

**THE RELATIONSHIP BETWEEN HOME LITERACY EXPERIENCES AND
PRESCHOOL EMERGENT WRITING SKILLS**

by

Erin Estabrook

B.A. Communication Science and Disorders, University of Pittsburgh, 2011

Submitted to the Graduate Faculty of
University of Pittsburgh in partial fulfillment
of the requirements for the degree of
M.S. in Speech-Language Pathology

University of Pittsburgh

2013

UNIVERSITY OF PITTSBURGH
School of Health and Rehabilitation

This thesis was presented

by

Erin Estabrook

It was defended on

March 27, 2013

and approved by

Patricia Crawford, PhD., Associate Professor, Department of Instruction and Learning,
University of Pittsburgh

Cynthia Puranik, PhD., Assistant Professor, Department of Communication Science and
Disorders, University of Pittsburgh

J. Scott Yaruss, PhD., Associate Professor, Department of Communication Science and
Disorders, University of Pittsburgh

Thesis Director: Cynthia Puranik, PhD., Assistant Professor, Department of Communication
Science and Disorders, University of Pittsburgh

Copyright © by Erin Estabrook

2013

THE RELATIONSHIP BETWEEN HOME LITERACY EXPERIENCES AND PRESCHOOL EMERGENT WRITING SKILLS

Erin Estabrook, M.S.

University of Pittsburgh, 2013

A substantial body of research documents that children's home literacy environment plays an important role in the development of oral language and emergent reading skills (Dickinson & DeTemple, 1998; Foy & Mann, 2003; Frijters, Barron, & Brunello, 2000; Hood, Conlon, & Andrews, 2008; Payne, Whitehurst, & Angell, 1994; Roberts, Jurgens, & Burchinal, 2005; Senechal & LeFevre, 2002; Senechal, LeFevre, Thomas, & Daley, 1998) However, few researchers have investigated the relationship between home literacy environment and the development of writing skills, which are crucial to academic success. The goal of this study is to examine the relationship between home literacy experiences and emergent writing in preschool children.

Home literacy surveys from 231 families were analyzed. Based on extant research, home literacy experiences were categorized as independent, shared, and casual. Emergent writing skills were measured by performance on letter writing, name writing, and spelling tasks. Data were analyzed using Spearman's Rho correlations and multi-variate regression. Post-hoc descriptive analysis of independent activities was also performed.

Results of the correlational analysis indicated that there was a significant positive correlation between independent home literacy activities and all emergent writing tasks. Shared and casual HLE were significantly correlated with letter writing and spelling scores. The

regression analysis also showed that independent HLE accounted for a significant additional amount of the variance on two of the three emergent writing tasks (2.6% for letter writing, and 3.5% for name writing) after accounting for control variables. Shared and casual HLE did not contribute a significant amount of the variance for any of the writing outcomes. Control variables, including cognitive abilities and maternal level of education contributed a significant proportion to the variance to all three writing tasks (20.2% for letter writing, 30.5% for name writing, and 17.1% for spelling). The findings of the current study suggest that home experiences play an important role in the development of writing skills. Whereas parental involvement is necessary, it appears that the encouragement of independent practice is particularly important for writing.

TABLE OF CONTENTS

1.0 INTRODUCTION.....	1
1.1 EMERGENT LITERACY- THE FOUNDATION OF CONVENTIONAL READING AND WRITING	2
1.1.1 Oral language	2
1.1.2 Print concepts	3
1.1.3 Alphabet knowledge.....	3
1.1.4 Phonological awareness	4
1.1.5 Emergent writing	4
1.1.5.1 Letter writing	5
1.1.5.2 Name writing.....	5
1.1.5.3 Spelling.....	6
1.2 HOME LITERACY ENVIRONMENTS (HLE)	6
1.3 THE ROLE OF HOME LITERACY ENVIRONMENT AND ORAL LANGUAGE.....	7
1.4 THE ROLE OF HOME LITERACY ENVIRONMENT AND READING.....	9
1.5 THE ROLE OF HOME LITERACY ENVIRONMENT AND WRITING.....	11
1.6 VARIATIONS IN HOME LITERACY ENVIRONMENTS	12
1.6.1 Formal vs. Informal Interactions	12

1.6.2	Family Characteristics.....	15
1.7	IMPACT OF POOR LITERACY OUTCOMES	17
1.8	AIMS.....	18
2.0	METHODS	20
2.1	PROCEDURE.....	20
2.2	PARTICIPANTS	20
2.3	MATERIALS.....	21
2.3.1	Home Literacy Questionnaire.....	21
2.3.2	Emergent Writing Measures.....	22
2.3.2.1	Letter Writing	22
2.3.2.2	Name Writing.....	22
2.3.2.3	Spelling.....	23
2.3.3	The Wechsler Preschool and Primary Scale of Intelligence.....	23
3.0	RESULTS	24
3.1	DEMOGRAPHIC INFORMATION.....	24
3.2	PERFORMANCE ON WRITING TASKS.....	27
3.3	RELATIONSHIP BETWEEN HLE AND WRITING OUTCOMES	30
3.4	PREDICTIVE VALUE OF HLE ON WRITING OUTCOMES.....	31
3.4.1	Predictive value of HLE for letter writing.....	32
3.4.2	Predictive value of HLE for name writing.....	34
3.4.3	Predictive value of HLE for spelling	36
3.5	POST-HOC ANALYSIS OF INDEPENDENT HLE.....	38
4.0	DISCUSSION.....	45

4.1 LIMITATIONS.....	48
4.2 IMPLICATIONS AND FUTURE RESEARCH.....	49
APPENDIX A. THE HOME LITERACY QUESTIONNAIRE.....	51
APPENDIX B. SCORING OF WRITING TASKS	55
BIBLIOGRAPHY	58

LIST OF TABLES

Table 1. Participant Demographics.....	25
Table 2. Descriptive Statistics on Emergent Writing Measures	29
Table 3. Correlations between control variables, HLE, and writing outcomes.....	31
Table 4. Predictors of Preschool Letter Writing.....	33
Table 5. Predictors of Preschool Name Writing.....	35
Table 6. Predictors of Preschool Spelling.....	37
Table 7. Scoring of Letter Writing.....	54
Table 8. Scoring of Name Writing.....	55
Table 9. Scoring of Spelling.....	56

LIST OF FIGURES

Figure 1. Frequency of independent writing of names and words and letter writing performance.....	39
Figure 2. Frequency of independent writing of names and words and name writing performance.....	40
Figure 3. Frequency of independent writing of names and words and spelling performance.....	41
Figure 4. Mean letter writing performance based on who initiated the writing activity.....	42
Figure 5. Mean name writing performance based on who initiated the writing activity.....	43
Figure 6. Mean spelling performance based on who initiated the writing activity.....	44

1.0 INTRODUCTION

The term *emergent literacy* is used to describe a broad range of preliteracy skills, knowledge, and attitudes that children acquire prior to formal schooling and before they exhibit conventional ways of reading and writing (Mason & Stewart, 1990; Sulzby, 1989; Sulzby & Teale, 1991; Whitehurst & Lonigan, 1998; Whitehurst & Lonigan, 2001). These emergent literacy skills include code-related skills (print concepts, alphabet knowledge, and phonological processing) and oral language skills.

A substantial body of research documents that children's home literacy environment plays an important role in the development of emergent literacy skills (Dickinson & DeTemple, 1998; Foy & Mann, 2003; Hood, Conlon, & Andrews, 2008; Payne, Whitehurst, & Angell, 1994; Roberts, Jurgens, & Burchinal, 2005; Senechal & LeFevre, 2002; Senechal, LeFevre, Thomas, & Daley, 1998). A significant portion of the literature describes the relationship between home literacy environments and oral language skills, such as vocabulary (Frijters, Barron, & Brunello, 2000; Hood, et al., 2008; Payne, et al., 1994). Another major focus of the research in this area has been on reading development and how home literacy environments affect conventional reading skills (Foy & Mann, 2003; Hood, et al., 2008; Roberts, et al., 2005). However, few researchers have investigated the relationship between home literacy environment and the development of writing skills, which are crucial to academic success. The goal of this study is to examine the relationship between home literacy experiences and emergent writing.

1.1 EMERGENT LITERACY- THE FOUNDATION OF CONVENTIONAL READING AND WRITING

Literacy skills, which include reading and writing, are key to academic success, as well as, serve functional purposes in everyday life. Unlike spoken language, knowledge of written language needs to be taught explicitly before competent skills are developed. Research in the last four decades has shown however, that before formal instruction begins, certain emergent literacy skills need to be in place. Although researchers use different classification systems and terminology, most models of emergent literacy include key skills in the areas of oral language (e.g. vocabulary, syntactic awareness, and narrative skills) and code-related skills. Code-related skills that have been identified as being important for the development of emergent literacy include, concepts about print (e.g., knowledge about the functions of print, reading in context), alphabet knowledge (e.g., letter name and letter sound knowledge), and phonological awareness (e.g., the ability to think discriminate, think about, and manipulate sounds), (Adams, 1990; Sulzby, 1989; Teale & Sulzby, 1986; Wagner, Torgesen, & Rashotte, 1994; Whitehurst & Lonigan, 1998).

1.1.1 Oral language

Oral language skills that have been shown to be important for the development of literacy include vocabulary, syntactic knowledge, and, narrative comprehension (Whitehurst & Lonigan, 1998). Vocabulary knowledge facilitates comprehension of what is read and may even assist children to read words when they have difficulty decoding. Syntactic knowledge is another oral language skill that appears to support the development of reading. Syntactic knowledge promotes

the use and comprehension of complex sentence composition and appears to be important for both emergent and conventional reading skills. Finally, oral language skills promote children's understanding of narratives and text consisting of decontextualized language (Dickinson & Snow, 1987; Whitehurst & Lonigan, 1998).

1.1.2 Print concepts

Print concepts reflect children's knowledge about print such as knowledge that the print on a page represents the meanings of words rather than pictures or other features of a book (Whitehurst & Lonigan, 1998). Print concepts also include children's understanding of the conventions of print, such as left-to right and top-to-bottom orientation of print, understanding the difference between a cover of a book and a page, and recognizing punctuation and spacing between words and sentences (Clay, 1979). In addition to its contribution to reading, print concepts have been shown to contribute to the development of early writing skills including, letter writing, name writing, and spelling (Blair & Savage, 2006; Bloodgood, 1999; Lonigan, Schatschneider, & Westburg, 2008; Puranik, Lonigan, & Kim, 2011).

1.1.3 Alphabet knowledge

Alphabet knowledge is another important skill children need to learn before reading or writing (Whitehurst & Lonigan, 1998). This includes knowledge of the letter names and the corresponding letter sounds. A large body of research has demonstrated that alphabet knowledge is one of the best predictors of reading and spelling (Adams, 1990; Moats, 2005; Stevenson & Newman, 1986; Treiman, 2006). Alphabet knowledge's impact also extends to early writing

activities such as letter writing, name writing, and spelling (Puranik, et al., 2011). Without alphabet knowledge, decoding written words or writing them would not be possible.

1.1.4 Phonological awareness

Phonological awareness is the ability to manipulate sounds in words which promotes understanding of the grapheme-phoneme relationship (Wagner, et al., 1994; Whitehurst & Lonigan, 1998). Phonological awareness is necessary to understand how language is organized to express meaning at the very smallest level, the phoneme (Whitehurst & Lonigan, 1998). Early literacy skills including reading, name writing, and spelling are all impacted by phonological awareness (Puranik, et al., 2011; Stanovich, 1986) and it has been shown as an accurate predictor of reading disabilities (Stanovich, 1986).

1.1.5 Emergent writing

Unlike emergent reading, the literature on emergent writing is less well developed. However, it is becoming increasingly evident that preschool children display the ability to write, starting with scribbling and drawing, eventually evolving to writing conventional letters, their own names, and words. Children's early writing shows evidence of universal (linearity, discreteness, and lack of iconicity) and language specific (directionality, symbol shapes, and spacing between words) features that children must understand before composing written language on their own (Ferreiro & Teberosky, 1982; Tolchinsky, 2003). These features begin to emerge as children experiment with writing and attempt to convey meaning through drawings and scribbles.

Research had documented that children are able to gather and apply information about writing prior to formal schooling. Puranik and Lonigan (2009) studied 372 children ranging in age from three to five years old in order to further understand the development of writing in young children. Children were individually given a battery of tests, which included a letter writing task, a spelling task, a sentence retell task, and a picture description task. A comprehensive scoring system was used in order to capture the specifics of developing writing, i.e., universal and language-specific features. Results showed that children differed significantly on each writing task based on their age. Although a vast majority of the children could not write conventionally, their early written output showed evidence of writing features suggesting that as children progress through the preschool years, they grow increasingly comfortable and competent with writing even before formal instruction. Starting as early as preschool, children engage in a variety of writing activities. Some of these writing activities are described below.

1.1.5.1 Letter writing The ability to write letters of the alphabet is a crucial tool a child must master in order to express her or himself through writing. Letter writing reflects children's growing knowledge of orthographic awareness (Puranik & Apel, 2010; Puranik, et al., 2011; Ritchey, 2008). Research with older children indicates that letter writing fluency accounts for a substantial proportion of variance to children's ability to compose text (Graham, Berninger, Abbott, Abbott, & Whitaker, 1997). Thus letter-writing skills appear to be one of the building blocks of learning to write.

1.1.5.2 Name Writing Name writing is a task commonly used to assess developing writing skills due to the fact that personal names are among the first things children write (Both-de Vries & Bus, 2008, 2012; Clay, 1975; Martens, 1999). Written forms of one's name can be perceived as

personal possessions and are a source of pride for children (Ferreiro, 1986; McGee & Richgels, 1989). These personal feelings promote interest and active exploration of written language (Bloodgood, 1999; Ferreiro & Teberosky, 1982).

1.1.5.3 Spelling Spelling skills are a crucial component of proficient writing ability and academic success. The knowledge of the rules and patterns that dictate conventional spelling comes from a child's experience with print, as well as, direct instruction (Treiman & Bourassa, 2000). Spelling and reading have been shown to be closely related, both drawing on emergent literacy concepts and the ability to utilize working memory (Ehri, 2000). Research has shown that spelling skills, as measured in kindergarten and first grade are good predictors of current and later developing reading abilities (McBride-Chang, 1998; Richgels, 1995; Stage & Wagner, 1992).

1.2 HOME LITERACY ENVIRONMENTS (HLE)

Home environment and experiences are considered to be important building blocks for children's subsequent language, cognitive, and academic development (Bradley, Corwyn, Burchinal, McAdoo, & Garcia Coll, 2001; Bradley, Corwyn, McAdoo, & Garcia Coll, 2001; National Institute of Child Health and Human Development, 2000, 2002). Even during infancy, measures of stimulation in home environments correlate with intelligence scales and mental development measures (Elardo, Bradley, & Caldwell, 1975). Experiences focused on literacy activities contribute to an enriching home environment, which facilitates both oral language and literacy development in young children (Dickinson & DeTemple, 1998; Foy & Mann, 2003; Hood, et al.,

2008; Payne, et al., 1994; Roberts, et al., 2005; Senechal & LeFevre, 2002; Senechal, et al., 1998). These parent/caretaker and child shared experiences can begin very early in life, before formal schooling begins, and can continue through the school-age years.

1.3 THE ROLE OF HOME LITERACY ENVIRONMENT AND ORAL LANGUAGE

Research indicates that HLE impacts oral language during the preschool years (Frijters, et al., 2000; Hood, et al., 2008; Payne, et al., 1994). Frijters, et al. (2000) examined home literacy experiences in a sample of 95 children ranging in ages from 63-76 months. They compared parent responses on a five-item home literacy questionnaire measuring the frequency of reading related activities and a storybook title recognition checklist to child scores on measures of early literacy and receptive vocabulary. These authors also examined the child's interest in literacy activities and compared them to measures of oral and written language. Home literacy experiences and the child's level of interest in these activities were examined together as predictors of literacy outcomes; they accounted for 21% of the variance in Peabody Picture Vocabulary Test-Revised (PPVT-R; Dunn & Dunn, 1981) scores.

The relationship between home literacy environment and oral language outcomes extends to families with lower levels of income. Payne, A. C., Whitehurst, G. J., Angell, A. L. (1994) performed an in depth analysis of expressive and receptive vocabulary measures in comparison to a comprehensive measurement of early home literacy environments for 323 four year-olds from low income families. Home literacy environments were evaluated using the Stony Brook Family Reading Survey (Whitehurst, 1992), which consisted of 52 questions targeting family variables, nine of which focused on literacy in the home. These responses were then compared to

the children's scores on the PPVT-R, (Dunn & Dunn, 1981) and the Expressive One Word Picture Vocabulary Test (Gardner, 1981) which were given within one month of survey completion. Using canonical correlation, which produces weights for each of home literacy variables based on each individual variable's estimated contribution to literacy outcomes and creates a weighted sum, the authors found that 18.5% of the variance in child's receptive and expressive vocabulary scores were accounted for by the home literacy variables. When the effects of primary caregiver IQ and education level were partialled out, the relationship between HLE and child language scores was still significant with home literacy accounting for 12% of the variance in language scores.

Not only have the findings of various studies shown that home literacy environments contribute to children's oral language from low and middle-income families in the United States, but this finding also appears to hold in other countries. Hood, Conlon, & Andrews (2008) performed a study to examine the relationship between HLE and early language and literacy skills, such as receptive vocabulary. A title recognition test and home literacy environment questionnaire was completed by parents to evaluate the home literacy environment of 143 children in Australia. The authors used the PPVT-R to evaluate receptive vocabulary. Researchers found that shared book reading accounted for 5.6% of the variance in vocabulary scores. No other variables appeared to mediate this relationship, suggesting a direct relationship between shared book reading and vocabulary development. Teaching practices of parents were also examined and it was found that a significant but indirect relationship existed between parental teaching practices and vocabulary, mediated by preschool letter-word identification. This relationship accounted for 4.6% of the variance in PPVT-R scores. Other early literacy

skills found to be related to home literacy environment from this study will be discussed in the next section

1.4 THE ROLE OF HOME LITERACY ENVIRONMENT AND READING

Similar to examining the influence of HLE on oral language, researchers have also investigated the influence of HLE on the development of reading skills. Foy and Mann (2003) performed a study that examined the relationship between HLE, measures of phonological awareness and early reading skills, such as word identification and decoding, in 40 middle-class children from California. Home literacy environment was measured through parental reports of storybook exposure, parent familiarity with children's books from a list containing various foils, parent responses about their own reading habits, parent teaching habits, and children's exposure to reading media. They found that HLE played both a direct and indirect role in phonological awareness and letter knowledge. Their analyses of the various links between home literacy measures and reading related measures showed that phoneme awareness was indirectly related to reading outcomes through vocabulary and letter knowledge. However, they did not find significant correlations between home literacy experiences and early reading ability, suggesting that within this sample, the home environment played a larger role in facilitating emergent reading skills rather than conventional reading skills.

Similar results were reported by Hood, Conlon, and Andrews (2008) who examined parent interactions and their relationship to early literacy skills in 143 children from Australia. Parents completed a home literacy questionnaire and a title recognition test at the beginning of their child's fourth term of preschool. At the same time, children completed the letter-word

identification subtest from the Woodcock Diagnostic Reading Battery (Woodcock, 1997) a one-minute reading fluency task of common words. Phonological awareness was assessed with the Rhymes subtest of the Cognitive Profiling System (Singleton, Thomas, & Leedale, 1997), as well as, the Phonemic Segmentation subtest of the Dyslexia Early Screening Test (Fawcett & Nicolson, 1996). Researchers found that first and second grade letter-word identification, reading rate, and phonological awareness are mediated by preschool letter-word identification and phonological awareness. Preschool letter-word identification was both directly and indirectly related to different types of parental interactions, while preschool phonological awareness was related to and mediated the development of letter and word identification skills.

Roberts, Jurgens, and Burchinal (2005) examined the relationship between an overall measure of home environment and early reading skills from a sample of 72 African-American children, ages three-five years old. Home literacy information was gathered using a home literacy questionnaire and the Home Observation for Measurement of the Environment Inventory (HOME), a measure of overall responsiveness of the home environment, which focuses on features like emotional and verbal responsivity, acceptance of child's behavior, organization of environment, academic and language stimulation, and maternal involvement. Comparisons were made with the children's scores on the Test of Early Reading Ability (TERA; (Reid, Hresko, & Hammil, 1981), which was administered when the children were four years old and at the beginning of kindergarten. Results demonstrated that the HOME showed significant correlations with TERA scores at both four years of age and at kindergarten entry ($r = .48$ and $.43$ respectively), as well as, all other measures of receptive and expressive language and vocabulary.

1.5 THE ROLE OF HOME LITERACY ENVIRONMENT AND WRITING

Since reading and writing are components of written language and share a reciprocal relationship (Ehri, 2000; Shanahan, 2006; Shanahan & Lomax, 1986), many of the foundational skills that support emergent reading are likely to support early writing. In order to better understand the long term effects of parent teaching and home literacy environments in preschool on writing outcomes, Hood et al. (2008) examined spelling rate in their sample of 143 first and second grade children in Australia. Spelling rate was assessed through a task requiring the children to write as many words as they could in two minutes presented orally by the experimenter. Results showed spelling rate was affected by letter-word identification abilities in preschool, which was directly mediated by parental teaching in the home during the preschool years. This finding suggests that emergent and conventional writing skills may be impacted by home literacy experiences in ways comparable to oral language and reading skills. However, by only measuring the rate in which the child could perform a single writing task, the full extent and strength of this relationship remains undocumented.

Unlike the substantial body of research that has focused on examining the effect of HLE on reading, there has been less investigation into the effect of HLE and the development of various writing skills.

1.6 VARIATIONS IN HOME LITERACY ENVIRONMENTS

1.6.1 Formal vs. Informal Interactions

Research indicates that the types of HLE that facilitate oral and written, specifically reading skills, differ. Precursors needed for oral and written language development vary; suggesting that the types of experiences children are engaged in may have different effects on their development (Hood, et al., 2008; Senechal & LeFevre, 2002; Senechal, et al., 1998). Typically, researchers have differentiated between home literacy activities based on their level of formality. Informal activities include shared book reading and playing literacy related games. Formal activities, however, involve greater levels of parental support and structured teaching of literacy skills.

To better understand the differential impact formal and informal interactions have on oral and written language outcomes, Senechal, LeFevre, Thomas, and Daley (1998) compared the effects of the informal interaction, storybook reading, and a formal interaction, parental teaching, on literacy outcomes. At the beginning of the study, parents completed a questionnaire that described their children's experiences with books. These indicators were the frequency of storybook reading in a typical week, the frequency with which the child requested storybook reading, the frequency of library visits, the number of children's books in the home, and the age when the parent began reading to the child. Parents' knowledge of children's books was also assessed through recognition checklists with 40 titles of popular books and 20 titles that do not exist. A similar checklist was given to assess familiarity with children's author names. Parent teaching was also measured through parental questionnaire, which asked parents to record the frequency in which they taught their child to read and write, each on a 5-point scale. In kindergarten, children's oral language skills were measured in terms of vocabulary, listening

comprehension, and phonological awareness. Vocabulary was assessed with the PPVT-R (Dunn & Dunn, 1981) where children were asked to point to a picture of a spoken word among four options. Listening comprehension was assessed with the Listening to Stories subtest of the Stanford Early School Achievement Test (3rd ed., 1989) where children listened to 30 short stories between 1-5 sentences and asked comprehension questions which could be answered by pointing to one of three pictures. Phonological awareness was assessed with the Sounds and Letters subtest of the Stanford Early School Achievement Test (3rd ed., 1989) where children were asked to point to pictures with matching onsets and rimes of target spoken words. In kindergarten, children's written language skills were measured in terms of print concepts, alphabet knowledge, invented spelling, and decoding. In first grade, children's reading ability was assessed using the Reading Vocabulary subtest of the Gates-MacGinitie Reading Tests (Level A, Form 3). Control variables included children's analytic intelligence and parent's exposure to print which were examined using the Animal House subtest of the Wechsler Preschool and Primary Scale of Intelligence-Revised or WPPSI-R (Wechsler, 1989) and an Adult Author Recognition test, respectively. Storybook exposure accounted for a statistically significant 2% of the variance of children's oral language factor, while parent teaching accounted for a statistically significant 7% of the variance in children's written language scores. These findings support the hypothesis that formal and informal home literacy activities affect emergent literacy skills differently. The authors suggest that these experiences cannot be considered as a unitary construct and that various aspects of parent-child interactions need to be studied separately to determine specific links to early language and literacy skills (Senechal, et al., 1998).

Senechal and LeFevre (2002) followed these same children for five years to examine the long-term effects of HLE on the development of language and literacy skill. Their focus was on reading skills and the pathways from which children move from early knowledge and experiences to fluent reading. They continued to assess children's receptive language, emergent literacy, and analytic intelligence. Clear links between home experiences through early literacy skills and finally to fluent reading were found. Specifically, storybook reading appeared to influence children's receptive language development while parent teaching had a greater effect on children's early literacy skills. Although phonological awareness was not directly related to home literacy experiences, it was related to both receptive language and emergent literacy development and appeared to mediate the relationship between language and literacy skills. Reading outcomes at the end of first grade were related to emergent literacy skills, but not receptive language. However, at the end of third grade, both emergent literacy and language abilities were predictive of reading outcomes. Within this study informal activities, such as storybook reading, were not sufficient in the promotion of children's early literacy skills that lead to successful reading in elementary school. Parent teaching, however, had more direct effects on participants' reading skills.

The importance of parental teaching was also documented by Hood, et al. (2008) who examined the differences between parent-child shared book reading and parent teaching on literacy outcomes. The results of their study indicated that parent teaching plays a more important role in letter-word identification, which mediates the relationship between home experiences and literacy outcomes, such as more advanced letter-word identification, reading rate, and spelling rate. Shared book reading played a more significant role in the development of receptive vocabulary, which also mediates letter-word identification.

1.6.2 Family Characteristics

In addition to activities that parents engage in, researchers have also examined various family characteristics in an attempt to understand their relationship to language and literacy outcomes. Family characteristics that have been suggested as potential predictors of the quality of the HLE are socioeconomic status, caregiver IQ, and caregiver level of education.

Research has found differences in the quality of home literacy environments based on socioeconomic status. Aram and Levin (2001) performed a study with forty-one children from low socioeconomic groups to examine the relationship between SES and literacy outcomes, which included word writing, word recognition, phonological awareness, and orthographic awareness. They found that SES, assessed based on measures of parental education, vocation, occupation, and residential area contributed 21% of the variance to word writing and recognition measures and 19% of the variance to orthographic awareness measures.

However, it has also been documented that within low socioeconomic groups, there can be a wide variety of home literacy activities, which promote language and literacy outcomes. Payne, Whitehurst, & Angell (1994) determined from a large sample of low socioeconomic families, primary caregiver IQ and education accounted for only 5% of the variance in children's receptive and expressive language scores. However, when both caregiver IQ and education had been accounted for, 12.0% of the variation in language scores was attributed to home literacy environments. These results suggest that families with fewer resources still provide home literacy environments that promote language development in their children.

Whereas SES is related to differences in literacy outcomes, research also indicates that between socioeconomic groups, the frequencies of different types of literacy activities vary. Phillips and Lonigan (2009) performed a large scale cluster analysis with 1,044 children from a

wide variety of socioeconomic backgrounds. Home literacy surveys were completed by primary caregivers and responses analyzed based on the frequency of activities described as outside-in or inside-out. As defined by Whitehurst and Lonigan (1998), outside-in skills include vocabulary, narrative understanding, and reading comprehension. In contrast, inside-out activities are code-based instructions that promote emergent literacy skills, including alphabet knowledge and phonological awareness. Phillips and Lonigan (2009) defined outside-in activities as shared-book reading, child observations of parental literacy activities, or the child's independent book reading, whereas inside-out activities included pointing out words, playing rhyming or alphabet games, and teaching the alphabet directly. These categories were based on research suggesting outside-in and inside-out skills are promoted by different types of home literacy activities (Senechal & LeFevre, 2002; Senechal, et al., 1998). Their results suggested the presence of three distinct clusters, those families who provide low frequencies of outside-in and inside-out activities, those who reported high frequencies of outside-in and inside-out activities, and finally a cluster of families who partake in low frequencies of outside-in activities and high frequencies of inside-out activities. Differences between these clusters were determined to be significantly associated with socioeconomic status, as defined by maternal education and household income. Families from high levels of SES were primarily included in the cluster that provided high frequencies of both outside-in and inside-out literacy activities. It was found that the cluster with the lowest levels of socioeconomic status were those who provided low frequencies of outside-in activities and high levels of inside-out activities. This research suggests that socioeconomic status is an important variable for children's literacy outcomes.

1.7 IMPACT OF POOR LITERACY OUTCOMES

Children with reading deficits fall behind their peers at an early age and these deficits in turn continually prevent children from participating in reading-related learning experiences throughout the school years, (Juel, 1988; Stanovich, 1986). These early deficits may also cause children to foster negative attitudes towards reading, which only increase the likelihood that they will avoid key opportunities in their education. Longitudinal studies that examined the relationship between preschool emergent literacy skills and later reading abilities have demonstrated that children who enter school with lower levels of emergent literacy skills are more likely to struggle with reading in school (Scarborough, 1998, 2001). Therefore, the development of reading is essential in promoting children's education and the encouragement of these skills in the home may be an important way to prevent potential deficits.

The National Commission on Writing (2005; 2004) documented that the importance of writing in the workplace, stating that the majority of both public and private employers consider writing proficiency to be directly related to hiring and promotion of employees. These writing skills range from written reports, visual presentations, to electronic messages and require advanced and flexible writing abilities to meet the needs of employers.

The long-term consequences of poor literacy, both reading and writing outcomes, are bleak. Whereas, we have learned a substantial amount regarding how HLE affects reading outcomes, we need to understand how home literacy environment facilitates or promotes early writing in order to prevent the consequences of poor literacy.

1.8 AIMS

The aim of the current study is to examine the relationship between home literacy experiences and the development of writing in preschool children. Specifically, the goal was to examine different types of HLE to determine if they have a differential effect on writing. Based on research that suggests that different types of interactions affect emergent literacy skills differently (Hood, et al., 2008; Senechal & LeFevre, 2002; Senechal, et al., 1998), this study defined interactions as shared, independent, or casual home literacy activity. Shared activities were defined as activities where children and parents worked together on writing tasks or games, and are related to the formal interactions described previously in the literature (Senechal & LeFevre, 2002; Senechal, et al., 1998). Independent activities were defined as activities in which the child engaged in writing tasks or games on his own, with no assistance from a parent. Casual activities were defined as addressing the importance of print in the environment or the frequency in which the child observes a parent interacting with print. These are related to the informal interaction described previously in the literature (Senechal & LeFevre, 2002; Senechal, et al., 1998).

Based on research documenting the differential effects of formal and informal home literacy activities on emergent literacy, the researcher for the current study hypothesized that writing outcomes will be significantly influenced by parent-child interactions involving parental teaching. It is hypothesized that child-initiated, independent writing activities will be better predictors of writing outcome variables than shared or casual home literacy experiences. It has been shown that the level of child autonomy allowed during interactions is important to literacy outcomes (Aram & Levin, 2001), however, perhaps greater differential effects may be seen for completely independent writing activities. Perhaps, when a child enjoys writing activities, he or

she will be more motivated to practice without parental encouragement, providing these children the opportunity to hone their writing skills before they enter kindergarten.

Investigation into the home literacy experiences of 231 children will be compared to scores on emergent writing tasks including letter writing, name writing, and spelling. A better understanding of the connection between these variables will support parents, clinicians, and teachers, by more accurately describing the type of environment that promotes writing development before instruction begins in school.

2.0 METHODS

2.1 PROCEDURE

Data sets collected during May-July 2010 were provided to the researcher for analysis. Data for this study was collected as a part of a larger study whose primary aim was the assessment of emergent writing skills. Home literacy surveys were distributed to 367 families who participated in the larger study. Surveys from 231 of these families were returned and used for the current study. The assessment battery included instruments to measure oral language, cognition, emergent reading, and emergent writing. These assessments used in the analysis for the current study are described below. Institutional Review Board permission was obtained for the original study, as well as the current study.

2.2 PARTICIPANTS

Participants for this study included 367 preschool children who were recruited from 54 preschool or daycare programs located in mid-sized cities in Pennsylvania and Florida. First, consent was obtained from all participating preschool programs. Next, parental consent was obtained for all participating children through their classroom teachers. Home literacy surveys were sent home with the children following the administration of assessments. Teachers or preschool directors

collected responses and returned them to the research facility. Two-hundred and thirty-one parents completed and returned the home literacy surveys.

2.3 MATERIALS

2.3.1 Home Literacy Questionnaire

Parents completed a survey documenting the home literacy experiences of their children. In addition, the questionnaire, included items regarding demographic information, family income, level of education achieved by both parents/caretakers, occupation of parents/caretakers, native language, child's personality, and home literacy experiences. The HLE survey used is included in Appendix A.

Eleven questions focused on literacy experiences that range from informal writing activities to formal teaching practices and parents were instructed to rate the frequency with which they and/or their children engaged in these activities. Independent activities were targeted with the following questions, "How often does your child work alone on writing letters of the alphabet?" and "How often does your child attempt to write names or words independently?" The questions that targeted shared home literacy activities included, "How often do you help your child with learning letters of the alphabet?" "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?" "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?" Casual home literacy experiences were targeted with the questions, "How often does your child play

alphabet games?” “How often is print in the environment pointed out to your child?” “ How often does your child use a computer for literacy related activities?” and “How often does your child observe a parent on the computer?”

2.3.2 Emergent Writing Measures

Various writing tasks were included in the assessment battery. These measures are described below.

2.3.2.1 Letter Writing For this task, children were asked to write all 26 uppercase letters of the alphabet. The examiner presented the letters in a random order. Children’s written productions were scored on a scale from 0-2. A score of 0 was given to responses that were unrecognizable or an incorrect letter. A score of 1 was given to responses that were poorly formed or written in lowercase. A score of 2 was given to well-formed uppercase letters. (Scoring examples are shown in Table 7).

2.3.2.2 Name Writing In the name-writing task, children were required to write their first names. Name writing was scored for the absence or presence of a variety of developmental features such as linearity, segmentation of units, left-to-right orientation, the production of simple units or complex characters, the use of conventional symbols, writing the first letter of the name, producing pseudo or random letters after the correct first letter, and eventually conventional spelling. (Scoring examples are shown in Table 8).

2.3.2.3 Spelling For the spelling task required children were asked to spell eight simple consonant-vowel-consonant words. Responses were scored on a 0-9 scale to account for levels of development from scribbling to phonetic representations to invented spelling and finally, conventional spelling. (Scoring examples are shown in Table 9).

2.3.3 The Wechsler Preschool and Primary Scale of Intelligence

Research has suggested that differences in cognitive abilities may affect the results of literacy tasks (Ehri, 2000; Whitehurst & Lonigan, 1998), hence it is common practice to control for cognitive factors when examining literacy outcomes. The Wechsler Preschool and Primary Scale of Intelligence- Third Edition (Wechsler, 2002) was created to be a clinical tool measuring intelligence in children 2 years 6 months to 7 years 3 months. The WPPSI-III contains 14 subtests each designed to target different areas of cognition. The Block Design and Matrix Reasoning subtests were administered to participants in this study.

The Block Design subtest requires children to construct a design based on an examiner model or picture. Blocks with two colors on each side are introduced as the tasks increases in difficulty. Testing is complete when the child is unable to correctly re-create three consecutive designs.

The Matrix Reasoning subtest requires the child to complete a matrix of related pictures from a field of four or five options. Two sample items are included in order to ensure the child understands the task. Testing is complete when the child is unable to correctly complete four consecutive matrices, or if the child is unable to complete four out of five matrices.

3.0 RESULTS

3.1 DEMOGRAPHIC INFORMATION

Two hundred and thirty one surveys were completed and returned by the parents and caretakers of the participants. The mean age of the participants was 53.2 months ($SD = 8.96$). Of these participants, 53.2% were female and 46.8% were male. The majority of participants were reported to be white (71%); however, the sample is representative of the demographics reported in the 2010 United States Census ("2010 Census Data," 2010). Demographic information on participants are summarized in Table 1. The majority of caregivers (68.7%) completed either college or graduate degrees. Nearly 50% of the participants (48.9%) reported a household income greater than \$50,000 per year.

Table 1: Participant Demographics

	Percentage of Total Sample
Gender	
Male	46.8
Female	53.2
Race/Ethnicity	
African-American	18.2
Asian	3.9
Hispanic	2.2
White	71.0
Other	4.8
Chronological Age	
3 years old	37.2
4 years old	33.8
5 years old	29.0
Maternal level of education	
No response	2.7
Some high school	2.2
High school diploma	7.6
Some college/ vocational school	18.8
College degree	39.7
Graduate degree	29

Table 1 (continued)

Family income	
No response	7.8
\$5,000	3
\$10,000	2.2
\$15,000	4.3
\$20,000	4.3
\$25,000	3.9
\$30,000	2.6
\$31,000-\$40,000	5.6
\$41,000-\$50,000	4.3
\$51,000-\$75,000	13
\$76,000-\$100,000	22.1
\$101,000-\$125,000	10.8
\$126,000-\$150,000	4.8
\$151,000-\$175,000	4.3
Higher than \$175,000	6.9

Note. n = 231 for full sample; n = 224 for maternal level of education

3.2 PERFORMANCE ON WRITING TASKS

Descriptive statistics on emergent writing measures are shown in Table 2 for the entire sample and by age group. Children undergo rapid changes in cognitive, oral language, and literacy skills during the preschool years and hence results are separated by age to account for maturation.

The mean score for the three-year-old children's letter writing indicates that they were unable to successfully write many, if any letters. A score of 3-4 would indicate that the child only wrote two letters well or wrote 3-4 letters that were poorly formed. The large range and standard deviation indicate high variability in the performance of the children. The mean score on the name writing task was four, which indicates that the average three-year-old was able to write his/her name using segmented symbols and left to right orientation. The mean score for the three-year-olds spelling task was 11.33, which indicates that they, at the most, spelled one word correctly. They could have also received this score by performing a variety of other early emerging writing abilities, but without achieving conventional spelling of the target words. The range and standard deviation indicate high variability within the children's low scores on this task.

By four years of age, children's mean scores on all three writing tasks showed improvement. Their mean score of 19.64 on the letter writing tasks indicates an increased ability to produce well-formed letters of the alphabet. The range and standard deviation continues to indicate high variability in performance on the letter writing task within the four-year-olds. Their mean name writing score of 8 indicates that they were able to produce near perfect approximations of their own first name. The four-year-olds mean spelling score of 31.22 is nearly half of the possible points they could receive. These scores suggest that that more

advanced emergent writing skills were apparent during this task compared to their three-year-old counterparts.

By five years of age, children's emergent writing skills continued to improve. Their mean letter writing score of 28.55 indicates that they were able to produce over half of the letters with good form. The large range and standard deviation indicate continued variability on this developing skill. On the name writing task, five-year-olds scored an average of 8.72, indicating that by this age, most children are able to correctly write their first names. By the age of five, no child received a score of 0 on this task, meaning that at the very least, children were able to make two discrete forms that could be shapes, lines, letter-like shapes, or conventional letters. Five-year-olds received a mean score of 43.48 on the spelling task, which is greater than 50% of the possible points they could receive. The range and standard deviation was also very large for this task, indicating the children's scores were still highly variable despite their increased mean score.

Table 2: Descriptive Statistics on Emergent Writing Measures

Age	Writing Task	Range	Mean	SD	Skewness	Kurtosis
Three-year-olds	Letter Writing	0-32	3.67	7.213	2.556	5.802
	Name Writing	0-9	3.95	2.731	0.313	-0.819
	Spelling	0-42	11.33	8.718	1.633	2.751
Four-year-olds	Letter Writing	0-51	19.64	17.832	0.366	-1.507
	Name Writing	0-9	7.79	2.054	-1.84	2.76
	Spelling	0-69	31.22	20.682	0.101	-1.388
Five-year-olds	Letter Writing	3-51	28.55	15.709	-0.311	-1.391
	Name Writing	2-9	8.72	0.997	-5.257	32.261
	Spelling	0-70	43.48	18.052	-0.606	-0.239
Full Sample	Letter Writing	0-51	16.28	17.42	-.432	-1.193
	Name Writing	0-9	6.63	2.98	1.006	-.252
	Spelling	0-70	27.37	21.02	1.256	.095

Note. n = 86 for three-year-olds; n = 78 for four-year-olds; n = 67 for five-year-olds; n = 231 for full sample

3.3 RELATIONSHIP BETWEEN HLE AND WRITING OUTCOMES

Spearman's Rho correlations were used to analyze the relationships between home literacy variables and writing outcomes. Spearman's Rho analysis is used to examine variables that are ordinal in nature or within data sets that are non-parametric (Schiavetti & Metz, 2006).

Data from correlation analysis between the three types of HLE and writing outcomes are shown in Table 3. Shared HLE experiences showed low but statistically significant correlations with letter writing and spelling ($r = .16$, $r = .14$, respectively; $p < .05$). The correlation between shared HLE and name writing was not significant. Similarly, casual HLE experiences also showed low but statistically significant correlations with letter writing and spelling scores ($r = .16$, $r = .15$, respectively; $p < .05$) but not with name writing. Independent HLE experiences were correlated with letter writing, name writing, and spelling ($r = .34$, $r = .26$, and $r = .23$, respectively; $p < .01$).

Table 3: Correlations between control variables, HLE, and writing outcomes

Independent Variable	Writing Outcomes		
	Letter Writing	Name Writing	Spelling
WPPSI-III Block Design	.37**	.37**	.33**
WPPSI-III Matrix Reasoning	.54**	.48**	.44**
Maternal Level of Education	0.09	0.07	0.11
Shared HLE	.16*	.12	.14*
Independent HLE	.34**	.26**	.23**
Casual HLE	.16*	.11	.15*

Note. 2-tailed Spearman's Rho correlations; *significant at the $p < .05$ level; **significant at $p < .01$ level; $n = 231$ full sample; $n = 224$ for maternal level of education; $n = 228$ for casual HLE

3.4 PREDICTIVE VALUE OF HLE ON WRITING OUTCOMES

Multi-variate regression analysis was performed to determine the predictive value of HLE on writing outcomes. For each writing task, predictors were entered into the analysis in three steps. First, the control variables were entered into the equation as a block. These control variables were cognitive abilities (WPPSI-III Block Design and Matrix Reasoning subtests) and maternal level of education. Based on the researcher's hypothesis, the independent HLE variable was entered in the second step. In the third and final step casual and shared HLE were entered into the model simultaneously.

3.4.1 Predictive value of HLE for letter writing

The descriptive statistics for the three-year-olds on the letter writing task were indicative of floor effects. Hence only data for the four and five-year-old children were used when examining the predictors of letter writing skills. The results for the letter writing task showed that the control variables accounted for a substantial and significant proportion of the variance in letter writing scores; $F(3, 134) = 12.57$, Adjusted $R^2 = .202$, $p < .001$. After the second step, when independent HLE was entered, results showed that independent HLE variable accounted for an additional 2.6% of the variance in letter writing scores; $F(4, 133) = 11.13$, Adjusted $R^2 = .228$, $p < .001$. Shared and casual HLE variables were entered in step three. The contribution of shared and casual HLE was not significant; $F(6, 131) = 7.58$, Adjusted $R^2 = .224$. The results from this analysis are shown in Table 4.

Table 4: Predictors of Preschool Letter Writing

		<i>B</i>	SE	β	<i>t</i>	<i>p</i>
Step 1	Intercept	-10.38	6.35		-1.64	0.10
	WPPSI-III Block Design	0.85	0.45	0.17	2.00	0.05*
	WPPSI-III Matrix Reasoning	1.43	0.36	0.34	3.94	.00**
	Maternal Level of Education	2.20	1.16	0.15	1.90	0.06
Step 2	Intercept	-18.24	7.08		-2.58	0.01**
	WPPSI-III Block Design	0.91	0.42	0.18	2.17	0.03*
	WPPSI-III Matrix Reasoning	1.19	0.37	0.28	3.18	.00**
	Maternal Level of Education	2.18	1.14	0.15	1.92	0.06
	Independent HLE	2.30	0.98	0.19	2.35	0.02*
Step 3	Intercept	-23.44	8.71		-2.69	0.01**
	WPPSI-III Block Design	0.95	0.43	0.20	2.21	0.03*
	WPPSI-III Matrix Reasoning	1.16	0.38	0.27	3.03	.00**
	Maternal Level of Education	2.22	1.15	0.15	0.06	0.06
	Independent HLE	1.78	1.09	0.14	0.11	0.12
	Shared HLE	1.23	1.59	0.07	0.44	0.44
	Casual HLE	0.58	1.70	0.03	0.74	0.74

Note. n = 145 for four and five-year-old group; n = 141 for maternal level of education; n = 142 for casual HLE; *significant at $p < .05$ level; ** significant at $p < .01$ level

3.4.2 Predictive value of HLE for name writing

Only data from three and four-year-old children were used in the analysis of the predictors of name-writing skills. Ceiling effects were noted for the five-year-old group, and were therefore excluded from this model. The results for the name writing task showed that the control variables accounted for a substantial and significant proportion of the variance in children's name writing scores; $F(3, 153) = 23.79$, Adjusted $R^2 = .305$, $p < .001$. When independent HLE was entered in the second step, it accounted for an additional 3.5% of the variance for name writing; $F(4, 152) = 21.11$, Adjusted $R^2 = .340$, $p < .001$. In the third step, shared and casual HLE were entered. The contribution of casual and shared HLE was not significant; $F(6, 150) = 14.28$, Adjusted $R^2 = .338$. The results from this analysis are shown in Table 5.

Table 5: Predictors of Preschool Name Writing

		<i>B</i>	SE	β	<i>t</i>	<i>p</i>
Step 1	Intercept	0.57	0.94		0.61	0.54
	WPPSI-III Block Design	0.19	0.07	0.20	2.49	0.01**
	WPPSI-III Matrix Reasoning	0.30	0.06	0.43	5.37	0.00**
	Maternal Level of Education	0.15	0.18	0.06	0.86	0.39
Step 2	Intercept	-0.82	1.02		-0.80	0.42
	WPPSI-III Block Design	0.18	0.07	0.20	2.53	0.01**
	WPPSI-III Matrix Reasoning	0.26	0.06	0.38	4.78	0.00**
	Maternal Level of Education	0.17	0.17	0.07	1.00	0.32
	Independent HLE	0.40	0.13	0.20	3.04	0.00**
Step 3	Intercept	-1.65	1.30		-1.26	0.21
	WPPSI-III Block Design	0.20	0.07	0.21	2.68	0.00**
	WPPSI-III Matrix Reasoning	0.25	0.06	0.37	4.58	0.00**
	Maternal Level of Education	0.15	0.17	0.06	0.87	0.39
	Independent HLE	0.83	0.15	0.19	2.49	0.01**
	Shared HLE	-0.08	0.27	-0.03	-0.31	0.75
	Casual HLE	0.31	0.26	0.10	1.18	0.24

Note. n = 164 for three and four-year-old group; n = 157 for maternal level of education;
 *significant at $p < .05$ level; ** significant at $p < .01$ level

3.4.3 Predictive value of HLE for spelling

Floor effects were noted on the spelling measure particularly for the three-year-old group, Consequently, data for the three-year-olds, was excluded from this analysis. The control variables entered in the first step of the analysis accounted for a substantial and significant amount of the variance; $F(3, 134) = 10.40$, Adjusted $R^2 = .171$, $p < .001$. Independent HLE was entered in the second step and did not contribute a significant amount to the variance in spelling scores; $F(4, 133) = 8.10$, Adjusted $R^2 = .172$. In step three, it was determined that the contribution of shared and casual HLE were not significant; $F(6, 131) = 5.79$, Adjusted $R^2 = .173$. The results from this analysis are shown in Table 6.

Table 6: Predictors of Preschool Spelling

		<i>B</i>	SE	β	<i>t</i>	<i>p</i>
Step 1	Intercept	-1.52	7.55		-0.20	0.84
	WPPSI-III Block Design	1.21	0.51	0.21	2.39	0.02*
	WPPSI-III Matrix Reasoning	1.29	0.43	0.26	2.98	0.00**
	Maternal Level of Education	2.87	1.38	0.16	2.08	0.04*
Step 2	Intercept	-5.86	8.56		-0.68	0.50
	WPPSI-III Block Design	1.24	0.51	0.21	2.45	0.02*
	WPPSI-III Matrix Reasoning	1.15	0.45	0.23	2.56	0.01**
	Maternal Level of Education	2.86	1.37	0.16	2.08	0.04*
	Independent HLE	1.27	1.18	0.09	1.07	0.29
Step 3	Intercept	-14.72	10.49		-1.40	0.16
	WPPSI-III Block Design	1.38	0.52	0.24	2.66	0.01**
	WPPSI-III Matrix Reasoning	1.04	0.46	0.21	2.26	0.03*
	Maternal Level of Education	2.72	1.39	0.16	1.96	0.05*
	Independent HLE	0.68	1.31	0.05	0.52	0.61
	Shared HLE	0.37	1.91	0.02	0.20	0.85
	Casual HLE	2.51	2.04	0.12	1.23	0.22

Note. n = 145 for four and five-year-old group; n = 141 for maternal level of education; n = 142 for casual HLE; *significant at $p < .05$ level; ** significant at $p < .01$ level

3.5 POST-HOC ANALYSIS OF INDEPENDENT HLE

Because the results indicated that independent HLE was a significant predictor of two of the three writing measures, additional descriptive examination of the relationship between independent home literacy activities and writing outcomes was performed. Writing is difficult and may therefore not be a very engaging activity for most children. It is highly likely that when a child is motivated, he or she will more likely engage in writing independently more often and/or perhaps initiate the writing activity. Further exploration into the issue of who initiated the activity and how frequently the child engaged in writing was important and was thus conducted.

Figures 1-3 plot the performance on the frequency with which children engaged in writing independently and their scores on the three writing tasks. As can be seen, children who more frequently practiced writing words and names independently also performed higher on the letter writing, name writing, and the spelling tasks. Name writing showed the least amount of change in scores as frequency with which a child independently wrote increased. Ceiling effects noted on the name writing task may account for this finding.

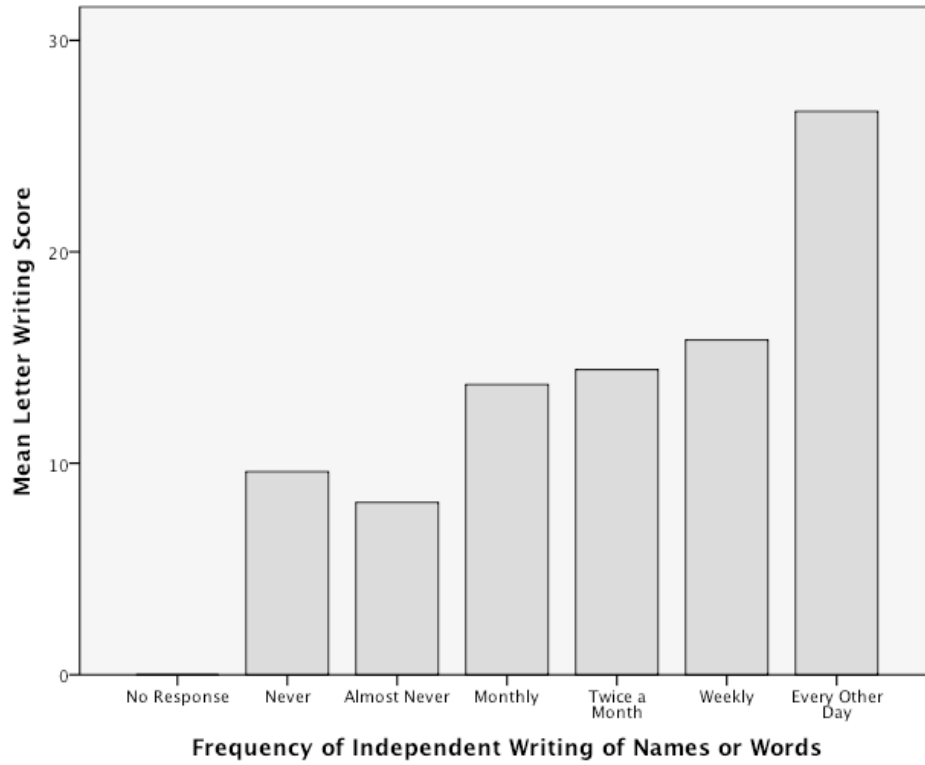


Figure 1: Frequency of independent writing of names or words and letter writing performance

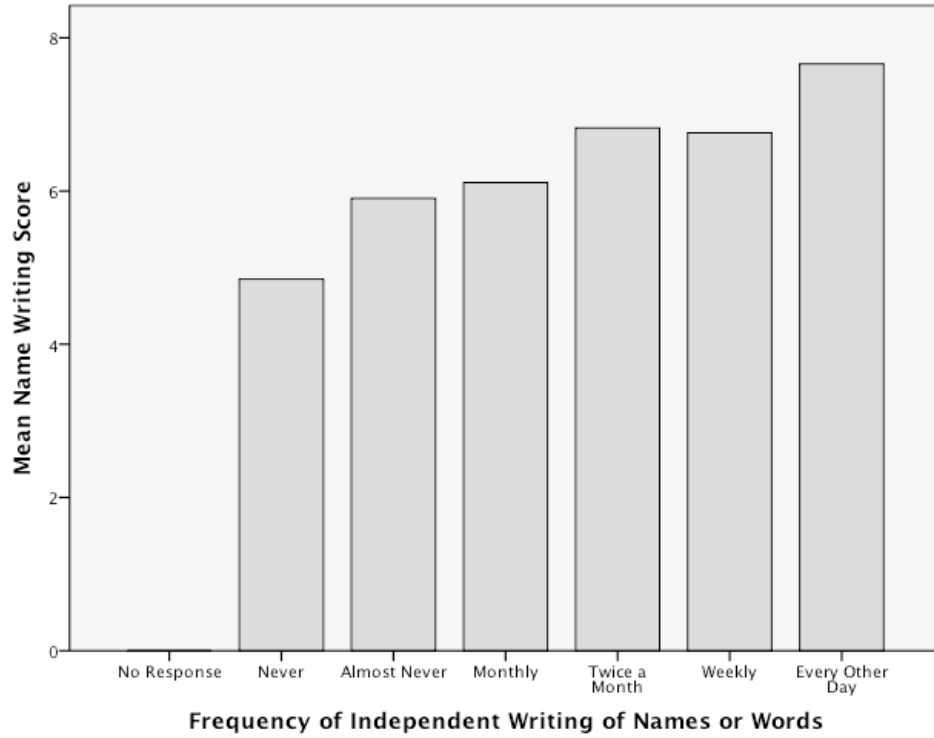


Figure 2: Frequency of independent writing of names or words and name writing performance

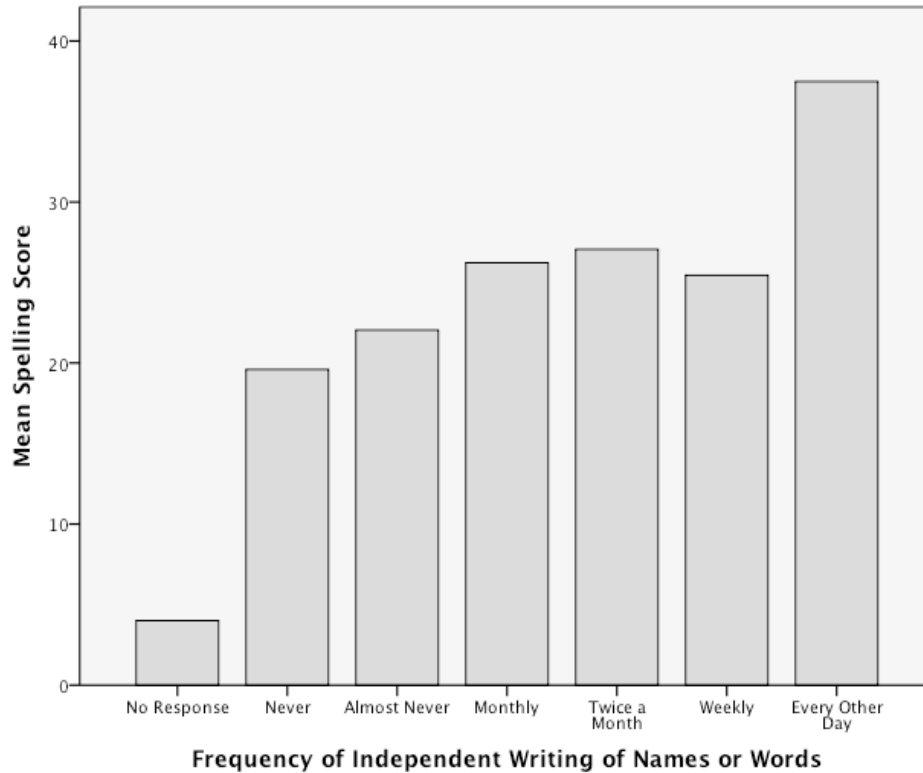


Figure 3: Frequency of independent writing of names of words and spelling performance

The second analysis examined the question of who initiated writing activities in the home. Figures 4-6 show that the children who were more likely to initiate writing activities also performed higher on the writing tasks. This relationship is very transparent for the letter writing and spelling tasks, however, less straightforward perhaps due to the ceiling effects seen on the name writing task.

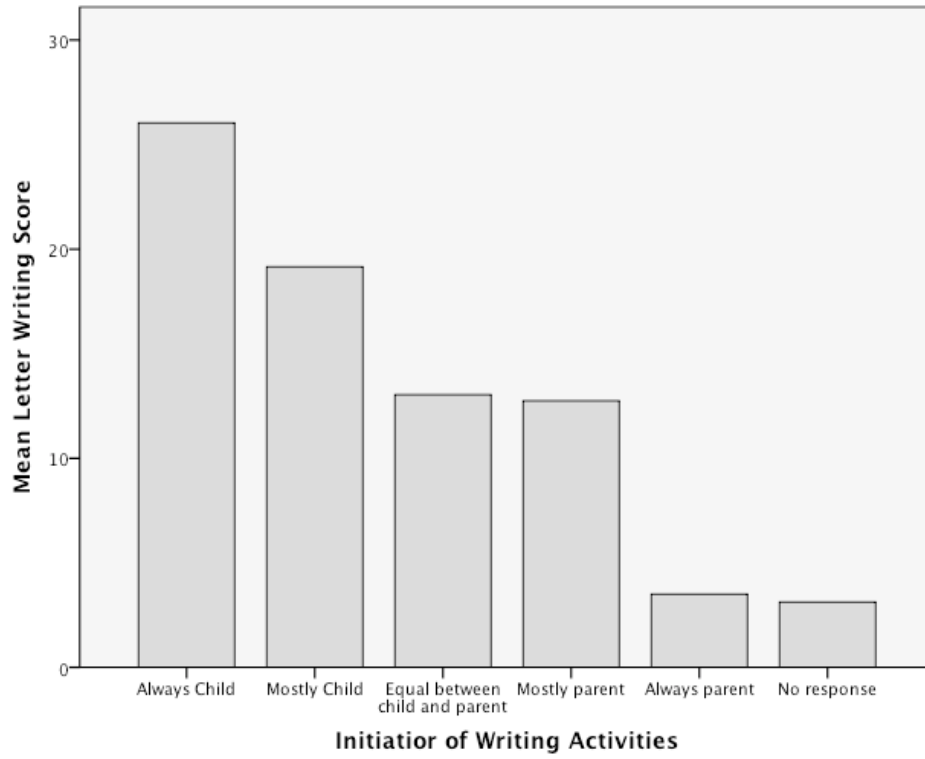


Figure 4: Mean letter writing performance based on who initiated the writing activity

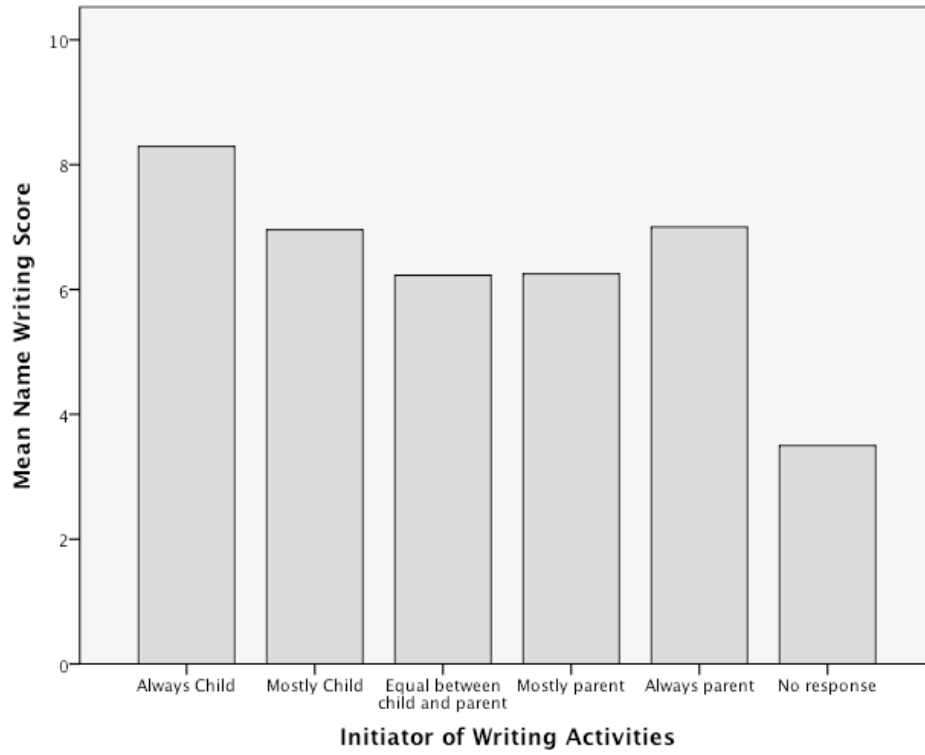


Figure 5: Mean name writing performance based on who initiated the writing activity

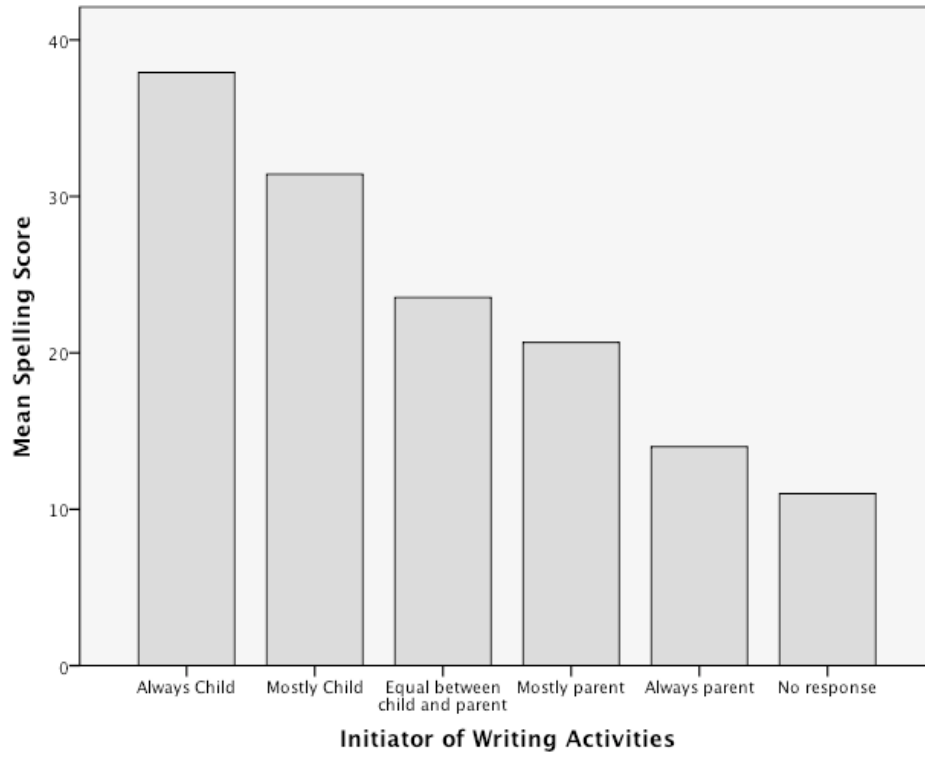


Figure 6: Mean spelling performance based on who initiated the writing activity

4.0 DISCUSSION

The purpose of the current study was to examine the relationship between home literacy environment and emergent writing skills in preschool children. Types of home literacy experiences were classified as shared, independent, and casual activities, based on research indicating that language and literacy skills are differentially impacted by different activities (Hood, et al., 2008; Senechal & LeFevre, 2002; Senechal, et al., 1998).

Results of a correlational analysis indicated that there was a significant positive correlation between independent home literacy activities and all emergent writing tasks. The regression analysis also showed that independent HLE accounted for a significant additional amount of the variance on two of the three emergent writing tasks (2.6% for letter writing, and 3.5% for name writing). These findings are supportive of the researcher's hypothesis, that independent HLE would play an important role in preschool children's emergent writing skills and suggests that independent literacy activities in the home appear to be a crucial aspect of the development of emergent writing skills. Additionally, a visual examination of the data shown in Figures 1-3 showed that when the child independently practices writing names and words, he or she also performed higher on all three writing tasks. Figures 4-6 also show that when the child is more likely to initiate writing activities, he or she also performed more accurately on the writing tasks. The relationship between independent home literacy activities and emergent writing tasks is consistent with evidence that the level of child autonomy in an activity is an important factor

in his or her success in reading and writing (Aram & Levin, 2001). Aram & Levin (2001) found that there were significant positive correlations between maternal mediation, as measured by the autonomy allowed during the task, and word writing and recognition measures ($r = .74$; $p < .001$). Type of maternal mediation accounted for 22% of the variance in word writing and recognition scores. The authors suggested that mediating literacy activities at a higher level and allowing more autonomy was more successful in revealing the child's true skills and will lead to more appropriate activities and mediation level in the future. The current study included questions that examined completely independent activities, and these results suggest independence in the initiation and completion of writing activities is an important factor in the development of emergent writing skills. Independent HLE did not show up as a significant predictor of spelling. This could be because spelling is a generally difficult task for preschoolers and it may be more appropriate for older children. It is also more than likely that parents do not work on spelling with their preschool children.

Shared and casual HLE showed a weak but significant correlation with letter writing and spelling tasks but not name writing. Name writing was not correlated with shared or casual HLE, potentially due to the ceiling effects that occurred for the name writing task. The data for name writing were not normally distributed since a large percentage (57.2%) of the children received perfect or a near perfect score on this task, which may explain the lack of significant results. The correlation between shared HLE and letter writing and spelling is consistent with the literature that suggests that formal, code-related activities appear to have the greatest impact on literacy skills (Hood, et al., 2008; Senechal & LeFevre, 2002; Senechal, et al., 1998). The questions targeting shared HLE activities included asking parents how often they helped their child learning letters of the alphabet and how often the parent and child worked on writing

simultaneously. These shared tasks between parent and child could be classified as formal, code-related activities. The significance of casual experiences on writing outcomes is also consistent with the literature stating that informal experiences help to facilitate emergent literacy skills indirectly by increasing oral language skills (Hood, et al., 2008; Senechal & LeFevre, 2002; Senechal, et al., 1998). The questions targeting casual HLE included asking parents how often they point out environmental print to their children and how often children observe their parents performing conventional writing tasks. These casual activities between parent and child could be classified as informal activities. However, the results of the current study should be interpreted cautiously because previous research did not demonstrate the same direct relationship between informal HLE and literacy skills (Hood, et al., 2008; Senechal & LeFevre, 2002; Senechal, et al., 1998).

Despite significant findings in the correlational analysis, shared and casual HLE did not contribute a significant proportion of the variance in writing scores for any of the three writing tasks. This finding is inconsistent with the literature suggesting that formal and informal activities contribute, both directly and indirectly, to the development of emergent literacy skills (Hood, et al., 2008; Senechal & LeFevre, 2002; Senechal, et al., 1998) However, the majority of that research was confined to examining the relationship between shared and informal HLE and emergent reading skills. The findings of the current study suggest that the home experiences that facilitate reading and writing skills require different levels of parental involvement and the difference between the parental activities that facilitate reading versus writing may have to do with the encouragement of independent practice. Specifically, the results of this study indicate that whereas shared and casual HLE experiences between parents and their children are crucial,

it is more important for parents to facilitate independence when it comes to their children engaging in writing activities.

Finally, the results the regression analysis showed that the control variables namely, cognitive abilities and maternal level of education, accounted for a significant proportion of the variance in emergent writing skills; 20.2% for letter writing, 30.5% for name writing, and 17.1% for spelling. This finding is consistent with previous research that has indicated that cognitive abilities and maternal level of education are important predictors of children's emergent literacy skills (Aram & Levin, 2001; Payne, et al., 1994; Phillips & Lonigan, 2009; Whitehurst & Lonigan, 1998).

4.1 LIMITATIONS

Results of the current study were found using descriptive research methods, which have inherent flaws for determining causation (Schiavetti & Metz, 2006). Without having experimental control over the home literacy environment, there is less certainty that extraneous variables are not causing the differences in writing outcomes (Schiavetti & Metz, 2006).

The evaluation of HLE was also done through a survey, which relies on participants' honesty to provide the data. The researcher cannot be sure what was reported is what actually occurs in the home on a regular basis. To the researcher's knowledge, there is no standardized home literacy survey with adequate validity and reliability to examine emergent writing, and therefore a researcher-generated survey was used in the current study. Reliability and validity for this researcher-generated survey has not yet been established.

There is no standardized way in which SES is calculated. Some researchers use maternal level of education as a proxy for SES whereas others use family income. Some studies combine the two. In this study, a high correlation was noted between maternal level of education and family income ($r = .44, p < .001$). To avoid issues of multicollinearity, only maternal level of education was used in this study. However, examination of the income distribution of families that participated in this study indicated that the majority of them reported high incomes. Practices of these families may be different from families reporting lower incomes; thus results may not be representative of the population as whole due to this uneven income distribution. Family income is an important factor in the literacy environment and subsequent development of language and literacy skills (Aram & Levin, 2001; Payne, et al., 1994; Phillips & Lonigan, 2009) and should ideally be accounted for when examining the role of HLE and writing as well. Teasing apart the effect of maternal level of education and family income and how they impact emergent writing skills may be an important topic for future research.

4.2 IMPLICATIONS AND FUTURE RESEARCH

The current study found that home literacy experiences have weak but significant correlation with emergent writing outcomes in this sample of preschool children. This finding suggests that parents might be able to facilitate emergent writing skills through both shared and casual activities with their children. Independent HLE appears to have an important relationship with emergent writing skills. This important finding suggests that the encouragement of the independent writing practice in young children could facilitate emergent writing skills in preschool.

Additional research is necessary in this area in order to develop a deeper understanding of the impact of HLE on emergent and conventional writing. The development of a reliable and valid measure to examine home literacy environment would be of great significance to this field of study. Another improvement to this area of study would be the development of an experimental method in which to study the home environment. By providing parents with protocols and training on different home literacy activities, researchers would have more experimental control. With an experimental design, researchers could establish that different types home literacy environment causes the differences seen in emergent writing skills.

The mounting research which suggests that shared book reading increases children's language and literacy skills has resulted in a surge in the popularity of book reading activity among parents of young children. Whereas the common reading activities that take place in the home are very clear, less is known about the specific writing activities that parents engage in with their children. Additional research into the area of emergent writing should focus on determining the specific types of activities parents engage in with their children. This information could further help parents, teachers, clinicians, and researchers understand the activities that facilitate emergent writing skills. Hopefully, this knowledge will increase the quality and quantity of the shared, casual, and independent writing activities that occur in the home during the preschool years, setting children up for a successful transition into conventional writing.

APPENDIX A

HOME LITERACY QUESTIONNAIRE

The information in these questionnaires will be used only to help us learn more about factors affecting literacy development in preschool children. This information will be treated with the strictest confidentiality and will not be released to anyone outside the staff of the project. For each question, please circle or check the appropriate answer or fill in the requested information. Please try to provide an answer for all questions, even if it represents your "best guess." Thank you in advance for your time and support.

1. Today's date: _____ 2. Child's date of birth: _____

2. Your relationship to child:

Father Mother Both Grandparent Other _____

3. What language(s) is spoken in your home?

4. Child's ethnicity:

African American American Indian/Alaska Native
 Asian Hawaiian/Other Pacific Islander
 Hispanic White Other _____

5. What is the highest level of education attained by you and by your child's other parent?

	You	Other Parent
Some high school	<input type="checkbox"/>	<input type="checkbox"/>
High school diploma	<input type="checkbox"/>	<input type="checkbox"/>
Some college/vocational training	<input type="checkbox"/>	<input type="checkbox"/>
College degree	<input type="checkbox"/>	<input type="checkbox"/>
Graduate degree	<input type="checkbox"/>	<input type="checkbox"/>

6. What is your current occupation?

7. What is your child's other parent's current occupation?

8. What is your family income to the nearest \$5,000 per year (check one number or range)?

- \$5,000
 \$10,000
 \$15,000
 \$20,000
 \$25,000
 \$30,000
 \$31,000-\$40,000
 \$41,000-\$50,000
 \$51,000-\$75,000
 \$76,000-\$100,000
 \$101,000-\$125,000
 \$126,000-\$150,000
 \$151,000-\$175,000
 Higher Than \$175,000

9. Did your child attend preschool? Yes No

If so, for how many years did your child attend preschool? _____ years

10. Where will your child be attending school in the fall?

School Name and Address: _____

11. Please rate the following statements about your child's personality.

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
My child...	1	2	3	4	5
is very anxious					
is hyperactive					
has good attention					
is persistent					
is easily distracted					

12. On average, how long can your child sit at a table and focus on an activity?

- Less than 5min
 5-10min
 10-20min
 20-30min
 Over 30min

13. Does your child enjoy writing, drawing, or using writing materials?

- Yes
 Sometimes
 No

If *yes or sometimes*, who initiates these activities?

- Always Child
 Mostly Child
 Equal
 Mostly Parent
 Always Parent

14. Estimate the number of children's books in your home?

- None 1-50 51-100 101-200 More than 200

15. About how many of these are alphabet books?

- None 1-5 6-10 11-15 16-20 20-30

16. What do you do with your child's drawings or art/craft work?

- Post them somewhere (for e.g., put them up on the refrigerator)
 File them in a folder
 Send them to other family members
 Throw them away
 Other: _____

17. What do you do with the notes your child writes?

- Post them somewhere, for example put them up on the refrigerator
 Send them to other family members
 File them in a folder
 Throw them away
 Other: _____

Please check one box and rate the following statements about your child:	Never	Almost never	Monthly	Twice a month	Weekly	Every other day
18. Does your child have difficulty with fine motor tasks such as using scissors, pencils, etc?						
19. Does your child have alphabet games? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, how often does he or she play with these games?						
20. How often do you help your child with learning the letters of the alphabet?						
21. How often do you help your child with writing letters of the alphabet?						
22. How often does your child work alone on writing letters of the alphabet?						
23. How often is print in the environment pointed out to the child? (e.g., signs, store names, labels)						
24. How often do you help your child learn to write his or her name, or other words?						
25. How often does your child attempt to write names or words independently?						

26. How often do you and your child do writing activities at the same time? (e.g. parent writes a note while child practices writing his or her name)						
27. How often do you involve your child in writing notes or birthday cards to members of your family?						
28. Do you and your child keep a journal or does your child keep a journal (This may involve pictures and words or sentences)?						
29. How often does your child use a computer for literacy related activities (e.g., playing alphabet games, reading a story)?						
30. How often does your child observe a parent using the computer?						

APPENDIX B

SCORING OF WRITING TASKS

Table 7: Scoring of Letter Writing

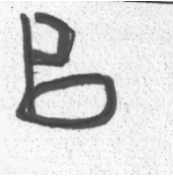



Score	Description	Example 1	Example 2
0	No response, wrong letter, unrecognizable		
1	Poorly formed/written letter, reversals		
2	Completely legible letter		

Table 8: Scoring of Name Writing

Score	Description
1	Linearity- Marks appear organized around a horizontal or vertical axis (i.e., the forms are not distributed randomly over the page).
2	Segmentation/Discreteness- writing contains distinguishable/separate units (e.g., circles, dots, letters, or letter like characters that are separated). Child needs to have at least 2 to receive credit; marks appear relatively separated from each other with more or less regular blanks between them. A cursive line that goes up and down repeatedly is considered segmented (imitation of adult cursive writing).
3	Simple units-presence of distinguishable units, e.g., dots, lines, or circles. The child must have written at least 2 units to receive credit.
4	Left-to-right orientation (writes from left to right)
5	Complex characters (combination of real and pseudo letters)
6	Writes first letter of name
7	Random Letters (real letters only)
8	Many letters- more than half of the letters in first name
9	Conventional/correct spelling of first name

Note. Responses were scored with a 1 or 0 for the absence or presence of each feature; Inverted letters were counted as correct in this section.

Table 9: Scoring of Spelling

Score	Stage	Rule
0		No response
1	Graphic	A scribble produced by scratching.
2		A single good form (e.g., a square, a circle-like form, a triangle-like form) not produced just by scratching, but in a more controlled manner.
3	Literate	Conventional symbol: The writing contains at least one real letter not phonetically related to the letters in the word. A dot or circle on its own is not considered a conventional symbol.
4		Random string of letters: More than one random (not phonetically related) letters.
5	Early Phonetic	Early phonetic representation: The writing contains at least a single letter that is phonetically related to the word of the child was asked to write in any position of the word.
6		Correct first letter of the word: Correct first letter in initial position and/or with other phonetically related letters.
7	Phonetic	Multiple phonetic representations: The writing contains 2/3 related phonemes but not a repetitions of the same letter. The first letter of the word must be in the initial position.
8		Invented spelling: The writing contains two or more phonetic letters that represent most of the word's phonemes, along with any attempt to represent the vowel.
9	Correct	Conventional spelling: The word the child was asked to write is written in its conventional form.

BIBLIOGRAPHY

- 2010 Census Data. (2010). 2013, from <http://www.census.gov/2010census/data/>
- Adams, M.J. (1990). *Learning to read: Thinking and learning about print*. Cambridge, MA: MIT Press.
- Aram, D., & Levin, I. (2001). Mother-child joint writing in low SES sociocultural factors, maternal mediation, and emergent literacy. *Cognitive Development, 16*, 831-852.
- Blair, R., & Savage, R. (2006). Name writing but not environmental print recognition is related to letter-sound knowledge and phonological awareness in pre-readers. *Reading and Writing Quarterly, 34*, 342-367.
- Bloodgood, J.W. (1999). What's in a name? Children's name writing and literacy acquisition *Reading Research Quarterly, 34*, 342-367.
- Both-de Vries, A., & Bus, A.G. (2008). Name writing: A first step to phonetic writing? Does the name have a special role in understanding the symbolic function of writing?. *Literacy Teaching and Learning, 12*, 37-55.
- Both-de Vries, A., & Bus, A.G. (2012). The proper name as a starting point for basic reading skills. *Reading and Writing, 23*, 173-187.
- Bradley, R., Corwyn, R., Burchinal, M., McAdoo, H., & Garcia Coll, C. (2001). The home environments of children in the United States. Part II: Relations with behavioral development through age thirteen. *Child Development, 72*, 1868-1886.
- Bradley, R., Corwyn, R., McAdoo, H., & Garcia Coll, C. (2001). The home environments of children in the United States. Part I: Variations by age, ethnicity, and poverty status. *Child Development, 72*, 1844-1867.
- Clay, M.M. (1975). *What did I write?* Auckland, New Zealand: Heinemann.
- Clay, M.M. (1979). *Reading: The patterning of complex behavior*. Auckland: Heinemann.
- Dickinson, D., & Snow, C.E. (1987). Interrelationships among prereading and oral language skills in kindergartners from two social classes. *Early Childhood Research Quarterly, 2*, 1-25.

- Dickinson, D.K., & DeTemple, J. (1998). Putting parents in the picture: Maternal reports of preschoolers' literacy as a predictor of early reading. *Early Childhood Research Quarterly, 13*, 241-261.
- Dunn, L.M., & Dunn, L.M. (1981). Peabody Picture Vocabulary Test-Revised Circle Pines, MN: American Guidance Service.
- Ehri, L. (2000). Learning to read and learning to spell: Two sides of a coin. *Topics in Language Disorders, 20*(3), 19-36.
- Elardo, R., Bradley, R., & Caldwell, B.M. (1975). The relation of infants' home environment to mental test performance from six to thirty-six months: A longitudinal study. *Child Development, 46*, 71-76.
- Fawcett, A.J., & Nicolson, R.I. (1996). The Dyslexia Screening Test. London, United Kingdom: Psychological Corporation.
- Ferreiro, E. (1986). The interplay between information and assimilation in beginning literacy. In W.H. Teale & E. Sulzby (Eds.), *Emergent literacy: Writing and reading* (pp. 15-49). Norwood, NJ: Ablex.
- Ferreiro, E., & Teberosky, A. (1982). *Literacy before schooling* Exeter, NH: Heinemann.
- Foy, J.G., & Mann, V. (2003). Home literacy environment and phonological awareness in preschool children: Differential effects for rhyme and phoneme awareness. *Applied Psycholinguistics, 24*, 59-88.
- Frijters, J.F., Barron, R.W., & Brunello, M. (2000). Direct and mediated influences of home literacy and literacy interest on prereaders' oral vocabulary and early written language skill. *Journal of Educational Psychology, 92*, 466-477.
- Gardner, M.F. (1981). Expressive One-Word Picture Vocabulary Test Notato, CA: Academic Therapy Publications.
- Graham, S., Berninger, V.W., Abbott, D., Abbott, S., & Whitaker, D. (1997). Role of mechanics in composing elementary school students: A new methodological approach. *Journal of Educational Psychology, 89*, 170-182.
- Hood, M., Conlon, E., & Andrews, G. (2008). Preschool home literacy practices and children's literacy development: A longitudinal analysis. *Journal of Educational Psychology, 100*, 252-271.
- Juel, C. (1988). Learning to read and write: a longitudinal study of 54 children from first through fourth grades. *Journal of Educational Psychology, 80*, 437-447.
- Lonigan, C.J., Schatschneider, C., & Westburg, L. (2008). Identification of children's skills and abilities linked to later outcomes in reading, writing, and spelling. *National Early*

- Literacy Panel, Developing early literacy: Report of the National Early Literacy Panel* (pp. 55-106). Washington, DC: National Institute for Literacy.
- Martens, P.A. (1999). Mommy, how do you write "Sarah?": The role of name writing in one child's literacy. *Journal of Research in Childhood Education* 14, 5-15.
- Mason, J.M., & Stewart, J.P. (1990). Emergent literacy assessment for instructional use in kindergarten. In L. Morrow & J. Smith (Eds.), *Assessment for instruction in early literacy* (pp. 155-175). Englewood Cliffs, NJ: Prentice Hall.
- McBride-Chang, C. (1998). The development of invented spelling. *Early Education and Development*, 9(2), 147-160.
- McGee, L.M., & Richgels, D.J. (1989). "K" is Kristen's": Learning the alphabet from a child's perspective *The Reading Teacher*, 43, 216-225.
- Moats, L.C. (2005). How spelling supports reading. *American Educator*, 29(4), 12-22.
- National Commission on Writing for America's Families, Schools, and Colleges. (2005). *Writing: A powerful message from state government*. New York: The College Board.
- National Commission on Writing for America's Families, Schools, and Colleges. (2004). *Writing: A ticket to work...or a ticket out: A survey of business leaders*. New York: The College Board.
- National Institute of Child Health and Human Development, E.C.C.R.N. (2000). The relation of child care to cognitive and language development. *Child Development*, 71, 960-980.
- National Institute of Child Health and Human Development, E.C.C.R.N. (2002). Early child care and children's development prior to school entry: Results from the NICHD study of early child care. *American Educational Research Journal*, 39, 133-164.
- Payne, A.C., Whitehurst, G.J., & Angell, A.L. (1994). The role of home literacy environment in the development of language ability in preschool children from low-income families. *Early Childhood Research Quarterly*, 9, 427-440.
- Phillips, B.M., & Lonigan, C.J. (2009). Variations in the home literacy environment of preschool children: A cluster analytic approach. *Scientific Studies of Reading*, 13, 146-174.
- Puranik, C.S., & Apel, K. (2010). Effect of assessment task and letter writing ability on preschool children's spelling performance. *Assessment for Effective Intervention*, 36, 46-56.
- Puranik, C.S., & Lonigan, C.J. (2009). From scribbles to scrabble: preschool children's developing knowledge of written language. *Reading and Writing*, 24, 567-589.

- Puranik, C.S., Lonigan, C.J., & Kim, Y.S. (2011). Contributions of emergent literacy skills to name writing, letter writing and spelling in preschool children. *Early Childhood Research Quarterly, 26*, 465-474.
- Reid, D.K., Hresko, W.P., & Hammil, D.D. (1981). *The Test of Early Reading Ability*. Austin, TX: Pro-Ed.
- Richgels, D.J. (1995). Invented spelling ability and printed word learning in kindergarten. *Reading Research Quarterly, 30*, 96-109.
- Ritchey, K.D. (2008). The building blocks of writing: Learning to write letters and spell words. *Reading and Writing: An Interdisciplinary Journal, 21*, 27-47.
- Roberts, J., Jurgens, J., & Burchinal, M. (2005). The role of home literacy practices in preschool children's language and emergent literacy skills. *Journal of Speech, Language, and Hearing Research, 48*, 345-359.
- Scarborough, H.S. (1998). Early identification of children at risk for reading disabilities: Phonological awareness and some other promising predictors. In B.K. Shapiro, P.J. Accardo & A.J. Capute (Eds.), *Specific reading disability: A view of the spectrum* (pp. 75-119). Timonium, MD: York Press.
- Scarborough, H.S. (2001). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. . In S. Neuman & D. Dickinson (Eds.), *Handbook for research in early literacy*. New York, NY: Guilford Press.
- Schiavetti, N., & Metz, D.E. (2006). *Evaluating Research in Communicative Disorders* (Fifth ed.). Boston, MA: Pearson Education Inc.
- Senechal, M., & LeFevre, J. (2002). Parental involvement in the development of children's reading skill: A five-year longitudinal study. *Child Development, 73*, 445-460.
- Senechal, M., LeFevre, J., Thomas, E.M., & Daley, K.E. (1998). Differential effects of home literacy experiences on the development of oral and written language. *Reading Research Quarterly, 33*(1), 96-116.
- Shanahan, T. (2006). Relations among oral language, reading, and writing development. In C. MacArthur, S. Graham & J. Fitzgerald (Eds.), *Handbok of writing research* (Vol. xi, pp. 171-183). New York, NY: Guilford Press.
- Shanahan, T., & Lomax, R.G. (1986). An analysis and comparasion of theoretical models of the reading-writing relationship. *Journal of Educational Psychology, 78*, 116-123.
- Singleton, C.H., Thomas, K.V., & Leedale, R.C. (1997). *CoPS 1 Cognitive Profiling System: Windows edition*. Beverly, East Yorks, United Kingdom: Lucid Research Limited.

- Stage, S., & Wagner, R.K. (1992). Development of young children's phonological and orthographic knowledge as revealed by their spellings. *Developmental Psychology*, 28, 287-296.
- Stanovich, K.E. (1986). Matthew effects in reading: some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly*, 21(4), 360-407.
- Stevenson, H.W., & Newman, R.S. (1986). Long-term prediction of achievement and attitudes in mathematics and reading. *Child Development*, 57, 646-659.
- Sulzby, E. (1989). Assessment of writing and of children's language while writing. In L. Morrow & J. Smith (Eds.), *The role of assessment and measurement in early literacy instruction* (pp. 83-109). Englewood Cliffs, NJ: Prentice-Hall.
- Sulzby, E., & Teale, W.H. (1991). Emergent literacy. In R. Barr, M. Kamil, P. Mosenthal & P.D. Pearson (Eds.), *Handbook of reading research* (Vol. 2, pp. 727-758). New York: Longman.
- Teale, W.H., & Sulzby, E. (1986). *Emergent literacy: Writing and reading* Norwood, NJ: Ablex.
- Tolchinsky, L. (2003). *The cradle of culture and what children know about writing and numbers before being taught*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Treiman, R. (2006). Knowledge about letters as a foundation for reading and spelling In R.M. Joshi & P.G. Aaron (Eds.), *Handbook of orthography and literacy* (pp. 581-599). Mahwah, NJ: Erlbaum.
- Treiman, R., & Bourassa, D.C. (2000). The development of spelling skill. *Topics in Language Disorders*, 20, 1-17.
- Wagner, R.K., Torgesen, J.K., & Rashotte, C.A. (1994). Development of reading-related phonological processing abilities: new evidence of bidirectional causality from a latent variable longitudinal study. *Developmental Psychology*, 30, 73-87.
- Wechsler, D. (1989). Wechsler preschool and primary scale of intelligence-Revised. San Antonio, TX: Psychological Corporation.
- Wechsler, D. (2002). Wechsler Preschool and Primary Scale of Intelligence- Third Edition. San Antonio, TX: The Psychological Corporation.
- Whitehurst, G.J. (1992). *Stony Brook Family Reading Survey*. Stony Brook, NY: Author.
- Whitehurst, G.J., & Lonigan, C.J. (1998). Child development and emergent literacy. *Child Development*, 69, 848-872.

Whitehurst, G.J., & Lonigan, C.J. (2001). Emergent literacy: Development from prereaders to readers. In S. Neuman & D. Dickinson (Eds.), *Handbook of early literacy research* (pp. 11-29). New York: Guilford Press.

Woodcock, R.W. (1997). Woodcock Diagnostic Reading Battery. Itasca, IL: Riverside Publishing