulty. Since the participants were kindergartners, the assessment started with initial items measuring prewriting skills such as drawing and tracing letters and writing upper- and lowercase letters. This subtest includes 60 items. Per the Examiner’s Manual, the assessment was stopped when the child had six consecutive incorrect responses. Responses were scored 1 as correct and 0 as incorrect as per test protocol. Scoring was not affected by letter reversal as long as it did not result in the formation of another letter (Mather & Wendling, 2014). The maximum score on this task was 60. For the statistical analysis, we converted raw scores to W scores which are “a special transformation of the Rasch ability scale” (Mather & Wendling, 2014, p. 79). Internal consistency reliability for the spelling task was .81 for the current sample.

The Spelling of Sound subtest of WJ-IV (Shrank et al., 2014) was used to measure children's sound spelling. For the early items, children were asked to write single letters of sounds. For the remaining items, children listened to the provided audio recording and then spelled letter combinations that consisted of regular patterns in English spelling. The items were non-words or low-frequency words. There were 30 items in total. Per the Examiner's Manual, the assessment was stopped when the child had six consecutive incorrect responses. Responses were scored 1 as correct and 0 as incorrect. Scoring was based on the most frequently occurring English spelling patterns and thus affected by how the child spelled the non-words (Mather & Wendling, 2014). The maximum score on this task was 30. *W* scores were used for data analysis. Internal consistency reliability for the Spelling of Sounds subtest was .85 for the present sample. The average *W* scores of the Spelling subtest and Spelling of Sounds subtest of WJ-IV were used to indicate children's spelling skills.

Child Composition

To assess children's composition skills, each child was asked to write two short essays in response to two prompts. For the first prompt, children were asked to write about a special event from their life. For the second prompt, children were asked to write about something they knew a lot about. For both prompts, children were given instructions by the examiner and then led through a short brainstorming session. Children were given 5 min for each of the two essays. The prompts were administered on different days to prevent fatigue. Similar to the letter writing task, children's essays were scored by two GRAs individually first and their scores were then compared. Discrepancies were resolved following discussion and a final agreed-upon score was entered. Children's compositions were coded for productivity, complexity, accuracy, and quality.

Writing productivity was the count of the number of words included in the essay. Words written is a frequently used indicator of productivity (Kim et al., 2015; C. S. Puranik et al., 2008; Wagner et al., 2011). Complexity and accuracy were coded using curriculum-based writing measures. Complexity included calculation of correct word sequences (CWS), defined as two adjacent correctly spelled words that were semantically and syntactically acceptable within the context of the sentence (Videen et al., 1982). Accuracy included calculation of words spelled incorrectly (WSI). Quality was scored based on a rubric proposed by Coker and Ritchey (2010). The rubric was developed to measure the quality of sentence writing in kindergarten children, so it was modified to score compositions (i.e., account for writing longer than sentences). The quality rubric takes into account how a child responds to the prompt, as well as grammatical structure, mechanics, and completeness of the composition.

GRAs worked in pairs to score compositions. Reliability of scoring was then calculated. The qualitative scoring rubric had four possible scores for each category, and hence was treated as an ordinal measure. Inter-rater reliability, measured with Cohen's kappa, ranged from .71 to .96. Because measures of productivity (WW), complexity (CWS) and accuracy (WSI) scores are continuous measures, reliability was measured by the intra-class correlation coefficient (ICC). Inter-rater reliability ranged from .92 to 1.0. The average scores of productivity, complexity, accuracy, and quality were used to represent composition skills.

Data Analysis

To probe the conditional relationships among the writing outcomes and home literacy practices, we drew on multilevel models. We used R to conduct these analyses using the "lavaan" package. We controlled for clustering by using a cluster robust estimator. We also conducted multilevel analyses to assess any differences and there were none. In addition, we also conducted the analyses in Mplus using the same estimators. Our analyses accounted for nesting of students within classrooms and examined the extent to which both spring and fall writing achievement were associated with home literacy practices. The general form of our model for each writing outcome was

$$F_{ij} = \gamma_0 + \gamma_1 X_{ij} + \sum_{k=2}^K \gamma_k L_{kij} + r_{0j} + e_{ij}$$

$$S_{ij} = \beta_0 + \beta_1 F_{ij} + \beta_2 X_{ij} + \sum_{k=3}^K \beta_k L_{kij} + u_{0j} + \varepsilon_{ij}$$
(1)

In the first equation, we use F_{ij} as a fall writing outcome (i.e., letter writing, spelling, or composition) for student i in school j using γ_0 as the intercept specific to that fall outcome, X_{ij} as the measure of socioeconomic status with coefficient γ_1 , L_{kij} as the home literacy practices (i.e. teaching reading, parent-child joint reading, child-initiated reading, independent reading, teaching writing, or independent writing) with coefficients γ_k , and r_{0j} e_{ij} as the school-specific and student-specific residuals. Similarly, the second equation describes the spring writing outcome (S_{ij}) as a function of an intercept (β_0), the fall literacy outcome (F_{ij}) with coefficient β_1 , socio-economic status (X_{ij}) with coefficient β_2 , the home literacy practices (L_{kij}) with coefficients β_k , and school-specific and student-specific residual terms (u_{0j} and ε_{ij}).

Results

The Nature of Home Literacy Practices

Table 1 outlines the descriptive statistics for study variables. With respect to reading-related home practices, on average, parents engaged in joint reading activities about 4 days per week and directly taught reading skills (i.e., letters, words) about 3 days per week. Children read independently 4 days per week. With respect to writing-related home practices, on average, parents directly taught children about writing (e.g., writing letters, names, or words) twice a month. Children worked independently on writing once a week. The descriptive statistics suggested that the use of each specific home literacy practice was highly variable across students. Table 2 further describes the variability of each practice across students by examining the extent to which the observed differences in use were associated with differences in socioeconomic status (SES). More specifically, Table 2 outlines the respective proportion of variance in each home literacy practice that is explained by SES. The results suggest that the predictive capacity of SES for use of home literacy practices varied considerably across practices. For instance, whereas SES explained about 16% of the variance in parent-child joint reading, it explained less than 1% of the variance in independent reading and independent writing.

Table 1. Descriptive statistics for the study variables.

Variable	Mean	SD	Range
Reading-related home practices			
Teaching reading	3.67	2.21	0–8
Parent-child joint reading	4.12	2.67	0–8
Child-initiated reading	3.28	2.69	0–8
Independent reading	4.79	2.38	0–8
Writing-related home practices			
Teaching writing	4.66	0.86	2.25–6
Independent writing	5.24	1.02	1–6
Child measures			
SES	8.07	3.88	0–5
Fall letter writing	24.98	11	0–48.5
Fall spelling	436.12	16.66	388.5–478
Fall composition	2.05	2.11	0–10.38
Spring letter writing	32.71	9.81	4–50.5
Spring spelling	454.11	14.35	399–509
Spring composition	5.64	2.99	0–9.12

Spelling = W scores; letter writing and composition measures are raw scores

Table 2. Proportion of variance in literacy practices explained by socioeconomic status.

Variable	Variance Explained (R^2)
Reading-related home practices	
Teaching reading	0.02*
Parent-child joint reading	0.16*
Child-initiated reading	0.08*
Independent reading	0.01
Writing-related home practices	
Teaching writing	0.08*
Independent writing	0.00

Table 3. Intraclass correlation coefficients.

Variable	Classroom Variance	Child Variance
Reading-related home practices		
Teaching reading	0.01	0.99
Parent-child joint reading	0.55	0.45
Child-initiated reading	0.34	0.66
Independent reading	0.03	0.97
Writing-related home practices		
Teaching writing	0.09	0.91
Independent writing	0.00	1.00
Child measures		
SES	0.60	0.40
Fall letter writing	0.09	0.91
Fall spelling	0.07	0.93
Fall composition	0.18	0.82
Spring letter writing	0.19	0.81
Spring spelling	0.18	0.82
Spring composition	0.25	0.75

Table 3 further probes the use of home literacy practices by examining the extent to which it is clustered in classrooms (e.g., students with similar home literacy practices are clustered in specific classrooms through self-selection in classrooms or schools). We describe the degree of clustering by comparing the proportion of variance attributable to differences among classrooms with the proportion of variance attributable to differences among students (e.g., intra-class correlation coefficient). The results again suggest substantial heterogeneity across practices in terms of clustering – that is, some practices were strongly clustered within classrooms whereas the variation in the use of other practices was largely independent of class membership. For instance, parent-child joint reading demonstrated a strong degree of clustering – roughly 55% of the total variance in the use of this practice was attributable to differences among classrooms, rather than differences among the home literacy practices of individual students and their families. Put differently, to a large degree, students in a common class either regularly read books with parents or did not – relatively, there was a very little variation on parent-child joint reading among students within the same class. In contrast, there was very little clustering of independent reading – that is, classmates' frequency of independent reading at home had little predictive value for whether a given student chose to read independently at home. Collectively, the descriptive results suggest that there was substantial variation in the use of home literacy practices, this use was unevenly clustered within classrooms, and that this variation and clustering were partly and unevenly explained by differences in SES.

Relations of Home Literacy Practices to Writing Achievement

We next investigated our research questions regarding the concurrent relationship among home literacy practices and writing skills at the beginning and end of kindergarten. We began by

decomposing the variance in each writing outcome attributable to differences among students and classrooms. The analysis suggests two results (Table 3). First, between 7% and 18% of the variance in writing skills at the beginning of kindergarten was attributable to classroom differences. Given that the assessment took place just as children entered kindergarten, these results suggest a typical level of child/family self-sorting into classrooms/schools. That is, children were more likely to be placed in classrooms/schools occupied by children that are similar to them in terms of their writing skills. Second, for each writing skill, the spring assessments noted a substantial jump in the level of clustering (Table 3). For instance, the clustering for letter writing more than doubled from 0.09 to 0.19. These results suggested that the clustering of children in terms of writing skills was both a function of student/family self-sorting into classrooms/schools and a function of the instruction in the classroom.

Having partitioned the variance in the writing outcomes, we surveyed the conditional relationships among home literacy practices and writing skills at both time points. Table 4 outlines the results for each outcome and home literacy practice. Among the home literacy practices considered, perhaps the strongest predictor was independent writing (i.e., the regularity with which a student independently works on writing letters, names or words at home). A one category increase in regular independent writing (e.g., increasing independent writing from once to twice a month or from twice a month to once a week) was associated with a 0.19 and 0.15 standard deviation increase in letter writing and spelling at kindergarten entry. In contrast to letter writing and spelling, there was no evidence that independent writing was predictive of composition during the fall assessment.

Although the regularity with which a child worked independently on writing at home was predictive of two writing skills at kindergarten entry, this same practice did not appear to account for variation in the spring writing assessments above and beyond its association with fall writing skills. More specifically, once we incorporated the positive contribution of independent writing to writing skills in the fall, there was no evidence that independent writing further augmented spring writing skills (Table 4).

In complement to independent writing at home, the most consistent predictor across writing outcomes was the frequency with which a child read independently at home (i.e., independent reading). For each additional book a child read at home, the child gained on average 0.07, 0.06, and 0.10 standard deviations in letter writing, spelling and composition on the fall assessments. Given the standard deviation of at home book reading in our sample, the results also suggest that each standard deviation increase in at home book reading (i.e., plus 2.38 books) was associated with a 0.16, 0.14, and 0.25 standard deviation improvement in fall letter writing, spelling, and composition.

Similar to the benefits of independent writing, although the frequency with which a child looked at a book independently at home was predictive of writing skills at kindergarten entry, this same practice did not consistently account for variation in the spring writing assessments above and beyond its association with fall writing skills. More specifically, once we incorporated the positive contribution of at home book reading to writing skills in the fall, there was no evidence that at home book reading further augmented spring writing skills. The one exception was spring spelling – for this skill, the role of at home book reading persisted but diminished to about half of its association with fall spelling (Table 4).

Table 4. Multilevel results for writing outcomes.

Variable	Fall letter writing	Fall spelling	Fall composition	Spring letter writing	Spring spelling	Spring composition
Intercept	7.33(4.80)	415.33(7.41)	0.49(0.95)	16.71(2.84)	200.64*(15.92)	3.85*(1.21)
Fall pretest	–	–	–	0.68*(0.04)	0.58*(0.04)	0.56*(0.08)
Teaching reading	–0.45(0.31)	–0.30(0.49)	–0.04(0.06)	0.10(0.18)	0.18(0.29)	0.03(0.08)
Parent-child joint reading	–0.28(0.40)	–0.69(0.61)	–0.05(0.08)	–0.10(0.24)	0.58(0.36)	0.09(0.10)
Child-initiated reading	–0.06(0.37)	0.15(0.58)	–0.08(0.08)	–0.15(0.22)	–0.95*(0.34)	–0.08(0.09)
Independent reading	0.72*(0.30)	0.97*(0.46)	0.22*(0.06)	0.15(0.18)	0.54*(0.27)	0.10(0.08)
Teaching writing	–0.23(0.84)	–0.49(1.31)	0.00(0.17)	–0.19(0.49)	–1.32(0.77)	–0.17(0.21)
Independent writing	2.14*(0.66)	2.47*(1.03)	0.07(0.13)	0.19(0.40)	0.75(0.62)	0.20(0.17)
SES	0.88*(0.21)	1.10*(0.31)	0.09*(0.07)	–0.15(0.13)	0.29(0.19)	–0.05(0.05)

The other types of home literacy practices (parent–child joint reading, teaching reading, and teaching writing) did not predict any fall writing outcome or any spring writing outcome. However, child-initiated reading negatively predicted children’s spring spelling skills (Table 4).

Discussion

This study was one of the early investigations to examine the relations between reading-related and writing-related home practices and children’s writing development. Our particular interest was to study three types of reading-related home practices: namely formal reading practices (i.e., teaching reading), informal reading practices (i.e., parent–child joint reading, child-initiated reading), and independent reading and two types of writing-related home practices: namely formal writing practices (i.e., teaching writing) and independent writing. The results of this study yielded three major findings. First, only one type of reading-related home practice, independent reading, was significantly related to children’s letter writing, spelling, and composition skills at the beginning of kindergarten after controlling for children’s family socioeconomic status/SES. However, the other reading-related home practices (i.e., teaching reading, parent–child joint reading, and child initiated reading) did not contribute to any writing outcome assessed at the beginning of kindergarten. Second, one type of writing-related home practice, independent writing was significantly related to children’s letter writing and spelling skills at kindergarten entry after controlling for children’s family SES. Teaching writing was not related to any writing outcome measured at the beginning of kindergarten. Third, when examining the relations between home literacy practices and children’s writing skills measured at the end of kindergarten, we found that independent reading was positively related to children’s spelling skills, but not the other writing outcomes after controlling for children’s family SES and fall writing achievement. Child-initiated reading was negatively related to children’s spring spelling skills after controlling for children’s family SES and fall writing achievement. The other reading-related and writing-related practices did not predict any writing outcome measured at the end of kindergarten. We discuss these findings more thoroughly in turn.

The first finding of note in this study demonstrated that independent reading has a positive effect on children’s letter writing, spelling, and composition skills at kindergarten entry. This finding suggests that the impact of independent reading may be broad even if it is modest. We propose that the mechanism behind this finding is that children’s independent exploration with books provides opportunities for them to recognize letters and words and understand how information is presented in text, thus enhancing abilities to write letters, spell words and sounds, and compose simple text. This finding supports the importance of children’s independent activities in the framework of home literacy practices (Teale & Sulzby, 1986). This finding also contributes to the body of evidence pointing to the importance of book reading in the home (Bus & Van Ijzendoorn, 1995; Kim, 2009; Sawyer et al., 2014), and it suggests that child-led book reading may be more beneficial for writing development than other forms of book reading in the home (e.g., parent-led book reading). Furthermore, evidence of the relationships between independent reading in the home and writing may also support theoretical approaches stating that reading and writing draw on shared knowledge (Fitzgerald & Shanahan, 2000).

On the other hand, parental teaching of reading skills, a formal parent-led activity, was not a significant predictor of children’s initial writing achievement. This type of home practice has been emphasized in the conceptual framework of home literacy practices (Sénéchal & LeFevre, 2002) and has been consistently shown in previous research to be related to code-related reading and spelling skills (Evans et al., 2000; Levy et al., 2006; Stephenson et al., 2008). On the basis of cognitive models of writing (Berninger & Swanson, 1994; Puranik & Lonigan, 2014), writing in young writers is significantly code-related. Therefore, it is logical to assume that parental teaching of reading is important for young children’s writing. The lack of impact may be due to our conceptualization of teaching reading. We asked parents to report how often they teach their children about reading in

one context: book reading. However, other studies examined parental teaching of reading skills in any context such as word reading activities and letter games.

Parent-child joint book reading and child-initiated reading (the child asked parents to read to him or her) represent parent-led book reading, informal parent-led activities. These home practices had no positive relations to children's writing achievement at the initial assessment. In fact, this pattern of results is consistent with the existing research showing that the frequency that parents read to their children is not consistently related to children's code-related reading skills (Burgess et al., 2002; Hood et al., 2008; Sénéchal, 2006). In addition, these results are also consistent with previous findings indicating that the frequency of parent-child joint book reading is not associated with young children's name writing and spelling skills (Bingham & Mason, 2018; Kim, 2009). It appears from these studies, and from our results, that simply sharing books with children in the home may not be a powerful practice for improving kindergarten children's writing skills. Perhaps children's writing skills are best facilitated when parents explicitly refer to code-related reading and writing skills during the reading.

Another possible explanation for these findings is that the relations between parent-led book reading (parent-child joint book reading, child-initiated reading) and children's writing skills may be complex and other variables may be characterized as a "bridge" between them. For example, parent-led book reading may contribute to writing skills via children's oral language skills. Research shows that the frequency of parent-led book reading was positively associated with children's oral language skills (Burgess et al., 2002; Scarborough & Dobrich, 1994). The presence of a relationship between oral language and writing skills has been well indicated in previous research studies (e.g., Olinghouse, 2008; V. W. Berninger & Abbott, 2010; Y.-S. Kim et al., 2015). Consequently, it is logical to surmise that parent-led book reading improves children's oral language skills, which in turn improves their writing skills. Similarly, parent-led book reading may have an indirect relationship with writing skills through children's independent reading. In this study, we found that child independent reading was positively correlated with parent-child joint book reading ($r = .18$, $p < .01$) and child-initiated reading ($r = .32$, $p < .01$) and child independent reading significantly predicted kindergarten children's writing skills. Thus, it is possible that parent-led book reading facilitates independent reading practices, which in turn improves writing skills. However, these mechanisms were not tested in this study. In addition, this study focused on kindergarten children; many children begin to develop independent reading skills during this period. Better understanding of the complex relations between parent-led book reading and children's writing skills is an important avenue for future research.

The second finding of note is that the facet of home literacy practices most strongly associated with children's writing skills at kindergarten entry was child independent writing. Children who independently practiced writing words and letters exhibited higher scores on writing assessments as compared to children who did not. Our findings further support the importance of child independent practices in the framework of home literacy practices (Teale & Sulzby, 1986) and align with recent empirical evidence showing that children's independent writing practices in the home predicted preschool children's letter writing and spontaneous writing (C. S. Puranik et al., 2018). Moreover, these findings support the importance of child autonomy in facilitating writing development (D. Aram & Levin, 2001). Taken together, we suggest that independently practicing writing could be encouraged by parents and certainly deserves more investigation.

The other type of writing-related home practice, namely parental teaching of writing skills, was not associated with any writing outcome at the start of kindergarten. This is somewhat surprising, because survey and observational studies have indicated that parental teaching of writing helps to build writing skills (D. Aram & Levin, 2001, 2002, 2004; Lin et al., 2009; C. S. Puranik et al., 2008; Skibbe et al., 2013). The absence of a unique contribution may indicate that child-led writing practices may be the more powerful predictor, which reduces the predictive power of parental teaching of writing. Another explanation is that our questions related to parental teaching of writing included only a couple of formal writing activities (e.g., teaching how to write letters, names or

words), rather than all of the formal writing activities that parents may have engaged in with their children. Other writing activities (e.g., drawing before writing, constructing sentences) which were not included in this study may be potentially important in facilitating writing in kindergartners. These other teaching activities related to writing merit investigation and should be included in home literacy questionnaires in future work.

The third finding of interest is that independent reading contributed unique variance to children's spelling skills at the end of kindergarten, although the influence is weak. This finding is important because it suggests that independent exploration with books still plays an important role in facilitating children's spelling development after one year of formal instruction. However, independent reading did not predict the other two writing skills (letter writing and composition) at the end of kindergarten once controlling for writing skills measured at kindergarten entry. In terms of the non-significant relations between independent reading and letter writing skills at the end of kindergarten, one observational study showed that most of the teacher-instruction time was spent on letter writing instruction in kindergarten classrooms (C. S. Puranik et al., 2014). Consequently, we argue that classroom instruction may be more influential to children's letter writing growth than independent reading in the home. In terms of the non-significant relations between independent reading and composition skills at the end of kindergarten, it is possible that independent exposure to books may facilitate children's growth in composition skills when they are older or have more proficient reading skills. The results may be different if the longitudinal study lasts longer. However, this assumption remains an empirical question and other explanations exist, requiring further research of this phenomenon.

The other facets of home literacy practices (parent-joint book reading, teaching writing, and independent writing) did not appear to be meaningful predictors of children's writing achievement at the final assessment (spring of kindergarten). A parsimonious explanation for our findings is that once children enter school, classroom characteristics (e.g., quality of reading and writing instruction) are associated with differences in literacy development to a greater extent than are home literacy practices (Aikens & Barbarin, 2008). At the time of the final assessment, children enrolled in this study had received one-year formal reading and writing instruction, which may be more influential for writing achievement than home literacy practices. This explanation is supported by our data. As shown in Table 3, more variance in children's spring writing scores were accounted for by within-classroom effects. Specifically, 19% variance in spring letter writing was explained by within-classroom effects (9% variance in fall letter writing), 18% variance in spring spelling was explained by within-classroom effects (7% variance in fall spelling), and 25% variance in spring composition was explained by within-classroom effects (18% variance in fall composition).

Not anticipated was that child-initiated reading (the child asks parents to read the book to him or her) had a trend of negatively predicting spelling skills at the end of kindergarten. The potential explanation for this finding is that parents seldom discuss code-related skills when they read books with their children (Justice & Ezell, 2000). Consequently, children do not extract much information about code-related skills from those who read to them, which may negatively impact children's spelling skills. This finding further supports that if young children are to learn code-related (e.g., spelling) skills from shared reading, parents may themselves adopt specific interactive techniques that actively engage children with code-related skills.

In addition to these major findings, we found that of the types of home literacy practices included in the study, parent-child joint book reading demonstrated a strongest degree of clustering – 55% variance in the use of this practice was explained by between-classroom variance (0% to 34% variance in the use of the other types of home literacy practices). This suggests that the significant amount of variability in shared book reading at home is attributable to the classrooms in which parents enroll their children. Further, family SES explained 16% variance in parent-child joint book reading (0% to 8% variance in the other types of home literacy practices). These findings support previous research showing that the frequency of parent-child book reading varies by children's SES and that parents of children of low SES are less inclined to read to them frequently (Evans et al., 2000; Hartas, 2011; Marjanovič Umek et al., 2005).

Limitations

Despite the contributions of the present study, several limitations warrant note. First, information regarding home literacy practices was gathered through a self-report survey which could be subject to bias. Parents' responses may be based on what they believe they should do rather than actual practice. Future investigations of home literacy practices should use an observational approach, which can provide an unbiased estimate of the frequency with which literacy practices occur within the home. A second limitation of the present study is the response scale anchors of the home literacy practice questions on the survey. The response scale for reading-related practice questions ranged from "Never" to "All the time." The response scale for writing-related practice questions ranged from "Never" to "Every day." Accordingly, these rating scales do not allow parents to specify the frequency with which they provided reading-related and writing-related activities. Therefore, employing more precise scaling options that better capture the frequency with which parents provide literacy-related activities would be a useful and important future research endeavor.

A third limitation is that we only examined home literacy practices. This is one of the rare studies that have attempted to examine both reading-related and writing-related home practices and their different relations with early writing development. Previous research studies have indicated that the home environment is less influential to children's reading trajectories than the classroom characteristics once children arrive at kindergarten (Aikens & Barbarin, 2008; Petrill et al., 2006). Therefore, it is important to measure classroom instruction to fully understand the effects of home literacy practices on children's writing skills. This is an excellent avenue for future studies. In addition, home literacy practices are situated within the greater context of parenting. A variety of additional parenting practices (e.g., parents' beliefs, parenting styles, parent-child relationship) are related to the nature of home literacy experiences and children's development and learning (L. Baker & Scher, 2002; Bingham & Mason, 2018; C. E. Baker & Iruka, 2013; Hill, 2011). Consequently, these parenting practices can influence the relations between home literacy practices and children's writing skills (Bingham & Mason, 2018). Collectively, the inclusion of these variables (i.e., classroom instruction, parenting practices) have the potential of improving our understanding of the complex relations between home literacy practices and children's early writing skills as well as how interactions between variables impact these relations. A final limitation of this study is the demographics of children in the study, which may limit generalizability to other populations. Specifically, children that participated in this study were monolingual speakers of English who are typically developing, i.e., without disabilities. Thus, it is not clear if these findings can be generalized to other populations of children, including children with disabilities and bilingual children from immigrant families whose home literacy practices might be different from the mainstream. Research efforts designed to study the relations between home literacy practices and child writing outcomes on a more general population of children are needed.

Conclusion

In conclusion, our results suggest that parents engage with children in both reading-related and writing-related home practices during the kindergarten year. Children's independent practices related to reading and writing at home had an impact on children's writing achievement at the entry to kindergarten. After a year of formal instruction, the influences of children's independent writing practices had disappeared, whereas lasting effects of children's independent reading practices on spelling development could be traced. In contrast, parent-led formal (parental teaching practices) and informal activities (parent-child joint reading) did not contribute to children's writing development. Pending future research, we tentatively encourage parents to provide frequent opportunities for their children to practice reading and writing independently. In particular, as children grow and mature into readers, parents may consider exposing their children to books in their areas of interest and providing supported independent reading of self-selected books. Independent reading can help children build a strong foundation that will boost future growth in writing. Given that the effects of

home literacy practices in this study appear to be time-limited, efforts to provide home-based intervention and instructional programs, particularly before children arrive at kindergarten, may prove to be most important in improving writing skills.

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