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Parental Writing Support and Preschoolers' Early Literacy, Language, and Fine Motor Skills

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Abstract

The current study examines the nature and variability of parents' aid to preschoolers in the context of a shared writing task, as well as the relations between this support and children's literacy, vocabulary, and fine motor skills. In total, 135 preschool children (72 girls) and their parents (primarily mothers) in an ethnically diverse, middle-income community were observed while writing a semi-structured invitation for a pretend birthday party together. Children's phonological awareness, alphabet knowledge, word decoding, vocabulary, and fine motor skills were also assessed. Results revealed that parents provided variable, but generally low-level, support for children's approximation of sound-symbol correspondence in their writing (i.e., graphophonemic support), as well as for their production of letter forms (i.e., print support). Parents frequently accepted errors rather than asking for corrections (i.e., demand for precision). Further analysis of the parent-child dyads ($n = 103$) who wrote the child's name on the invitation showed that parents provided higher graphophonemic, but not print, support when writing the child's name than other words. Overall parental graphophonemic support was positively linked to children's decoding and fine motor skills, whereas print support and demand for precision were not related to any of the

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child outcomes. In sum, this study indicates that while parental support for preschoolers' writing may be minimal, it is uniquely linked to key literacy-related outcomes in preschool.

Keywords

writing; parental guidance; early literacy; literacy skills; motor skills

Writing activities provide a unique opportunity for young children to practice fundamental early language, literacy, and fine motor skills in a meaningful and engaging context (Levin, Share, & Shatil, 1996). As a child begins to write, he or she must first generate and articulate an idea, which reinforces vocabulary and background knowledge (Whitehurst & Lonigan, 1998). In addition, the child must employ code-related skills such as letter and sound knowledge to decide which marks to place on the page and in what order, translating units of sound into units of print. Further, the child must make decisions about punctuation and other writing conventions and reflect, even implicitly, on the value of print as a vehicle for conveying meaning (Clay, 1975, 1987; Whitehurst & Lonigan, 1998). Finally, in holding and moving the writing implement, the child practices and improves his or her fine motor skills. Writing is thus a unique context in which to take advantage of and further refine foundational language, literacy, and motor competencies. Further, writing may be even more beneficial when accompanied by support from a parent or other adult (DeBaryshe, Buell, & Binder, 1996). The current study examines parents' writing support during a joint task and its relations with three skill sets that are fundamental in writing development: 1) fine motor skills, 2) spelling and decoding skills, and 3) the use of language to compose meaningful text (Berninger et al., 2006).

Strong writing skills are associated with a number of positive outcomes, including early literacy skills as well as long-term educational and career success (Graham & Hebert, 2010). Correlational research demonstrates that children with stronger writing skills have more sophisticated letter knowledge, phonological awareness, and spelling competence, as well as larger vocabularies (Bloodgood, 1999; Levin et al., 1996; Molfese, Beswick, Molnar, & Jacobi-Vessels, 2006). In addition, writing skills have been found to strongly relate to fine motor skills – as strongly as they relate to children's letter knowledge (Gerde, Skibbe, Bowles, & Martoccio, 2012). Advantages associated with early writing proficiency appear to endure over time. Children's word writing skills at the end of kindergarten uniquely predict children's literacy skills including spelling, reading comprehension, and oral reading at the end of first grade, controlling for vocabulary, IQ, and concepts of print (Levin et al., 1996). More recently, a comprehensive meta-analysis concluded that being able to write letters and one's own name during preschool and kindergarten predict and support decoding, reading comprehension, and spelling achievement in first grade and beyond (Lonigan, Schatschneider, & Westberg, 2008).

Writing activities encourage children to practice literacy and fine motor skills, which may engender a cascade of positive learning outcomes (Puranik, Lonigan, & Kim, 2011). For example, activities that involve early letter and sound learning are associated with growth in phonological sensitivity, alphabet knowledge, and knowledge of letter sounds (Evans, Shaw,

& Bell, 2000; Sénéchal & LeFevre, 2002; Sénéchal, LeFevre, Thomas, & Daley, 1998), which leads to later improvements in both word reading and comprehension (Al Otaiba, Puranik, Ziolkowski, & Montgomery, 2009; Bus & van IJzendoorn, 1999; Ehri et al., 2001; Ehri, 2004). Recent work also suggests that because writing activities combine fine motor movements and visual processing, they may foster children's literacy skills (Neumann, Hyde, Neumann, Hood, & Ford, 2012). More striking still, an intervention study with children ages 3-5 showed that when children practiced writing, their emergent literacy skills improved significantly in comparison to peers who only interacted with storybooks (Aram & Biron, 2004). Although the import of writing has been established for a number of literacy-related outcomes, many questions remain regarding what parents can do to support children's writing.

In addition to examining children's decoding, sound awareness, and alphabet knowledge skills, we investigate how children's fine motor skills and vocabulary relate to the supports that parents provide during writing activities. Fine motor skills place limits on how much text children can produce and how quickly they can produce it (Berninger, 1999), as well as how much attention children can focus on meaning-related aspects of writing as opposed to the mechanical aspects (Puranik & Apel, 2010; Puranik & Al Otaiba, 2012). For language skills, we sought to replicate and extend the findings of Sénéchal and colleagues (Sénéchal & LeFevre, 2002; Sénéchal et al., 1998), who used parent-report measures to assess parents' support for children's writing and letter learning and found no links with children's vocabulary skills.

How Do Writing Skills Develop?

Given the complexity of the writing process and its short- and long-term relations to valuable early outcomes, it is important to understand how children develop and integrate these component skills over time. Writing has its earliest beginnings in children's drawings, which use physical marks to communicate about objects and ideas (Levin & Bus, 2003). Children form ideas first about the universal features of writing (e.g., linearity, symbolic function of letters for spoken sounds) and subsequently the features of writing that are specific to a given language (e.g., directionality, conventional spelling; Puranik & Lonigan, 2011; Tolchinsky, 2003). Throughout this process, children's written products progress through a relatively predictable series of stages, from scribbling to scribble writing to forming letter-like shapes to using conventional letters (Puranik & Lonigan, 2011; Sulzby, 1992). Children's progress is characterized by increasingly sophisticated compositions with gradually more accurate approximations of conventional writing, with concerns about precise letter formation and appropriate spelling becoming relevant only in the final stages. Congruent with these stages, the current study examines writing using an emergent literacy perspective, which is based on evidence suggesting that children acquire many skills associated with literacy and writing development before kindergarten (Teale & Sulzby, 1986; Whitehurst & Lonigan, 1998).

The Role of Parents in Children's Writing Development

A major factor in the development of early literacy skills, including writing, is social interactions with and observations of caregivers and other adults (Aram & Levin, 2011; Teale & Sulzby, 1986; Whitehurst & Lonigan, 1998), especially parents (National Institute of Child Health and Human Development Early Child Care Research Network (NICHD-ECCRN), 2004). There is evidence that parents of preschoolers practice writing letters and words with their children on a regular basis (Hindman & Morrison, 2012; Levy, Gong, Hessels, Evans, & Jared, 2006). These efforts appear to benefit children. One of the earliest studies of parent-child writing activities examined the quality of 5- and 6-year-old children's production of a letter (i.e., a letter to a friend, relative, or fictional character) both with and without the help of their mother (DeBaryshe et al., 1996). Children produced longer letters, followed writing conventions more closely, and used better spelling when they had help than when they wrote independently. Similarly, other research has observed that when parents provide more directive instruction in a joint writing task with their preschoolers, children produce more conventional writing output (Burns & Casbergue, 1992). Given the role of writing as an opportunity to practice other skill sets, parents' efforts may transfer to other areas; for example, Evans and Shaw (2008) reviewed evidence showing that parents' writing with children was linked to stronger letter knowledge, phonological awareness, concepts of print, and printed words. Several concurrent and longitudinal studies have confirmed these findings (Hindman & Morrison, 2012; Hood, Conlon, & Andrews, 2008; Levy et al., 2006; Sénéchal & LeFevre, 2002).

Yet, to date, few studies have unpacked parent-child writing interactions to observe what parents actually say and do to teach their children about writing and, in particular, how parents might differ from one another in these efforts. Parent-child writing interactions in English have seldom been observed during the preschool years; however, when studied directly, parents vary in how they support children's writing (Bennett, Weigel, & Martin, 2002). To understand these nuances, the current study uses a fine-grained paradigm that was developed for directly observing the content and quality of mothers' writing support in low-SES Israeli families (Aram & Levin, 2001, 2004). The paradigm involves analyzing videotaped observations of mothers and children during a joint writing activity, focusing on two major tasks: isolating sounds within words to match them with corresponding letters (i.e., graphophonemic support), and producing letter forms on paper (i.e., print support). Although parents sometimes choose to write down children's ideas for them (Burns & Casbergue, 1992), the current coding system also gauges the parent's efforts to involve the child in actively producing writing using the same techniques as expert writers, including segmenting the words into sounds, connecting those sounds with the appropriate letters, and forming letters and words on the page (Ehri et al., 2001).

In addition to graphophonemic and print support, the current study investigates an aspect of parents' writing support that has received little attention: demand for precision. As children progress through the stages described above, their writing is often unconventional with respect to the shapes of the letters, the spacing between the letters, the horizontal and vertical alignment of the letters, and the size of the letters (Ehri et al., 2001; Puranik & Lonigan, 2011). Demand for precision captures how parents react to mistakes in children's

written products, specifically assessing the degree to which parents point out errors in children's writing and request that the child make corrections (Aram, 2007). Although parents have been observed to demand precision from children's writing in Hebrew (Aram, 2010), European American parents do not appear to focus as strongly on correct form during writing activities (Huntsinger, Jose, Larson, Krieg, & Shaligram, 2000).

Studies have used this paradigm to examine mothers' support for kindergarteners' writing in different countries and have found substantial variation across mothers on nearly all aspects of the coding system (Aram & Levin, 2001; Lin et al., 2009). For example, in a sample of 41 kindergarten children, the quality of mothers' assistance during the writing process was associated with concurrent word writing, word recognition, and phonological awareness skills, when accounting for the overall home literacy environment (Aram & Levin, 2001). Furthermore, findings from other work with similar samples ($n \approx 50$) of Hebrew-speaking families suggests that parents who utilize greater demand for precision have children with higher early literacy skills, including word writing, letter knowledge, and phonemic awareness (Aram, 2007, 2010). Similarly, longitudinal links have been demonstrated between these three aspects of parents' writing support during the preschool and kindergarten years and children's spelling, word reading, reading comprehension and linguistic knowledge as late as at the end of second grade in other orthographies (Aram, 2010; Aram & Levin, 2002, 2004; Levin, Aram, Tolchinsky, & McBride, 2013; Lin et al., 2009).

These studies provide strong evidence that parents vary in what they say and do to guide preschool children's efforts during writing activities, and that the support that parents provide can have a unique effect on children's emergent literacy development during kindergarten and the early elementary school years. However, this work has focused largely upon orthographies other than English. Because English is a deep orthography in which rules of sound-symbol correspondence are frequently irregular, parental support and guidance might be different from that observed using other orthographies. When parents have been observed to engage in joint writing with their children in English, they do not always promote letter-sound correspondence, and instead sometimes choose to dictate letters to their children (Burns & Casbergue, 1992) or encourage them to copy letters from their surroundings (Neumann, Hood, & Ford, 2012). The current study investigates what types of writing support English-speaking parents use with their preschool children and whether the levels of writing support used are related to children's vocabulary, decoding, and fine motor skills.

Nuances of Parent Support: Name Writing as a Unique Opportunity

It is possible that writing one's name elicits different types of support from caregivers than other types of writing, which is one focus of the current study. Children's earliest explorations of writing tend to focus on their own name, which is particularly meaningful for them (Bloodgood, 1999; Treiman, Kessler, & Bourassa, 2001). In addition, children tend to learn the letters in their name sooner than other letters in the alphabet and are especially likely to write and identify the first letter in their first name (Treiman & Broderick, 1998). Children are likely to hear, see, and practice their own names with far greater frequency than

other words, meaning that their name writing skills might be quite different from their more general writing skills (Aram & Levin, 2002), particularly as the difficulty of the writing task is related to the writing output that children produce (Puranik & Lonigan, 2011). The current study investigates whether parents provide different support when helping children to write their own names as opposed to other words.

Research Questions and Hypotheses

In light of the emerging research base on the role of writing in refining children's skills around alphabet, phonological, vocabulary, and fine motor skills, as well as the open questions regarding how parents' support for writing might be linked to these foundational skill sets, the current study examined three broad research questions in an English-speaking sample.

1) What is the Nature and Variability of Parents' Support when Working with their Preschool-aged Children on a Semi-Structured, Joint Writing Activity?

Parents are expected to provide a variety of supports to children, but are generally predicted to use lower levels of graphophonemic and print support with preschool children than have been reported for kindergarteners and elementary school students in previous work (Aram, 2010; Aram & Levin, 2001). In terms of demand for precision, we predict that parents of preschoolers will be less insistent than parents of older children, aiming to help children produce the correct letters in the correct positions, but making allowances when children have difficulties (Aram, 2007).

2) Does Parents' Support Differ for the Child's Own Name Versus Other Words?

Parents are hypothesized to provide higher levels of support for children's own names as compared to other words, as children's knowledge about writing their own name tends to be more advanced than their skills for writing other words (Bloodgood, 1999; Levin, Both-De Vries, Aram, & Bus, 2005; Puranik et al., 2011).

3) How Does Parental Writing Support Relate to Preschool Children's Concurrent Literacy, Language, and Fine Motor Skills?

It is hypothesized that parents' support will be positively related to children's literacy and fine motor skills (Aram, 2007; Aram & Levin, 2001; Lin et al., 2012), but not to their vocabularies (Sénéchal & LeFevre, 2002; Sénéchal et al., 1998).

Method

Participants

The sample included 135 preschool children (72 girls) and their parents (126 mothers, 9 fathers) who participated in a longitudinal study ($n = 353$) of children's academic and social development. Families resided in a suburban area near a major Midwestern city in the United States. All preschool children in one public school district were recruited through parent orientations and backpack mailings in the fall of two consecutive school years. Children were selected for the current analyses if they participated in a summer home visit,

which included the writing activity. Families were encouraged to speak whatever language they were comfortable speaking during the home visit and only families who chose to speak English during the writing activity were included in the current analyses. Eleven of the families included reported that English was not their native language and 15 did not report this information. Children in the current study were on average 4.56 years old ($SD = .55$, $min = 3.58$, $max = 5.81$) and had either just finished their first ($n = 69$) or second ($n = 66$) year of preschool at the time of the writing activity. The majority of these children were European American ($n = 90$), but the sample also included African American ($n = 6$), Asian American ($n = 6$), Middle Eastern ($n = 5$), and multiracial children ($n = 11$). Seventeen families did not report their children's ethnicity. On average, mothers had 16.21 years ($SD = 1.87$, $min = 10$, $max = 18$) of education, or the equivalent of a four-year college degree.

Procedure

Parental support for children's writing was videotaped during a joint writing activity that took place as part of a one-hour home visit between May and July. The task was administered by one of several trained undergraduate or graduate research assistants. At the beginning of a pretend birthday party task, the parent-child dyad was asked to complete a blank invitation that could be used to invite someone of their choosing to the pretend party. Specifically, the researcher said, "There are two party invitations and a marker for you to fill them out," leaving families the choice of how to proceed. Families were aware that the study focused on literacy development but they were not explicitly told that their writing interactions would be analyzed. Each invitation included five sections that required a response: 1) To, 2) For (very often the child's name), 3) Date, 4) Time, and 5) Place. Parents and children chose what to write in each segment of the invitations and generally wrote between one and five words per section. Although two invitations were used to make the birthday party more realistic, the current study focuses only on the first invitation as invitations rarely differed from one another when both were completed, and many families did not choose to complete the second invitation.

Parents provided demographic information and reports about the home learning environment (to be used as covariates in the analyses) immediately after the home visit by completing two surveys and mailing them back to the research team. Children's literacy and language skills were assessed individually in their preschools during the spring immediately before the home visit. Children's fine motor skills were assessed during the home visit by one of the trained research assistants.

Measures

Parental writing support—Based on work by Aram and Levin (2001), parents' support for writing was observed by separately analyzing and coding each letter that parents or children wrote on the invitation. Thus, if a child wrote "Cat", there would be three codes for the parent's print support and three codes for the parent's graphophonemic support. If more than one type of support was provided for a single letter, the highest level of support was coded. A master coder worked with four undergraduate research assistants, each of whom completed extensive training and several rounds of practice coding. Specifically, the master coder first explained the aims of the study and then described the coding system in detail

without mentioning any of the study hypotheses. After studying a coding manual, research assistants coded several videos in conjunction with the master coder until they achieved acceptable reliability (i.e., 85% agreement or higher) with the master coder. Finally, coders worked independently but their reliability was checked every few months in order to prevent drift.

Parental graphophonemic support: The graphophonemic support scale captured the process the parent used to help the child to isolate each sound in a word and determine which letters should be written (for a detailed scale description see Appendix A in the online supplementary materials accompanying this article). Possible scores ranged from one (low) to nine (high), reflecting the degree to which the parent facilitated the child's independent isolation of a sound and its connection with the correct letter. The scores for each of the letters were averaged across the entire invitation to produce one average score for graphophonemic support. When the child succeeded in choosing and forming the letter independently without any assistance, the letter was assigned a score of 10. Individual letters that were coded as 10 were not counted towards parents' writing support in order to focus our analyses on letters for which parents provided aid. By extension, children who received a score of 10 for every letter ($n = 10$) were entirely excluded from the analyses involving graphophonemic support.

Lower levels of support included instances in which the parent did not attempt to help the child isolate the sound and said the word as a whole, said the word slowly as a sequence of sounds or syllables, or spelled all of the letters in the given word at the same time. Higher levels of support involved the parent providing clues so that the child could independently match a sound with its corresponding letter. For example, the parent could have dictated each letter separately as the child wrote, emphasized a consonant-vowel or vowel-consonant sound and told the child the corresponding letter, or encouraged the child to isolate a sound and match it with its corresponding letter. Interrater reliability was calculated on the average graphophonemic scores for the master coder and 4 additional coders using intraclass correlations (ICC) (Shrout & Fleiss, 1979). The average ICC for this scale was .94, indicating strong reliability (i.e., well above the conventional threshold of .80).

Parental print support: The print support scale focused on how the parent helped the child to draw the letter forms on paper (for a detailed scale description see Appendix B in the online supplementary materials). Each letter was assigned its own score, which reflected the parent's assistance in writing that letter. Scores ranged from one (low) to nine (high), reflecting the degree to which the parent facilitated the child's independent production of the correct letter shape. Scores for each letter were averaged across the entire invitation to produce one average score for print support. As above, each conventional letter that the child successfully produced independently (i.e., without parental assistance) was assigned a score of 10 and was not counted towards parents' average print support scores. Likewise, because we were primarily interested in the support that parents provided for children as they printed letters on the invitation, parents whose children successfully printed all the letters without parental support ($n = 29$) were not included in the descriptive analyses of the present study.

Scores on the print support scale reflect a theoretical division between low and high support for children's independent work. Lower levels of support included: (1) the parent did not provide assistance and the child wrote an unconventional approximation of the letter, (2) the parent wrote the letter him/herself, and (3) the parent wrote the letter while holding the child's hand. Higher levels of support involved the parent providing clues regarding the shape of the letters so that the child could write the letter independently. For example, the parent may mark dots on the page so that the child can trace the outline of the letter, give a visual clue such as tracing the letter in the air with her finger, or encourage the child to think of clues and remember how to draw the letter. Appendix B in the accompanying online supplementary materials includes examples for each level on the print support scale. The average ICC for this scale was .93, indicating strong inter-rater reliability.

Parental demand for precision—This scale was designed to complement the coding schemes for the two major forms of parental writing support by examining whether and how the parent pointed out errors in the child's writing and asked the child to correct the errors (for a list of eligible errors, see Appendix C in the online supplementary material). Unlike print and graphophonemic support (for which each letter was coded and then an average was calculated for each section by collapsing across all letters in that section), up to three errors were coded for *each segment* of the invitation. Thus, each child may receive up to fifteen scores on the demand for precision scale, as there are five parts of the invitation (i.e., To, For, Date, Time, and Place). Scores were averaged across the invitation to create one combined demand for precision score.

Possible errors include incorrect spelling, spacing, or placement of letters on the lines of the invitation, or mistakes in drawing the letters properly. If an error was present but the parent did not point it out or ask the child to correct it, a 1 for precision was assigned. A score of 2 was assigned when the parent identified an error but did not ask the child to correct it. Finally, a score of 3 was assigned when the parent both pointed out an error and asked the child to correct it, regardless of whether the child was able to completely correct the error. For the purpose of this study, numbers and punctuation were not included in any analyses. If no errors were present on the given segment, that part of the invitation was not counted towards the parent's demand for precision score. Likewise, if there were no eligible errors on the entire invitation, dyads ($n = 47$) were not included in the analyses of demand for precision. The average ICC for this scale was .98, indicating very strong inter-rater agreement.

Demographic information—Basic data about the child and family, including parents' education levels, child gender, race, and birth date, were collected using a demographics questionnaire that parents filled out after the home visit. The questionnaire required approximately 10 minutes to complete.

Home learning environment—Parents also completed a 15-minute, 50-item questionnaire regarding their beliefs and practices in three domains of parenting: Warmth/Responsivity, Management/Discipline, and the Home Learning Environment (HLE) (Morrison & Cooney, 2002). The majority of the items required parents to rate a given behavior on a Likert-type scale ranging from 1 = “not at all like me,” to 5 = “very much like

me". The remaining items requested a raw number to estimate of the number of learning materials (e.g., storybooks) in the home or the number of hours spent each week on specific activities (e.g., number of hours each week spent using educational computer software). The HLE composite was comprised of parents' ratings on seven items assessing their engagement in literacy activities (e.g., "Frequency of teaching child letter names," and "How frequently do you teach your child letter sounds?") and math activities (e.g., "I encourage my child to do math-related activities") with the child in the home. Factor analysis demonstrated that the three-factor solution described above was a good fit to the data (Hindman & Morrison, 2012). The factor loadings of the HLE items ranged from .41 to .84 and Cronbach's alpha was .75 in diverse samples of kindergarten children (Morrison & Cooney, 2002). Because some families ($n = 7$) were missing responses on one or more HLE items, responses on the seven items were averaged to create the HLE composite.

Child outcomes—Children's literacy and language skills were assessed directly using the Woodcock-Johnson III Tests of Achievement (WJ-III) (Woodcock, McGrew, & Mather, 2001) as well a measure of alphabet knowledge. In particular, three subtests of the WJ-III were used: Letter-Word Identification, Sound Awareness, and Picture Vocabulary. The present study reports children's performance using *W* scores, which have properties similar to a Rasch ability scale (Rasch, 1980). *W* scores are a conversion of raw scores based on a centered score of 500, which is the average achievement level for a 10-year-old child (Mather & Woodcock, 2001). They have useful psychometric properties including equal-interval measurement characteristics, which allows for accurate comparison of children of different ages in our study. Fine motor skills were assessed separately during the home visit.

Alphabet knowledge—Children's ability to identify the letters of the alphabet was assessed using lower-case alphabet flashcards presented one at a time and in random order, with a possible score of 26. This measure has demonstrated high reliability ($\alpha = .91$) in previous research (Skibbe, Connor, Morrison, & Jewkes, 2011).

Decoding—The WJ-III Letter Word Identification subtest was used to assess children's letter identification and early decoding skills. Children were first asked to identify specific letters in a variety of ways (e.g., pointing to the letter that matches a target letter on the same page, pointing to the letter the researcher says, and saying the names of letters as the researcher points to them). Then children were asked to decode increasingly complex words. For children 4 to 6 years of age, reliabilities on this measure range from .98 to .99.

Vocabulary—The picture vocabulary subtest from the WJ-III was used to assess children's expressive vocabulary. Children were asked to name pictures of increasingly unfamiliar objects. For children ages 4 to 6, reliabilities on this measure range from .70 to .81.

Phonological awareness—Children's phonological awareness was assessed using the WJ-III Sound Awareness subtest. As part of this measure, children completed items focused on rhyme (e.g., In my house, I saw a little....), deletion (What is cowboy without the boy?), substitution (e.g., If I say penny and then change the pen to sun, the new word would be...), and reversal (e.g., Say "corn....pop" backwards). Reliabilities on this measure range from .71 to .93 for children 4 to 6 years of age.

Fine motor skills—Children's fine motor skills were assessed with the Early Screening Inventory-Revised (ESI-R; Meisels, Marsden, Wiske, & Henderson, 1997), an established tool for assessing preschool children with strong reliability ($r = .82$), as well as high concurrent and predictive validity (Meisels, Wiske, & Tivnan, 1984). The fine motor scale includes 11 items or tasks such as building a tower, bridge, and gate with blocks; using a pencil to copy shapes; and using a pencil and paper to draw a person from memory. Except for the items that required children to build a bridge and draw a person, which were scored 0, 1, or 2, all items were scored 0 if fail or 1 according to diagnostic criteria. On the draw-a-person item, the number of body parts determined the score of 0, 1, or 2. We created a composite fine motor score by summing children's scores on each of these items.

Results

Question 1: Nature and Variability of Parents' Writing Support

Our first aim was to explore the nature and variability of writing support that parents provided. Descriptive statistics and correlations for parents' writing support and the child's age at the home visit, maternal education, and the home learning environment composite are presented in Tables 1 and 2. It should be reiterated that for both graphophonemic and print support, the letters that children successfully isolated or printed without any parental support (i.e., a score of 10 was assigned) were excluded from analysis. Moreover, as explained above, children who wrote all of the letters on the invitation without one or both types of support ($n = 10$ for graphophonemic support, $n = 29$ for print support) were not included in the descriptive analyses. Likewise, dyads ($n = 47$) whose invitations contained no errors that were eligible for the demand for precision coding were excluded from descriptive analyses. Children in the 35% of dyads who did not make any eligible errors on the invitation were significantly younger than those who did ($t(124) = -2.57, p = .011$), and they also had poorer decoding skills ($t(125) = -2.41, p = .017$), alphabet knowledge ($t(122) = -2.63, p = .010$), and fine motor skills ($t(116) = -2.87, p = .005$). None of the parent support variables were significantly correlated with any of the demographic variables except graphophonemic support, which was significantly correlated with the home learning environment composite ($r(105) = .35, p < .001$). There were no differences in graphophonemic support, print support, or demand for precision for girls and boys ($ts < 1.96, ns$).

Graphophonemic support—Parents provided an average level of graphophonemic support ($M = 2.38, SD = 1.45$) indicating that they said the words to be written out loud as a slow sequence of sounds or syllables. Parents infrequently encouraged children to isolate sounds within the words or match them with their corresponding letters (See Table 1). The distribution of the graphophonemic scores was positively skewed, with the most frequent scores being one (i.e., the parent said the whole word without breaking it into sounds) and four (i.e., the parent provided the spelling of the word without making connections between the sounds and letters). Parents' tendency was either to say each word at a normal speed without breaking it into sounds, or to spell the word for the child by saying each letter separately. A few parents had higher average scores, with a maximum of 7.71, showing that at least some parents did engage the child in the process of segmenting words into sounds and choosing the appropriate letters.

Print support—On average, parents printed the letters themselves and did not facilitate their children's independent production of letters on paper ($M = 2.60$, $SD = 1.48$; see Table 1). Twenty-four percent of dyads had an average score of 2.00 on the print support scale, suggesting that the parent wrote most of the letters on the invitation. The distribution of print scores was again positively skewed, with a mode of two (i.e., the parent wrote the letter him or herself). There were, however, parents who had higher average scores (max. 8.33), indicating that some parents used verbal clues to either describe letter shapes or to encourage children to retrieve letter shapes from memory so that they could draw the letters.

Demand for precision—On average, when children made a mistake writing part of the invitation, parents tended to ignore the error ($M = 1.39$, $SD = .54$; See Table 1). The distribution of demand for precision scores was also non-normal, with a strong mode of one (i.e., parents tended not point out errors or ask their children to correct them). However, there were several parents who received an average score of three on this scale, indicating that when their children made a mistake, they pointed out the mistake for the child and requested that the child correct it.

Associations between different types of support—Bivariate correlations demonstrated a moderately strong, positive association between parents' graphophonemic and print support, $r(106) = .57$, $p < .001$. There were no significant associations between demand for precision and graphophonemic and print support, $r(88) = .11$, ns , and $r(88) = .08$, ns , respectively.

Question 2: Writing Support for the Child's Name

An additional aim was to explore how parents' support for children's writing differed when children were writing their own name as opposed to other words. This analysis could only be carried out for dyads ($n = 103$) who wrote the child's name on the invitation; dyads who did not write the child's names ($n = 32$) were excluded. Dyads who did not write the child's name were not significantly different from other children in terms of their language, literacy, fine motor skills, maternal education, parent writing support, and the home learning environment ($ts < 1.73$, ns). Some dyads did not write their name on the invitation because they chose to make the pretend birthday party for someone other than the child or because they left that line blank. As described above, children who successfully wrote the invitation (or in this case, their names) without parent writing support were also excluded from the analyses looking at graphophonemic support, print support, and demand for precision, respectively. We used paired-sample t -tests to compare parents' average support scores for children's names and other words. The results showed that on average, parents provided higher levels of graphophonemic support for their child's name ($M = 2.15$, $SD = 1.41$) than for all other words ($M = 1.70$, $SD = 1.06$), $t(59) = 2.52$, $p = .014$. There was no corresponding difference for print support for the child's name ($M = 2.38$, $SD = 1.49$) versus other words ($M = 2.17$, $SD = .65$), $t(47) = 1.30$, ns .

Question 3: Associations between Parental Writing Support and Concurrent Child Skills

Our third major aim was to examine associations between parental support for writing and children's emergent literacy, vocabulary, and fine motor skills. Descriptive statistics for all child background and outcome variables included in these analyses are provided in Table 3.

As stated above, the parent writing support variables were highly skewed, so for the purposes of this research question they were translated into categories. Based on the distribution of the data, graphophonemic support was divided into four categories of roughly equal size (i.e., scores of 1-1.9 indicating very low levels of support, 2-2.9 for lower levels of support, 3-3.9 for medium levels, and 4 or higher for high levels of support). Two categories were created for print support (i.e., scores of 1 to 2.9 for low levels of print support), and scores of 3 or higher for high levels of support), and two categories were created for demand for precision (i.e., scores of 1 for low demand for precision and scores of 2 to 3 for high).

Path analysis with Amos software (version 20) (Arbuckle, 2011) was used to examine associations between parental writing support and each of the child outcomes. This approach allowed us to use full-information maximum likelihood (FIML) estimation to handle missing data, thus retaining all children, whereas linear regression with list-wise deletion would drastically limit the sample size and bias the estimates (Arbuckle, 1996). Each of the parent writing support predictors was examined in a separate model because different numbers of children had to be excluded from the analysis for each type of support and we did not want the data for those children to be accounted for using FIML.

Correlations between all of the outcome variables were included in each model. Covariates included child gender, child race (i.e., white vs. nonwhite), child's age at home visit, child's age at the literacy and vocabulary assessment, mothers' level of education (in years) as a proxy for socioeconomic status, and the home learning environment composite from the parenting questionnaire. Covariates were included as predictors of each of the outcomes but were trimmed if they were not significant at the .05 level. Correlations between individual covariates and the writing support variables were only included if significant correlations were detected in preliminary analyses. The path models were replicated excluding families whose home language was not English ($n = 11$ total) and the patterns of findings were similar to those presented here. Coefficients from the three path models, including any significant covariates, are included in Table 4.

Graphophonemic support—Because there were four categories of graphophonemic support, dummy variables were used to compare each category to the reference group, which was the lowest level (category 1) of graphophonemic support (See Table 4). The third category showed a significant, positive association with children's decoding skills ($b = 0.17$, $p = .042$). Category four was significantly associated with children's fine motor skills ($b = 0.20$, $p = .014$). The model for graphophonemic support fit well: $\chi^2(29) = 33.97$, $p = .240$; CFI = .991; TLI = .976; RMSEA = .037.

Print support—Print support was not significantly related to children's decoding ($b = -0.02$, ns), vocabulary ($b = 0.07$, ns), sound awareness ($b = 0.03$, ns), alphabet ($b = -0.06$,

ns), or fine motor skills ($b = 0.15, p = .080$). The print support model had good fit: $\chi^2(21) = 19.51, p = .553$; CFI = 1.000; TLI = 1.009; RMSEA = .000.

Demand for precision—Demand for precision was not related to any of the child outcomes: fine motor skills ($b = -0.11, ns$); decoding ($b = 9.06, ns$); vocabulary ($b = 7.27, ns$); sound awareness ($b = 1.11, ns$); and alphabet knowledge ($b = -0.76, ns$). The model showed good fit to the data: $\chi^2(22) = 16.01, p = .816$; CFI = 1.000; TLI = 1.046; RMSEA = .000.

Discussion

The current study investigated parents' writing support during an invitation-writing task that took place as part of a semi-structured, pretend birthday party activity in the home. In contrast with much of the previous work using this coding system, which has examined parents as they help children to write pre-determined lists of words (Aram & Levin, 2001, 2004), this task provided a naturalistic window into parents' spontaneous writing support. In addition, the semi-structured nature of the task was appropriate for preschool-aged children, who have relatively few resources to devote to composition during the writing process (Puranik & Lonigan, 2011), and it allowed for easy comparison of the writing interactions between different parent-child dyads.

Similar to previous research (Aram, 2010; DeBaryshe et al., 1996), parents varied in the quality of graphophonemic and print supports that they provided for their children. The individual variability in instructional techniques utilized is not unique to writing and likely reflects variations in socio-demographic characteristics as well as differences in personality, parenting styles, and attitudes toward how best to influence children's literacy and writing skills (Cottone, 2012; Curenton & Justice, 2008; DeBaryshe, Binder, & Buell, 2000; Diaz, Neal, & Vachio, 1991; Weigel, Martin, & Bennett, 2006). For example, Lynch and colleagues (Lynch, Anderson, Anderson, & Shapiro, 2006) found associations between parents' beliefs about literacy (i.e., skills-based vs. wholistic approaches to reading) and the way that they taught children about reading and writing (i.e., explicit teaching vs. general encouragement). In addition, similar to many teachers (Powell, Diamond, Bojczyk, & Gerde, 2008), parents may not actively involve children in the writing process until children themselves take the initiative to demonstrate their interest in writing.

Variability in writing support also likely reflects parents' sensitivity to children's skill levels and performance during the task (DeBaryshe et al., 1996). Korat and Levin (2001) found that mothers seemed to respond to children's independent writing skills by allowing children with stronger skills to lead the interaction more than children with weaker skills. Aram's (2007) work with twins also shows that mothers adjusted their support to children's different levels of writing skill. Although the extent to which parents in this study were responsive to their children's performance and skill levels is unknown, on average, when parents provided graphophonemic support to their children, they were most likely to say the word as a whole or to spell the word out as a complete sequence of letters. Parents were not likely to help children to isolate particular sounds within words, even though previous research has established that activities that explicitly focus on letter-sound correspondence are beneficial

for children's literacy development (Evans & Shaw, 2008; Whitehurst & Lonigan, 1998). It seems that parents focused on other aspects of writing such as correct spelling and content generation rather than letter-sound correspondence.

Parents may face challenges when supporting children's writing in English because it is a phonologically opaque language: letters are not always associated with the same sound (e.g., cat versus cease) and the same sound can be produced by different letters (e.g., key and cat). This may be a factor to consider when interpreting our finding that parents very rarely encouraged their preschoolers to make connections between sounds and letters. However, past studies have shown that even in languages with more regular orthographies, such as Hebrew, many mothers preferred to dictate letters to their children and did not consistently link letters with their sounds (Aram, 2007, 2010). It is also possible that these findings reflect mothers' overall knowledge base about phonological awareness. Many educators do not understand how phonological awareness relates to overall reading development (Bos, Mather, Dickson, Podhajski, & Chard, 2001), so it is plausible that most parents also do not have access to this knowledge. Future research should consider whether boosting parents' knowledge in this area, thus encouraging higher levels of graphophonemic support, would benefit children's literacy development.

Nevertheless, results demonstrated that parents who provided higher levels of graphophonemic support had children with higher decoding and fine motor skills. It is possible that parents provided a higher level of support to those children who already had more sophisticated literacy and motor skills, indicating that parents were working at children's developmental level (Aram, 2007; Aram & Levin, 2001). Alternatively, the level of parental support observed during the writing activity may be one reason why some children have higher literacy skills than others. Previous longitudinal research supports this claim, as mothers who provided higher levels of graphophonemic support in preschool and kindergarten had better literacy skills later on (Aram & Levin, 2004; Lin et al., 2009). With regards to fine motor skills, parents may have provided higher levels of graphophonemic support to children with stronger skills because they recognized, either implicitly or explicitly, that children who are better able to carry out the mechanical aspects of writing have more cognitive resources to devote to letter-sound correspondence (Puranik & Apel, 2010). When accounting for the home learning environment, parental graphophonemic support was not a significantly predictor of children's alphabet skills, likely because the home learning environment and graphophonemic support were significantly correlated ($r = .35$) in this sample. Graphophonemic support was not related to children's vocabulary skills. This finding is in line with past research showing that parents' attempts to teach children letters and sounds are not related to children's vocabulary skills (Sénéchal et al., 1998). This lack of association also suggests that parents are not simultaneously teaching letter-sound correspondence and vocabulary.

For print support, approximately 24% of parents wrote the letters themselves. It is striking that so many parents chose to print the letters instead of encouraging their children to attempt them. There are many reasons why parents may have chosen not to encourage their children to write, and further study will be needed to investigate the factors affecting this decision. In the context of the invitation-writing activity, parents may have reasoned,

perhaps correctly, that asking preschoolers to write letters would detract from their ability to focus on the meaning-related aspects of the invitation (Puranik & Apel, 2010). Parents' decision to write the letters thus may have been a response to children's skill levels, intended to transfer the burden of the fine motor, mechanical aspects of writing from the child to the parent. Alternatively, some parents chose to write the letters by holding the child's hand. Although providing assistance through the use of physical contact is often thought to be appropriate and supportive (Hertenstein, 2002), physical support may also be disruptive, as indicated by research showing that such support is negatively correlated with children's literacy skill development (Aram, Most, & Ben Simon, 2008). There were no significant relations between print support and children's literacy skills. Indeed, the way parents teach children to create letter shapes on paper does not seem to relate even to children's knowledge of letters. Finally, as expected based on past research (Sénéchal & LeFevre, 2001; Sénéchal et al., 1998), print support was not significantly related to children's vocabulary skills. Parents' efforts to help children remember letter shapes and write the letters on paper did not seem to be shaped by children's language skills.

In addition to investigating instructional levels, the current study assessed the degree to which parents pointed out and/or corrected children's errors during the writing process (i.e., demand for precision). To start, many dyads had invitations with no errors, likely because many parents wrote the invitation themselves without including errors that would be eligible for the demand for precision coding scale. When children did make errors on the invitation, parents tended to ignore them. This may indicate that parents were more concerned with encouraging children to engage in the process of writing, rather than the accuracy of the final product itself (DeBaryshe et al., 2000). Too many corrections from parents could be interpreted as intrusive and demanding, thus impeding children's participation in the task.

Parents' level of demand for precision was not related to children's vocabulary, literacy, or fine motor skills. This finding contrasts with previous research conducted in Hebrew, which found that parents who demanded more precision in their children's writing had children with greater literacy skills (Aram 2007, 2010). This discrepancy in findings could relate to cultural (Huntsinger et al., 2000) or orthographic differences, either of which may be associated with the degree to which parents demand conventional writing products from their children. An additional consideration is that, because the writing interactions were filmed, parents may have felt less comfortable correcting children's errors, meaning that their demand for precision would have been underrepresented compared to their usual behaviors.

In the current study, most dyads (76%) opted to include the child's name on the invitation (generally as the guest of honor), which provided the opportunity to examine parents' support for both the child's name and other words. Names are personally meaningful, unchanging, and not easily forgotten; furthermore, writing one's own name conveys ownership (Levin et al., 2005). Results from the current study demonstrate that, when compared to the other types of writing completed on the invitation, parents provided a slightly higher level of graphophonemic support for name writing. More specifically, parents were more likely to say the child's name slowly and emphasize sounds or syllables, whereas when writing other words parents were more likely to simply say them at a normal speed.

Perhaps the personal significance of children's own name encouraged parents to use this slightly different approach, which entailed directing the child's attention to the sounds in the child's name. Further, families who opted to write the child's name on the invitation may have been a self-selected group who placed more importance on children being able to spell their names. In contrast, parents provided similar types of print supports, regardless of whether the child was writing his/her own name. Thus, parents may focus more on the content of the words produced and generally may not be concerned with the way in which they are formed.

Educational Implications

Writing incorporates many early literacy skills that are important for children's reading development (Levin et al., 1996), which is one reason why professionals suggest that it be incorporated into daily preschool classroom activities (Lonigan et al., 2008). Results from the current study indicate that parents may not take full advantage of writing activities to promote children's early literacy skills. Previous research suggests that helping children to link letters with their corresponding sounds benefits their literacy knowledge (Ehri et al., 2001; Ehri, 2004) and, although the current data do not lend themselves to causal conclusions, parents who provided higher levels of graphophonemic support did have children with more sophisticated literacy skills. In contrast, parents' support for physically forming letters appeared to be less important for literacy achievement, although this type of support did, not surprisingly, relate to children's fine motor skills.

Children with underdeveloped writing skills at school entry tend to face academic challenges throughout their schooling careers, making it an important instructional target during preschool (Van Luit, 2011). Writing is a personally relevant and meaningful activity that can be effectively fostered during the preschool years, particularly with caregiver assistance (Gerde, Bingham, & Wasik, 2012). Professionals should consider the utility of encouraging more joint writing activities at home, which require many of same skills as early decoding (Gerde et al., 2012). In addition, interventionists should consider whether encouraging parents to focus on the phonological concepts associated with forming words would be beneficial for preschool-aged children, as this is considered best practice in the field (Ehri, 2004).

Limitations

The children observed in the present study were predominantly European American and resided in homes with mothers who were well educated. Given the wealth of information indicating that parents use different instructional techniques (Diaz et al., 1991) and espouse different attitudes towards their children's literacy development based on their socioeconomic status (Curenton & Justice, 2008; Korat & Levin, 2001), it is unclear how results from the present study would generalize to other populations of children. There is some evidence that writing support is positively associated with maternal education (Aram & Levin, 2004), suggesting that the current study may not have captured the full range of support that parents of different backgrounds might use. Indeed, parents in this sample have been found to provide a relatively high number of home learning environment resources and activities compared to lower income samples (Hindman & Morrison, 2012). It should also

be noted that although all of the families in the current study chose to speak English during the writing interaction, a subset of them reported that English was not their native language; if English was not the language that these were most comfortable with, their writing support may have been affected. Although further research on this issue is warranted, recent research indicates similarity across cultures and alphabets in terms of how parents' support children's writing and how such support relates to children's reading and writing outcomes (Levin et al., 2013; Lin, McBride-Chang, Aram, Shu, Levin, & Cho, 2011). Overall, it is noteworthy that even in this relatively high-SES sample of families, parents used relatively low levels of writing support.

In addition, although all children had the opportunity to write the same types and amounts of letters, our writing task did not require them to write any particular letters or words. It is possible that parents and children systematically chose words that required a certain level of support, based on a factor not measured in the current study, such as child temperament. For example, children may have chosen to write words that they were familiar with, or parents may have adjusted the phrasing of the sections of the invitation. Using a task with more compositional demands may require parents to adjust to children's levels of vocabulary, producing links between support and vocabulary that were not observed in this study. Moreover, the study would have been better able to contrast parental writing support for the child's own name and other words if the task instructions had prompted each dyad to include the child's name.

Finally, this study could not make causal conclusions about the impact of parental writing support on children's emergent literacy, language, and fine motor skills. First, because information regarding children's independent writing skills was not available, it was not possible to gauge whether higher levels of writing support were equally beneficial for children at all stages of writing development. Few studies have examined parents' writing support with preschool-aged children and further research is needed to identify whether higher levels of support are uniformly beneficial for children at this age. Additional factors such as aspects of the home learning environment (beyond what was measured in this study) and children's experiences in child care or preschool would also be expected to shape these outcomes. Also, the concurrent nature of the study made it impossible to disentangle the bidirectional effects of parents and children on each other. A critical future direction will be to examine relations between parental writing support and children's literacy-related outcomes over time.

Conclusion

As writing has received increased attention from recent policy reports (Lonigan et al., 2008), it is important to understand how parents support children's participation in writing activities at home. The current study demonstrates that parents of preschoolers tend to provide low levels of support when helping their children to complete a writing task. Although these findings may be due to parents' reactions to their children's skill levels, they may also reflect parents' beliefs and knowledge about children's writing development, which could be targeted along with direct instruction to teach parents how to make the most of joint writing activities in the home.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Highlights

- We observed parents' support for preschoolers' writing during a joint writing task
- Most parents provided low-level support for children's writing
- Parents did not encourage children to choose or print letters independently
- Parents often accepted children's errors rather than asking for corrections
- Graphophonemic support predicted children's decoding and fine motor skills

Table 1
Descriptive Statistics for Parental Writing Support Variables

Variable	N	Mean(SD)	Min.	Max.
Graphophonemic	125	2.38(1.45)	1	7.71
Print	106	2.60(1.48)	1	8.33
Demand for Precision	88	1.39(0.54)	0	2.00

Note. Children who were able to write the invitation without graphophonemic ($n = 10$) or print ($n = 29$) support, respectively, were not included in these descriptive statistics. Children ($n = 47$) whose invitations did not contain any errors that were eligible for demand for precision coding were excluded from the relevant descriptives.

Table 2
Correlations between Parental Writing Support Variables and demographic variables.

	1	2	3	4	5	6
1. Graphophonemic Support	1					
2. Print Support	.568**	1				
3. Demand for Precision	.113	.084	1			
4. Age at Home Visit	.163	.055	.219*	1		
5. Maternal Education	.040	-.037	.097	.203*	1	
6. Home Learning Environment	.347**	.200	.150	.094	.078	1

Note.
* $p < .05$,
** $p < .01$.

Table 3

Descriptive Statistics for Child Background and Outcome Variables.

Variable	N	Mean(SD)	Min.	Max.
Maternal Education	119	16.10(1.78)	10	18
HLE Composite	110	3.69(0.77)	2.00	5.00
Age (at home visit)	126	4.56(0.55)	3.58	5.81
Alphabet Knowledge	124	16.27(7.99)	0	26
WJ Letter-Word	127	354.49(30.72)	264	464
WJ Picture Vocabulary	128	473.95(9.86)	447	498
WJ Sound Awareness	128	450.79(18.65)	420	496
Fine Motor Skills	118	11.06(2.34)	3	14

Note. HLE = Home Learning Environment

Raw and standardized regression path coefficients for path models using parent writing support to predict children's literacy, language, and fine motor skills.

Table 4

Model and Predictors	Fine Motor			Decoding			Vocabulary			Sound Awareness			Alphabet		
	B	SE	β	B	SE	β	B	SE	β	B	SE	β	B	SE	β
Graphophonemic Support ($n = 125$)															
Dummy 2	0.86	0.59	.12	-1.57	8.33	-.02	-4.54	2.65	-.15 ⁺	2.69	4.84	.05	-0.91	1.94	-.04
Dummy 3	1.79	1.03	.14 ⁺	29.50	14.53	.17 [*]	4.26	4.63	.08	13.59	8.44	.13	5.12	3.38	.12
Dummy 4	1.00	0.40	.20 [*]	10.15	5.72	.15 ⁺	-0.11	1.82	-.01	3.33	3.32	.08	2.08	1.42	.13
Age at Assessment				21.10	4.72	.37 [*]	7.20	1.50	.40 [*]	14.58	2.74	.43 [*]	6.26	1.10	.44 [*]
Age at Home Visit	2.13	0.33	.51 [*]												
Maternal Education										1.57	0.73	.14 [*]	0.57	0.29	.12 [*]
HLE										1.77	0.73	.18 [*]			
Print Support ($n = 106$)															
Print Support	0.94	0.54	.15 ⁺	-1.39	6.64	-.02	1.81	2.34	.07	1.20	4.30	.03	-1.29	1.83	-.06
Age at Assessment				18.96	4.53	.38 [*]	6.88	1.60	.39 [*]	13.16	2.94	.41 [*]	6.42	1.21	.46 [*]
Age at Home Visit	2.25	0.36	.54 [*]												
Child Race															
HLE				-17.89	7.60	-.16 [*]				2.20	0.77	.22 [*]			
Demand for Precision ($n = 88$)															
Demand for Precision	-0.12	0.54	-.02	8.97	8.26	.11	-0.75	2.52	-.03	1.09	4.26	.02	-0.76	1.58	-.04
Age at Assessment				24.13	6.72	.36 [*]	7.27	2.05	.36 [*]	19.51	3.47	.52 [*]	6.90	1.28	.49 [*]
Age at Home Visit	1.81	0.43	.43 [*]										0.81	0.32	.20 [*]
Maternal Education													1.46	0.74	.16 [*]
HLE															

Note.

* $p < .05$,

+ $p < .10$.

HLE = Home Learning Environment composite score. The reference group for the graphophonemic support dummy variables is category one. Non-significant covariate paths were trimmed from the models.