

# Home Literacy Environment and Head Start Children's Language Development: The Role of Approaches to Learning

# Christine Meng

## Department of Curriculum and Instruction, University of Wisconsin-Madison

*Research Findings:* This study examined whether approaches to learning moderate the association between home literacy environment and English receptive vocabulary development. The Head Start Family and Child Experiences Survey (2003 cohort) was used for analysis. Latent growth curve modeling was utilized to test a quadratic model of English receptive vocabulary development. Results showed that children's approaches to learning significantly moderated the influence of home literacy environment on English receptive vocabulary development. Post hoc probing of the simple slopes demonstrated that children with more positive approaches to learning and lower levels of home literacy environment had a higher English receptive vocabulary trajectory. The implications of the study results for early literacy interventions are discussed. *Practice or Policy:* Findings from this study may have implications for early educators who aim to improve Head Start children's language competencies by targeting home literacy environment and approaches to learning. At a preliminary level, the study findings suggest that positive approaches to learning may compensate for a limited home literacy environment. Because positive approaches to learning can facilitate learning in other domains, for instance, language learning, this information may be useful for early educators in terms of promoting positive learning attitudes and predispositions toward learning.

Language competencies have been considered an important component that contributes to young children's school success (K. L. Snow, 2006). Research documents that parental influence in the preschool period is a significant predictor of young children's language competencies during and beyond the preschool period (Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002). The family literacy environment has been widely studied as an important factor that influences young children's language development (Fletcher, Cross, Tanney, Schneider, & Finch, 2008; Saracho, 2007; Sénéchal & LeFevre, 2002). Children who are exposed to various family literacy activities demonstrate greater growth in their language competencies because family literacy activities create opportunities and experiences for young children to interact with adults and with print materials (Sénéchal, LeFevre, Thomas, & Daley, 1998; Stanovich & Cunningham, 1993). Nevertheless, the mechanisms that explain how the family literacy environment is associated with young children's language skills remain to be explored. Family literacy environment may be related to young children's language skills under the condition that young children

Correspondence regarding this article should be addressed to Christine Meng, 225 North Mills Street, Madison, WI 53706-1795. E-mail: cmeng2@wisc.edu

demonstrate positive *approaches to learning*, which refers to children's positive and adaptive behaviors that are conducive to learning. It is possible that approaches to learning can either promote and strengthen early language learning or protect children from the negative effect of a lack of literacy exposure at home on language development (Hyson, 2008). This study explored this possibility by examining the association among family literacy environment, approaches to learning, and receptive vocabulary with a nationally representative sample of Head Start children.

English vocabulary acquisition is crucial to children's reading readiness and school performance in kindergarten (Farrant & Zubrick, 2013). Children from low-income families have been shown to lag behind their peers who come from high-income families in school readiness skills (Neuman & Celano, 2006). Early childhood programs, such as Head Start programs, aim to support low-income children's school readiness skills in the areas of print concepts, basic vocabulary, numbers, and so forth (K. L. Snow, 2006). In addition, parental involvement in terms of reading and teaching children school readiness skills has been shown to facilitate low-income Head Start children's language competencies (Bierman et al., 2008; Britto, Brooks-Gunn, & Griffin, 2006; Chazan-Cohen et al., 2009; Joe & Davis, 2009). Understanding the mechanisms through which the family literacy environment influences young children's language competencies, particularly receptive vocabulary, can have implications for early educators.

## HOME LITERACY ENVIRONMENT AND LANGUAGE DEVELOPMENT

Early childhood is the period when children demonstrate rapid growth in language skills. Between 18 months and 6 years of age, some children can increase their vocabulary from an average of 50 words to an average of 10,000 words (Diesendruck, 2007). Children also begin to learn the sounds that correspond to different letters and words, to break down words, to combine different words to form sentences, to blend different sounds to create combinations of words, and to learn to discriminate different sounds (Anglin, 1989; Crain-Thoreson & Dale, 1992; Frijters, Barron, & Brunello, 2000; Sénéchal, Pagan, Lever, & Ouellette, 2008; Whitehurst & Lonigan, 1998). Given that vocabulary acquisition is the foundation for later language comprehension and reading competence (Anglin, 1993), providing young children a home environment with rich language and literacy experiences can nurture language growth at an early age.

Children's vocabulary development occurs in a social setting (Hoff, 2006). The literacy activities and experiences that parents construct at home create an opportunity for children to interact with adults and with print materials, thereby promoting young children's early language skills (Saracho, 2007; Sénéchal et al., 1998; Stanovich & Cunningham, 1993). The home literacy environment encompasses a wide range of literacy experiences and activities that include informal literacy experiences (Burgess, 2011; Sénéchal, 2006). *Informal literacy experiences*, such as shared book reading, focus on storytelling and the pictures in the book. *Formal literacy experiences*, such as parent teaching, refers to literacy experiences are associated with children's interest in print and vocabulary knowledge, formal literacy experiences have been associated with reading and literacy skills (Sénéchal, 2006). This study focused on informal literacy experiences and activities that parents provide for their children at home.

Informal home literacy experiences promote young children's language skills through exposure to language and print activities, for instance, rhyming, word games, and shared book

reading (Burgess, 2002). The purpose of language games (e.g., rhyming) is to focus young children's attention on the structural aspect of language to acquire knowledge with regard to letters, letter–sound relationships, and grammatical structures (C. E. Snow, 1983; Whitehurst & Lonigan, 1998). Although some informal home literacy activities directly focus on print and language structures, other activities, such as a trip to the library or the museum, provide young children with literacy experiences that link to the real world. Shared book reading is a widely studied informal home literacy activity that has been documented to have a moderate effect size (d = .67) on children's language skills (Bus, van Ijzendoorn, & Pellegrini, 1995) and can increase children's expressive vocabulary (Sénéchal et al., 2008), oral language complexity (Isbell, Sobol, Lindauer, & Lowrance, 2004; Sonnenschein & Munsterman, 2002), phonological awareness (Frijters et al., 2000), and letter–sound relationships (Crain-Thoreson & Dale, 1992). Intervention studies (e.g., Aram, 2006) also provide evidence to support the positive relation between shared book reading interventions and children's letter knowledge, vocabulary knowledge, and phonological awareness.

Nevertheless, home literacy practices vary across socioeconomic status. Shared book reading has been documented as a common family literacy practice for middle-class Caucasian families (Sonnenschein & Munsterman, 2002). Children from economically disadvantaged families often demonstrate language delays when they enter kindergarten (Fagan & Iglesias, 2000; Kaiser, Hancock, Cai, Foster, & Hester, 2000; McLoyd, 1998; Sénéchal & LeFevre, 2002). When low-income children are exposed to literacy learning opportunities (e.g., getting library cards, having access to books at home), the children who are successful readers in low-income families resemble the children in middle-class families (Sénéchal & LeFevre, 2002). Research on low-income Head Start families also suggests a positive association between shared book reading and Head Start children's literacy and language skills (Bracken & Fischel, 2008). The learning opportunities and literacy experiences at home appear to compensate for the disadvantages that result from poverty among low-income Head Start children. Overall, findings from prior studies suggest that the home literacy environment facilitates young children's language development through exposure to literacy activities.

## APPROACHES TO LEARNING AND LANGUAGE DEVELOPMENT

The concept of *approaches to learning* has been used to describe various learning behaviors that children demonstrate in a given learning context—that is, how children learn, rather than what children learn (Fantuzzo, Perry, & McDermott, 2004). Children's approaches to learning include four components: initiative, curiosity, engagement and persistence, and reasoning and problem solving (Bulotsky-Shearer, Fernandez, Dominguez, & Rouse, 2011; Hyson, 2005). Approaches to learning are observable and can be shaped by interventions (Domínguez, Vitiello, Fuccillo, Greenfield, & Bulotsky-Shearer, 2011). In addition, positive approaches to learning can promote learning in other developmental domains, such as cognitive ability, social competence, and so forth (McWayne, Fantuzzo, & McDermott, 2004).

Evidence suggests that children with positive learning behaviors tend to show interest in and a positive attitude toward reading and have high self-efficacy in reading (Tseng & Schmitt, 2008). Children's positive learning attitude and persistence are significantly related to higher levels of vocabulary skills (Fantuzzo, McWayne, Perry, & Childs, 2004). When children are

motivated to read and have a positive self-concept as a reader, they are more likely to perform better on vocabulary and comprehension tests (Al-Badawi, Ghaith, & Shaaban, 2006; Tseng & Schmitt, 2008). Home literacy activities, such as joint book reading, can increase children's motivation to read through positive parent–child interactions around print (Sonnenschein & Munsterman, 2002). Positive affect demonstrated during joint book reading can help support children to become motivated readers, thereby acquiring vocabulary skills (Merlo, Bowman, & Barnett, 2007; Sonnenschein & Munsterman, 2002). Similarly, classrooms in which children are engaged in various activities (e.g., painting, solving mathematics problems) can promote learning-related skills, as different classroom activities require different learning skills (Chen, Masur, & McNamee, 2011).

Why would approaches to learning be associated with language development? Approaches to learning can function as a keystone variable, a protective factor, or an instigator that facilitates early language growth (Hyson, 2008). As a keystone variable, positive approaches to learning can promote and strengthen learning in the language domain (Barnett, Bauer, Ehrhardt, Lentz, & Stollar, 1996). Positive approaches to learning can facilitate vocabulary and comprehension skills (Al-Badawi et al., 2006; Tseng & Schmitt, 2008), increase expressive and receptive vocabulary (Turner & Johnson, 2003), and promote letter and word recognition at sixth grade (McClelland, Acock, & Morrison, 2006) through motivation and interest to read, positive self-concept as a reader, and mastery motivation (i.e., intrinsic motivation to master a skill without external rewards). As a protective factor, positive approaches to learning can buffer young children against the negative effect of various risks (e.g., poverty, family violence) on language development when children engage in cooperative learning, focused attention, and so on (Hyson, 2008). Research suggests that positive approaches to learning, measured by positive learning attitude and persistence, can mitigate the negative influence of poverty on low-income Head Start children's vocabulary skills (Fantuzzo, McWayne, et al., 2004). Finally, positive approaches to learning can give rise to a cycle of positive achievement-related outcomes (Hyson, 2008). Positive approaches to learning can promote children's language learning and development through positive reinforcement (e.g., encouragement) from parents or teachers. These children may receive additional learning opportunities, because children with positive approaches to learning tend to be perceived as more teachable. The positive reinforcement and additional learning opportunities can help children gain more vocabulary knowledge.

## APPROACHES TO LEARNING AS A MODERATOR

According to the child–environment fit model, the effect of a family environment on children's development partly depends on children's characteristics (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Kochanska, 1993). Children's characteristics can shape or moderate the nature of the interactions between a child and a given environment, thereby altering the subsequent developmental trajectory (Pomerantz, Grolnick, & Price, 2005; Rutter, 1997). The present study focuses on approaches to learning as a child attribute that moderates the effect of family literacy environment on language development. The particular ways in which a child approaches learning a story, letter–sound knowledge, and so forth can be a factor that influences the frequency with which the child engages in literacy activities at home and the quality of that engagement. Research points out that children with higher levels of interest and engagement are

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more likely to ask their parents to read to them, suggesting that family literacy practices depend on children's learning behaviors (Dale, Crain-Thoreson, & Robinson, 1995; Scarborough, Dobrich, & Hager, 1991; Yuet-Han Lau & McBride-Chang, 2005). Moreover, research suggests that the positive effect of family literacy environment may be particularly influential for children with less positive approaches to learning, as these children may be more sensitive and susceptible to parental influence than children with positive approaches to learning (Pomerantz, Moorman, & Litwack, 2007). Consequently, children with less positive approaches to learning may gain more from exposure to literacy activities at home.

In the present study, children's approaches to learning functioned as a moderating factor that influenced the association between home literacy environment and children's English receptive vocabulary. A moderating effect occurs when the strength and/or the directionality of the relation between the independent variable and the dependent variable is influenced by a third variable (Baron & Kenny, 1986). The present study examined whether the relation between home literacy environment and children's English receptive vocabulary varies across levels of children's approaches to learning.

## THE PRESENT STUDY

National studies present an opportunity to conduct secondary analysis with a large sample of longitudinal data to examine developmental patterns (Burchinal, 1999). This study conducted secondary data analysis by using the Head Start Family and Child Experiences Survey (FACES 2003 cohort), a nationally representative sample of Head Start children, to address the research goal in the present study. This study examined whether approaches to learning moderates the effect of home literacy environment on English receptive vocabulary development. Specifically, this study asked the following: (a) Does home literacy environment influence the initial value of and changes over time in English receptive vocabulary? (b) Does approaches to learning influence the initial value of and changes over time in English receptive vocabulary? and (c) Does approaches to learning emerge as a potential moderator? The interaction term between approaches to learning and home literacy environment was evaluated to examine the moderating effect. Head Start children's English receptive vocabulary across four time points was modeled using latent growth curve modeling (LGCM). Home literacy environment, approaches to learning, and the interaction term were modeled as predictors to estimate their influence on the intercept and the growth factors.

#### METHOD

#### Data Source

This study used data from the FACES 2003 cohort (U.S. Department of Health and Human Services, 2002). The FACES 2003 cohort was a nationally representative longitudinal study that examined the cognitive, emotional, social, and physical development of Head Start children in the United States, as well as family characteristics and well-being, the quality of Head Start programs and classrooms, and characteristics of Head Start teachers and program staff.

## Procedure

The FACES 2003 cohort was selected from a national probability sample of 1,669 Head Start programs. The Head Start programs were stratified by region of the country (Northeast, Midwest, South, and West), urbanicity (whether the Head Start program was located in an urban area or a rural area), and the percentage of minority families in the program (50% or more vs. less than 50% minority enrollment). The following Head Start programs were excluded: migrant and seasonal Head Start programs, American Indian/Alaska Native Head Start programs, Early Head Start programs, programs in U.S. territories, and programs that did not serve children directly. The sampling procedure resulted in 63 Head Start programs selected from the 1,669 programs that participated in FACES 2003.

FACES 2003 included four waves of data collection (Fall 2003, Spring 2004, Spring 2005, and Spring 2006). Children and families were randomly selected from the Head Start classrooms at initial program entry in Fall 2003 and followed until the first year of kindergarten in Spring 2006. The parents' response rate in Fall 2003 was 94%. The teachers' response rate in Fall 2003 was 96%. The children's response rates across the four measurement occasions were 93%, 88%, 75%, and 73%. Detailed information about the FACES 2003 cohort study design can be found in the FACES reports (Zill, Kim, Sorongon, Shapiro, & Herbison, 2008; Zill, Sorongon, Kim, Clark, & Woolverton, 2006).

#### Participants

The children's mean age at program entry was 4 years old (range = 2.92-5.25 years). The data represented 2,611 families with an average annual family income of \$16,457.75 (SD = 12,396.828). The mothers' mean age was 37.63 years old (SD = 6.24) at Wave 1. The participating children and the parents had diverse racial and ethnic backgrounds, education levels, marital statuses, and family structures. Table 1 contains more detailed information regarding the characteristics of the participants.

Variable	n	М	SD	Range
Maternal characteristics				
Marital status (% married)	1,711	41.0%		
Education (% high school and above)	1,707	67.0%		
Race/ethnicity (% White)	1,717	33.7%		
Family characteristics				
Family structure (% two parents)	1,717	47.8%		
Home literacy environment	1,722	1.68	0.16	1.18-2.09
Reading materials at home	1,717	9.15	1.53	7-14
Family annual income	1,638	\$16,457.75	12,396.83	\$600-\$11,0271
Child characteristics				
Gender (% female)	1,778	35.0%		
Race/ethnicity (% White)	1,717	29.2%		
DLL (% DLL)	1,719	21.6%		
Approaches to learning	1,725	37.46	7.90	7–48

 TABLE 1

 Descriptive Statistics of the Participants in the Sample at Program Entry

Note. DLL = dual language learner.

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#### Measures

*English receptive vocabulary.* The English assessment of the Peabody Picture Vocabulary Test (PPVT-III) was used to assess children's English receptive vocabulary in Fall 2003, Spring 2004, Spring 2005, and Spring 2006 (Dunn & Dunn, 1997). The children were asked to point to one of four pictures that showed the meaning of a word spoken by the researcher. The format of the PPVT-III is appropriate for testing preschoolers' English receptive vocabulary. The PPVT-III has been shown to have acceptable split-half reliability and test–retest reliability. In the FACES 2003 cohort, the reliabilities of the PPVT-III for the four measurement occasions ranged from .84 to .91. The standard score with a mean of 100 and a standard deviation of 15 was used in this study.

*Home literacy environment.* Home literacy environment was measured with 22 items in Fall 2003. Parents or the child's primary caretaker self-reported the range of literacy-related practices that they provided or engaged in with their children. Specifically, the 22 items measured the parents' or the primary caretaker's teaching and reading behaviors, providing literacy activities both in and outside of the home environment, and making literacy materials accessible for the children. Sample items included "Have you or someone in the family told the child a story in the past week?" "Have you or someone in the family taught the child letters, words, or numbers in the past week?" "Have you or someone in the family played counting games, for instance, singing songs with numbers or reading books with numbers, with the child in the past week?" and "Have you or someone in the family visited the library, art gallery, or museums with the child in the past month?" The parents or the child's primary caretaker responded to each item with a yes/no answer. The 22 items were recoded and averaged so that higher scores represented higher levels of home literacy environment. Cronbach's alpha for home literacy environment in Fall 2003 was .69. In the present study, the test–retest reliability of the home literacy environment scale across the four time points ranged from .49 to .60.

Approaches to learning. Teachers completed the Preschool Learning Behaviors Scale (PLBS) for children's approaches to learning in Spring 2003 (McDermott, Green, Francis, & Stott, 2000). The PLBS included three subscales: competence motivation, persistence/attention, ntion, and attitude toward learning. The subscale of competence motivation included 11 questions that measured children's ability to master a task. Sample questions included "Show interest in activity," "Say tasks are too hard," and "Give up easily on activity." The persistence/ attention subscale included nine questions to measure children's tendency to continue working on a task regardless of the level of difficulty of the task. Sample questions included "Stick to activity," "Concentration soon fades," and "Distract too easily." The subscale of attitude toward learning used seven questions to measure children's positive and negative learning attitude and behaviors. Sample questions included "Little desire to please," "Unwilling to accept help," and "Cooperates in group activities." Competence motivation, persistence/attention, and attitude toward learning were measured on a scale of 1 (not true) to 3 (very true or often true). Higher scores represented more positive approaches to learning. This study used the total scale of approaches to learning because the subscales were strongly correlated at and above .60. The PLBS has acceptable concurrent validity, predictive validity, and test-retest reliability (Schaefer, Shur, Macri-Summers, & MacDonald, 2004). The scale has adequate convergent and divergent validity (McDermott, Leigh, & Perry, 2002). The PLBS has also been validated with samples of Head Start children (McDermott, Rikoon, Waterman, & Fantuzzo, 2012; Rikoon, McDermott, & Fantuzzo, 2012). Cronbach's alpha for approaches to learning in Fall 2003 was .90.

*Covariates.* The following demographic covariates were used as control variables: child age, child gender (FEMALE: 0 = male, 1 = female), child race/ethnicity (WHITE: 0 = other, 1 = White), child dual language learner (DLL: 0 = no, 1 = yes), other language(s) spoken at home (1 = yes, 2 = no), mother's education, family annual income, and amount of reading materials at home. Given that the sample in the present study included Head Start children who were dual language learners and who spoke language(s) other than English at home, children's status as dual language learners and whether they spoke other languages at home were included as covariates, as research demonstrates that the language spoken at home is associated with children's language development (Boyce, Gillam, Innocenti, Cook, & Ortiz, 2013). Mother's education was included as a control variable, as research showed that maternal education was a significant predictor of children's language skills (Korat, 2009). The amount of reading materials available at home was also included as a control variable, as exposure to print is linked to early language skills (Cunningham & Stanovich, 1998). Parents responded "yes" or "no" to the seven questions that asked whether they had the following reading materials at home: comic books, magazines for children, magazines for adults, newspapers, catalogs, religious books, and dictionaries/ encyclopedias. A composite measure of reading materials at home was created by summing across the seven items. Higher scores indicated more reading materials available at home.

## Analytic Strategy

This study used LGCM implemented in Mplus Version 7 to estimate the developmental trajectory of English receptive vocabulary. LGCM examines developmental trajectories by estimating growth factors (i.e., intercept, slope) as latent variables and allowing for the incorporation of time-varying and time-invariant variables as covariates (Preacher, Wichman, MacCallum, & Briggs, 2008). LGCM allows researchers to test the mean intercept and the mean growth rate to reflect the average trajectory of development (Preacher et al., 2008). Figure 1 depicts the outcome variable being modeled using LGCM. As shown in Figure 1, the intercept was fixed at 1. The time scores of the linear slope were specified as 0, 1, 2, and 3. The time scores of the quadratic slope were specified as 0, 1, 4, and 9. The intercept was defined by the 0 time score of the linear slope at Time 1 as the initial status at program entry. The linear slope and the quadratic slope were modeled as the linear change and the nonlinear change across time. The intercept, the linear slope, and the quadratic slope as the three latent growth factors were regressed on the predictors, the covariates, and the interaction term. To increase model fit and model convergence, the residual variances and the covariances of the three latent growth factors were fixed at 0. Because the variances of the growth factors were found to be negative, indicating no individual variations on the growth factors, the growth factors were treated as fixed variables by fixing them to be 0.

#### Missing Data

The missing pattern analysis showed that approximately 16% of participants (n = 398) had complete data on all variables; 36% of participants (n = 912) had missing data on one variable.



FIGURE 1 Hypothesized latent growth curve modeling of English receptive vocabulary with the three latent growth factors regressed on home literacy environment, approaches to learning, and the interaction term.

The rest of the participants had missing data on two or more variables. No participants had missing data on all variables. Little's missing completely at random test conducted in SPSS Version 20 with the expectation-maximization method showed that the missing data in the outcome variable, the predictors, and the covariates were missing completely at random,  $\chi^2(1, n = 2611) = 3.32, p = .07$ . The missing data were then handled in the Mplus program by a full information maximum likelihood estimation under the assumption that the missingness was either missing at random or missing completely at random (Arbuckle, 1996; Little, 1995). Full information maximum likelihood estimation is a widely acceptable estimation method that uses all available information in the data (Muthén & Shedden, 1999). Thus, children who had data at one time point and who completed the PPVT-III at any given time point were included in the analyses.

## RESULTS

The first step in modeling the developmental trajectory of English receptive vocabulary was to determine the shape of the trajectory. Both the linear and the quadratic models of English receptive vocabulary were estimated using maximum likelihood estimation with robust standard

Variable	1	2	3	4	5	6
1. PPVT 2003		.69**	.58**	.64**	.22**	.10**
2. PPVT 2004			.65**	.68**	.23**	.12**
3. PPVT 2005				.68**	.17**	.14**
4. PPVT 2006					.16**	.15**
5. Approaches to learning						.08**
6. Home literacy environment						
M	85.08	86.30	89.15	89.88	37.46	1.68
SD	12.04	12.11	13.63	14.44	7.90	0.16

TABLE 2 Correlations, Means, and Standard Deviations for the Variables of Interest (N=2,611)

*Note*. PPVT = Peabody Picture Vocabulary Test. \*\*p < .01.

errors. The Bayesian information criterion (BIC) was used to determine whether the quadratic model was a better model than the linear model. According to Raftery (1995), a BIC difference between two models greater than 10 is very strong evidence that the model with the smaller BIC is the better fitting model. Results showed that the BIC difference between the linear model (BIC = 61,528.61) and the quadratic model (BIC = 49,636.75) of English receptive vocabulary was greater than 10. Because the quadratic models of English receptive vocabulary had smaller BIC values, the quadratic model was selected for subsequent analyses.

Table 2 shows the correlations, the means, and the standard deviations of the predictors and the outcome variables. The correlation coefficients showed that home literacy environment and approaches to learning correlated positively with English receptive vocabulary across the four time points. However, the magnitudes of the correlation coefficients were not large. Because the correlation analysis only considered the linear relation between a pair of variables, LGCM was utilized to examine the mean trajectory and the rate of change. The quadratic model appeared to fit the data well,  $\chi^2(16, n = 2611) = 475.59$ , p < .00; comparative fit index = .94; root mean square error of approximation = .07, 90% confidence interval = (.07, .08); standardized root-mean-square residual = .05.

## LGCM of English Receptive Vocabulary

Table 3 shows that the English receptive vocabulary intercept (i.e., the English receptive vocabulary score at initial program entry) was significantly and positively associated with home literacy environment (B = 3.80, p < .05).and approaches to learning (B = 0.33, p < .001) after child and parent demographic covariates were controlled. For a 1 unit increase in home literacy environment, there was a 3.80 unit increase in Head Start children's initial English receptive vocabulary. Similarly, for a 1 unit increase in approaches to learning, there was a 0.33 unit increase in Head Start children's initial English receptive vocabulary. Home literacy environment (B = -1.32, p > .05) and approaches to learning (B = 0.06, p > .05) were not significantly associated with the linear slope of English receptive vocabulary.

With respect to the covariates, Caucasian children scored higher on English receptive vocabulary than children of other races/ethnicities at program entry (B = 8.22, p < .001). Dual

	Intercept	Linear Slope	Quadratic Slope Estimate <sup>a</sup> (SE)	
Variable	<i>Estimate<sup>a</sup></i> (SE)	Estimate <sup>a</sup> (SE)		
Child age	-0.06 (0.04)	0.03 (0.05)	-0.02 (0.02)	
Child gender (female)	0.25 (0.53)	0.17 (0.65)	-0.07 (0.20)	
Child race/ethnicity (White)	8.22*** (0.59)	0.03 (0.74)	0.02 (0.23)	
DLL	$-14.66^{***}$ (1.07)	5.64*** (1.30)	$-1.80^{***}$ (0.39)	
Home language	0.23 (0.78)	0.33 (0.94)	-0.22 (0.29)	
Reading materials at home	-0.12 (0.20)	0.21 (0.24)	-0.06 (0.07)	
Family annual income	0.00** (0.00)	0.00 (0.00)	-0.00 (0.00)	
Mother's education	1.18*** (0.20)	0.24 (0.27)	-0.06 (0.08)	
HLE	3.80* (1.92)	-1.32 (2.24)	0.46 (0.69)	
AL	0.33*** (0.04)	0.06 (0.05)	-0.02 (0.01)	
$HLE \times AL$	-0.00 (0.01)	-0.30* (0.15)	0.12* (0.05)	

TABLE 3 Quadratic Model of English Receptive Vocabulary

Note. DLL = dual language learner; HLE = home literacy environment; AL = approaches to learning.

<sup>a</sup>Estimates are unstandardized betas.

\*p < .05. \*\*p < .01. \*\*\*p < .001.

language learners showed lower English receptive vocabulary skills at program entry (B = -14.66, p < .001), but they demonstrated more growth (B = 5.64, p < .001) than non-dual language learners. With respect to family annual income and mother's education, for a 1 unit increase in family annual income, there was a 0.00 unit increase in Head Start children's English receptive vocabulary (B = 0.00, p < .01). Likewise, for a 1 unit increase in mother's education, there was a 1.18 increase in Head Start children's English receptive vocabulary (B = 1.18, p < .001). These results indicated that Caucasian non-dual language learners who came from families with a higher annual income and had mothers with higher levels of education scored higher on English receptive vocabulary than their counterparts upon program entry. The other covariates were not significant.

#### The Moderating Effect of Approaches to Learning

The interaction term between home literacy environment and approaches to learning emerged as a significant predictor of the English receptive vocabulary linear slope (B = -0.30, p < .05) after child and parent demographic covariates were controlled. Specifically, the effect of home literacy environment on the English receptive vocabulary linear slope depended on children's approaches to learning. The significant negative interaction term suggested that home literacy environment tended to be positively associated with English receptive vocabulary for children who had less positive approaches to learning.

Given that a significant interaction term for the English receptive vocabulary linear slope emerged, post hoc probing of the significant interaction term was performed by testing the simple slope and plotting the trajectories (Preacher, Curran, & Bauer, 2006). Following guidelines put forth by Preacher et al. (2006), both home literacy environment and approaches to learning were first centered on the mean to reduce collinearity between approaches to learning and home



FIGURE 2 English receptive vocabulary trajectories on high/low home literacy environment (HLE) and high/low approaches to learning (AL).

literacy environment. Then two conditions (1 SD above the mean and 1 SD below the mean) of home literacy environment and approaches to learning were created, resulting in four possible combinations of home literacy environment and approaches to learning. Finally, the English receptive vocabulary linear slope was regressed on the conditional high values (1 SD above the mean) and low values (1 SD below the mean) of home literacy environment and approaches to learning. The results of the post hoc probing, shown in Figure 2, showed that the children with more positive approaches to learning and lower levels of home literacy environment scored higher on English receptive vocabulary (simple slope = -5.72, p < .05) than the children with less positive approaches to learning and higher levels of home literacy environment (simple slope = -5.28, p < .01). The children with more positive approaches to learning and higher levels of home literacy environment appeared to have the steepest slope, but the simple slope was not significant (simple slope = -6.17, p > .05). Children who had less positive approaches to learning and lower levels of home literacy environment had the lowest English receptive vocabulary (simple slope = -5.55, p < .01). These results suggested a complementary effect between approaches to learning and home literacy environment. Specifically, children's positive approaches to learning compensate for the effect of lower levels of home literacy environment on the English receptive language trajectory. Likewise, higher levels of home literacy environment compensate for the negative effect of less positive approaches to learning on the English receptive language trajectory.

#### DISCUSSION

This study asked whether children's approaches to learning moderate the effect of home literacy environment on English receptive vocabulary development. This study extends previous research by examining whether the association between home literacy environment and English receptive vocabulary differs based on children's approaches to learning. This study used a

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nationally representative sample of Head Start children with multiple informants (i.e., parents, teachers, and children) to address the research goal.

## Home Literacy Environment and Approaches to Learning

The present study revealed that home literacy environment and approaches to learning positively predicted Head Start children's English receptive vocabulary at program entry. Young children, particularly low-income children, who are exposed to literacy experiences at home demonstrate more language competencies (Crain-Thoreson & Dale, 1992; Frijters et al., 2000; Whitehurst & Lonigan, 1998). Consistent with previous research (Isbell et al., 2004; Phillips, Norris, & Anderson, 2008; Sonnenschein & Munsterman, 2002), this study's findings provided additional evidence that home literacy environment can contribute to language competencies among the population of Head Start children upon program entry, even when children's demographic variables, home language, mother's education, family annual income, and the amount of reading materials at home are controlled.

In addition, approaches to learning emerged as a significant predictor of Head Start children's English receptive vocabulary at program entry. Previous research suggests that approaches to learning can facilitate learning in other developmental domains, including language development (McWayne et al., 2004). Furthermore, approaches to learning has been linked to Head Start children's school readiness (Vitiello, Greenfield, Munis, & George, 2011). This study contributes to the limited existing research by providing initial evidence that supports the association between approaches to learning and English receptive vocabulary. At a preliminary level, this finding suggests that young children's learning behaviors (e.g., focused attention, cooperative learning) may be involved in the process of acquiring vocabulary and word knowledge. However, given the large sample size of this study, the significant linkages among home literacy environment, approaches to learning, and English receptive vocabulary need to be interpreted with the sample size in mind.

# Approaches to Learning as a Moderating Factor

Previous research suggests that home literacy environment is associated with an increase in children's phonological awareness, letter–sound relationships, grammatical knowledge, interest, listening skills, comprehension, and vocabulary skills (e.g., Crain-Thoreson & Dale, 1992; Evans, Shaw, & Bell, 2007; Frijters et al., 2000; Phillips et al., 2008; Whitehurst & Lonigan, 1998). The main goal of this study was to understand whether the association between home literacy environment and children's English receptive vocabulary depends on approaches to learning. Evidence from the present study demonstrated that approaches to learning moderated the effect of home literacy environment on English receptive vocabulary. When home literacy environment and approaches to learning were jointly considered, more positive approaches to learning predicted more English receptive vocabulary when children were exposed to limited literacy at home. In other words, positive approaches to learning appeared to function as a protective factor for limited literacy exposure at home. In particular, when there are limited literacy exposure. Research shows that children with limited literacy exposure at home are likely to fall behind their counterparts in kindergarten (Whitehurst & Lonigan, 1998). This study

demonstrated that even though the children might have had limited exposure to literacy activities and experiences at home, those with more positive approaches to learning were more likely to score higher on English receptive vocabulary. This is perhaps because children with more positive approaches to learning tend to ask more questions, explore on their own, request more book reading, and pay greater attention to conversations and stories, thereby exposing themselves to English vocabulary and word knowledge. This finding underscores the important role of approaches to learning in shaping children's language development in the presence of a limited home literacy environment. This finding also corroborates prior research evidence that shows that children who are motivated and engaged tend to bring a wealth of cognitive strategies (e.g., problem solving) into learning situations in which they are asked to solve moderately challenging tasks, which may result in an increase in their literacy and language skills (Baker, Mackler, Sonnenschein, & Serpell, 2001; Merlo et al., 2007; Sonnenschein & Munsterman, 2002). Findings from this study suggested that positive approaches to learning functioned as a buffer to protect children from the negative effect of limited literacy exposure at home.

Findings also reveal that children with less positive approaches to learning gain English vocabulary skills when they are exposed to more literacy activities and experiences at home. Even though children with less positive approaches to learning may not demonstrate positive learning behaviors (e.g., curiosity, engagement), providing literacy experiences (e.g., going to the library) or literacy activities (e.g., shared book reading) for these children will allow them to learn words and vocabulary in English. It is possible that children who are less motivated and less engaged are more susceptible to environmental input. These children may not be completely lacking motivation to learn; rather, they may need an extra push to support their learning. Providing language and print activities at home, such as reading children a storybook and engaging in a language game (e.g., rhyming), becomes especially important for children with less positive approaches to learning. Therefore, exposing children who are less engaged to literacy activities and opportunities is essential. Finally, children who do not approach a given learning situation with positive learning behaviors and who are exposed to limited literacy experiences at home are more likely to lag behind their counterparts in language competencies.

Given the large sample size in this study, approaches to learning as a significant moderator needs to be interpreted with the sample size in mind. Nevertheless, the findings are consistent with previous research with respect to the influence of home literacy environment and children's approaches to learning on young children's language competencies (Barnett & Ratner, 1997; Sénéchal, 2006). This study further extends prior research by demonstrating that the influence of home literacy environment on young children's language competencies depends on children's approaches to learning. Positive approaches to learning can function as a protective factor for children who are exposed to limited literacy experiences at home. However, home literacy environment can become a buffer for children who do not demonstrate positive approaches to learning. It should be noted that when children's and families' demographic variables were taken into account, child race/ethnicity, dual language learner status, family annual income, and mother's education emerged as significant covariates. Specifically, Caucasian children demonstrated higher levels of English receptive vocabulary than children of other races/ethnicities at program entry. Even though dual language learners scored lower on English receptive vocabulary when they entered Head Start programs, they showed more growth in English receptive vocabulary than their counterparts. Moreover, children who came from families with a higher family annual income and had mothers with more education demonstrated higher English receptive vocabulary at program entry.

## Limitations

It is important to note that the information regarding home literacy environment and children's approaches to learning was collected through parent-report and teacher-report measures. The use of multiple informants to assess the variables of interest in this study presents valid measures of the study phenomenon and partially minimizes shared method variance. However, some limitations and caveats of this study need to be mentioned. First, this study was not an experimental study to draw firm causal inferences regarding the relation between the predictors and children's English receptive vocabulary. It is possible that parents may perceive children with positive approaches to learning as independent learners who do not need additional literacy support. However, children with less positive approaches to learning may be the ones who need additional literacy support from their parents. The mechanisms through which children's approaches to learning influence their exposure to literacy experiences at home are not well understood. Further investigation regarding the bidirectional relation between approaches to learning and home literacy exposure is needed. Second, approaches to learning was assessed at one measurement occasion. Young children's approaches to learning may develop and change throughout the early childhood period. Future research needs to investigate the developmental trajectories of approaches to learning and the conditions under which parents and educators can foster positive approaches to learning. Examining the parallel processes of changes in approaches to learning and home literacy environment and subsequent language development will extend future research. In addition, research has linked home literacy environment with dual language learners' English and Spanish language abilities (Boyce et al., 2013). More effort needs to be paid to understanding how culturally relevant family literacy practices and children's learning behaviors play a role among low-income dual language learners who come from diverse cultural and linguistic backgrounds. Finally, this study used a variablecentered analytical approach. Future research will benefit from using a person-centered approach to examine similar research questions by understanding which at-risk Head Start children would benefit the most from engaging in positive approaches to learning and exposure to literacy at home.

#### Implications

This study extends current understanding with respect to approaches to learning as a factor that moderates the effect of home literacy environment on Head Start children's English receptive vocabulary development. As a dimension of school readiness, approaches to learning is the least understood and investigated (Hyson, 2008). It is important to note that this study serves as a guiding point for future research to further investigate approaches to learning as a dimension of school readiness. Specifically, attention needs to be paid to understanding how approaches to learning can be nurtured in the home context to prepare children to learn language-related school readiness skills. Approaches to learning has been considered an essential set of skills that can enhance learning in other developmental domains (Hyson, 2008). Future investigations that explicate the interplay between approaches to learning and home literacy environment can offer insight with respect to how the developmental processes of approaches to learning unfold over time in the family context.

Understanding how approaches to learning functions as a mechanism to prepare young children for effective learning and knowledge acquisition can have implications for Head Start programs and teachers in terms of nurturing positive approaches to learning. Head Start teachers may want to particularly target at-risk children's learning behaviors to support early language competencies. For example, encouraging at-risk children to be creative and persistent through play activities may help these children develop positive attitudes and predispositions toward learning. Engaging at-risk children in cooperative learning through group activities or having the children work in pairs can be another way to foster positive learning attitudes and behaviors. Understanding how children learn, in addition to what children learn, can have implications for Head Start programs in terms of identifying children who are disengaged and disinterested and providing early interventions to disrupt factors (e.g., teaching methods) that may undermine children's positive approaches to learning (Hyson, 2008).

Early childhood is the period when children are rapidly expanding their language capacities. Intervention and prevention programs are likely to direct attention to what children should be learning and what teaching methods are better for increasing children's learning outcomes (C. E. Snow, 1983). Less effort has been made to focus on how children learn. Because approaches to learning is considered to be a crucial element that lays the foundation for learning in other developmental domains, there is a heightened need to cultivate approaches to learning, especially for children who lack motivation to learn. Gaining further understanding of how best to support and promote children's approaches to learning and the contexts in which positive approaches to learning are likely to occur can have long-term consequences for later school success.

## REFERENCES

- Al-Badawi, G., Ghaith, G., & Shaaban, K. (2006). An initial study of the effects of cooperative learning on reading comprehension, vocabulary acquisition, and motivation to read. *Reading Psychology*, 27, 377–403. doi:10.1080/ 02702710600846613
- Anglin, J. M. (1989). Vocabulary growth and the knowledge-learning distinction. Reading Canada, 7, 142-146.
- Anglin, J. M. (1993). Vocabulary development: A morphological analysis. Monographs of the Society for Research in Child Development, 58(10), v–165.
- Aram, D. (2006). Early literacy interventions: The relative roles of storybook reading, alphabetic activities, and their combination. *Reading and Writing*, 19, 489–515. doi:10.1007/s11145-006-9005-2
- Arbuckle, J. L. (1996). Full information estimation in the presence of incomplete data. In G. A. Marcoulides & R. E. Schumacker (Eds.), Advanced structural equation modeling: Issues and techniques (pp. 243–277). Hillsdale, NJ: Erlbaum.
- Baker, L., Mackler, K., Sonnenschein, S., & Serpell, R. (2001). Parents' interactions with their first-grade children during storybook reading and relations with subsequent home reading activity and reading achievement. *Journal of School Psychology*, 39, 415–438. doi:10.1016/s0022-4405(01)00082-6
- Barnett, D. W., Bauer, A. M., Ehrhardt, K. E., Lentz, F. E., & Stollar, S. A. (1996). Keystone targets for change: Planning for widespread positive consequences. *School Psychology Quarterly*, 11, 95–117. doi:10.1037/h0088923
- Barnett, D., & Ratner, H. H. (1997). The organization and integration of cognition and emotion in development. *Journal of Experimental Child Psychology*, 67, 303–316. doi:10.1006/jecp.1997.2417
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182. doi:10.1037/0022-3514.51.6.1173
- Bierman, K. L., Domitrovich, C. E., Nix, R. L., Gest, S. D., Welsh, J. A., Greenberg, M. T., ... Gill, S. (2008). Promoting academic and social-emotional school readiness: The Head Start REDI program. *Child Development*, 79, 1802–1817. doi:10.1111/j.1467-8624.2008.01227.x
- Boyce, L. K., Gillam, S. L., Innocenti, M. S., Cook, G. A., & Ortiz, E. (2013). An examination of language input and vocabulary development of young Latino dual language learners living in poverty. *First Language*, 33, 572–593. doi:10.1177/0142723713503145
- Bracken, S. S., & Fischel, J. E. (2008). Family reading behavior and early literacy skills in preschool children from low-income backgrounds. *Early Education & Development*, 19, 45–67. doi:10.1080/10409280701838835

- Britto, P. R., Brooks-Gunn, J., & Griffin, T. M. (2006). Maternal reading and teaching patterns: Associations with school readiness in low-income African American families. *Reading Research Quarterly*, 41, 68–89. doi:10.1598/ RRQ.41.1.3
- Bulotsky-Shearer, R. J., Fernandez, V., Dominguez, X., & Rouse, H. L. (2011). Behavior problems in learning activities and social interactions in Head Start classrooms and early reading, mathematics, and approaches to learning. *School Psychology Review*, 40, 39–56.
- Burchinal, M. R. (1999). Statistical methods for describing developmental patterns. *Early Education & Development*, 10, 83–99. doi:10.1207/s15566935eed1001\_6
- Burchinal, M. R., Peisner-Feinberg, E., Pianta, R., & Howes, C. (2002). Development of academic skills from preschool through second grade: Family and classroom predictors of developmental trajectories. *Journal of School Psychology*, 40, 415–436. doi:10.1016/S0022-4405(02)00107-3
- Burgess, S. R. (2002). The influence of speech perception, oral language ability, the home literacy environment, and pre-reading knowledge on the growth of phonological sensitivity: A one-year longitudinal investigation. *Reading* and Writing, 15, 709–737. doi:10.1023/a:1020954606695
- Burgess, S. R. (2011). Home literacy environments (HLEs) provided to very young children. Early Child Development and Care, 181, 445–462. doi:10.1080/03004430903450384
- Bus, A. G., van Ijzendoorn, M. H., & Pellegrini, A. D. (1995). Joint book reading makes for success in learning to read: A metaanalysis on intergenerational transmission of literacy. *Review of Educational Research*, 65, 1–21. doi:10.2307/1170476
- Chazan-Cohen, R., Raikes, H., Brooks-Gunn, J., Ayoub, C., Pan, B. A., Kisker, E. E., ... Fuligni, A. S. (2009). Low-income children's school readiness: Parent contributions over the first five years. *Early Education & Development*, 20, 958–977. doi:10.1080/10409280903362402
- Chen, J.-Q., Masur, A., & McNamee, G. (2011). Young children's approaches to learning: A sociocultural perspective. *Early Child Development and Care*, 181, 1137–1152. doi:10.1080/03004430.2010.520160
- Collins, W. A., Maccoby, E. E., Steinberg, L., Hetherington, E. M., & Bornstein, M. (2000). Contemporary research on parenting: The case for nature and nurture. *American Psychologist*, 55, 218–232.
- Crain-Thoreson, C., & Dale, P. S. (1992). Do early talkers become early readers? Linguistic precocity, preschool language, and emergent literacy. *Developmental Psychology*, 28, 421–429. doi:10.1037/0012-1649.28.3.421
- Cunningham, A. E., & Stanovich, K. E. (1998). The impact of print exposure on word recognition. In J. L. Metsala & L. C. Ehri (Eds.), Word recognition in beginning literacy (pp. 235–262). Mahwah, NJ: Erlbaum.
- Dale, P. S., Crain-Thoreson, C., & Robinson, N. M. (1995). Linguistic precocity and the development of reading: The role of extralinguistic factors. *Applied Psycholinguistics*, 16, 173–187. doi:10.1017/S0142716400007074
- Diesendruck, G. (2007). Mechanisms of word learning. In E. Hoff & M. Shatz (Eds.), Blackwell handbook of language development (pp. 257–276). Malden, MA: Oxford.
- Domínguez, X., Vitiello, V. E., Fuccillo, J. M., Greenfield, D. B., & Bulotsky-Shearer, R. J. (2011). The role of context in preschool learning: A multilevel examination of the contribution of context-specific problem behaviors and classroom process quality to low-income children's approaches to learning. *Journal of School Psychology*, 49, 175–195. doi:10.1016/j.jsp.2010.11.002
- Dunn, L. M., & Dunn, L. M. (1997). Peabody Picture Vocabulary Test, Third Edition: Examiner's manual and norms booklet. Circle Pines, MN: American Guidance Service.
- Evans, M. A., Shaw, D., & Bell, M. (2007). Home literacy activities and their influence on early literacy skills. *Canadian Journal of Experimental Psychology*, 54, 65–75. doi:10.1037/h0087330
- Fagan, J., & Iglesias, A. (2000). The relationship between fathers' and children's communication skills and children's behavior problems: A study of Head Start children. *Early Education & Development*, 11, 307–320. doi:10. 1207/s15566935eed1103\_5
- Fantuzzo, J., McWayne, C., Perry, M. A., & Childs, S. (2004). Multiple dimensions of family involvement and their relations to behavioral and learning competencies for urban, low-income children. School Psychology Review, 33, 467–480.
- Fantuzzo, J., Perry, M. A., & McDermott, P. (2004). Preschool approaches to learning and their relationship to other relevant classroom competencies for low-income children. *School Psychology Quarterly*, 19, 212–230. doi:10.1521/scpq.19.3.212.40276
- Farrant, B. M., & Zubrick, S. R. (2013). Parent–child book reading across early childhood and child vocabulary in the early school years: Findings from the Longitudinal Study of Australian Children. *First Language*, 33, 280–293.
- Fletcher, K. L., Cross, J. R., Tanney, A. L., Schneider, M., & Finch, W. H. (2008). Predicting language development in children at risk: The effects of quality and frequency of caregiver reading. *Early Education & Development*, 19, 89–111. doi:10.1080/10409280701839106

- Frijters, J. C., 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. doi:10.1037/0022-0663.92.3.466
- Hoff, E. (2006). How social contexts support and shape language development. Developmental Review, 26, 55–88. doi:10.1016/j.dr.2005.11.002
- Hyson, M. (2005). Strengthening young children's positive approaches to learning. Young Children, 60(6), 68-70.
- Hyson, M. (2008). *Enthusiastic and engaged learners: Approaches to learning in the early childhood classroom*. New York, NY: Teachers College Press.
- Isbell, R., Sobol, J., Lindauer, L., & Lowrance, A. (2004). The effects of storytelling and story reading on the oral language complexity and story comprehension of young children. *Early Childhood Education Journal*, 32, 157–163. doi:10.1023/BECEJ.0000048967.94189.a3
- Joe, E. M., & Davis, J. E. (2009). Parental influence, school readiness and early academic achievement of African American boys. *Journal of Negro Education*, 78, 260–276.
- Kaiser, A. P., Hancock, T. B., Cai, X., Foster, E. M., & Hester, P. P. (2000). Parent-reported behavioral problems and language delays in boys and girls enrolled in Head Start classrooms. *Behavioral Disorders*, 26, 26–41.
- Kochanska, G. (1993). Toward a synthesis of parental socialization and child temperament in early development of conscience. *Child Development*, 64, 325–347.
- Korat, O. (2009). The effect of maternal teaching talk on children's emergent literacy as a function of type of activity and maternal education level. *Journal of Applied Developmental Psychology*, 30, 34–42. doi:10.1016/j. appdev.2008.10.001
- Little, R. J. (1995). Modeling the dropout mechanism in repeated-measures studies. *Journal of the American Statistical Association*, 90, 1112–1121.
- McClelland, M. M., Acock, A. C., & Morrison, F. J. (2006). The impact of kindergarten learning-related skills on academic trajectories at the end of elementary school. *Early Childhood Research Quarterly*, 21, 471–490. doi:10.1016/j.ecresq.2006.09.003
- McDermott, P. A., Green, L. F., Francis, J. M., & Stott, D. H. (2000). Preschool Learning Behaviors Scale. Philadelphia, PA: Edumetric and Clinical Science.
- McDermott, P. A., Leigh, N. M., & Perry, M. A. (2002). Development and validation of the Preschool Learning Behaviors Scale. *Psychology in the Schools*, 39, 353–365. doi:10.1002/pits.10036
- McDermott, P. A., Rikoon, S. H., Waterman, C., & Fantuzzo, J. W. (2012). The Preschool Learning Behavior Scale: Dimensionality and external validity in Head Start. School Psychology Review, 41, 66–81.
- McLoyd, V. C. (1998). Socioeconomic disadvantage and child development. American Psychologist, 53, 185–204. doi:10.1037/0003-066x.53.2.185
- McWayne, C. M., Fantuzzo, J. W., & McDermott, P. A. (2004). Preschool competency in context: An investigation of the unique contribution of child competencies to early academic success. *Developmental Psychology*, 40, 633–645. doi:10.1037/0012-1649.40.4.633
- Merlo, L. J., Bowman, M., & Barnett, D. (2007). Parental nurturance promotes reading acquisition in low socioeconomic status children. *Early Education & Development*, 18, 51–69.
- Muthén, B., & Shedden, K. (1999). Finite mixture modeling with mixture outcomes using the EM algorithm. *Biometrics*, 55, 463–469.
- Neuman, S. B., & Celano, D. (2006). The knowledge gap: Implications of leveling the playing field for low-income and middle-income children. *Reading Research Quarterly*, 41, 176–201. doi:10.1598/rrq.41.2.2
- Phillips, L. M., Norris, S. P., & Anderson, J. (2008). Unlocking the door: Is parents' reading to children the key to early literacy development? *Canadian Psychology*, 49, 82–88. doi:10.1037/0708-5591.49.2.82
- Pomerantz, E. M., Grolnick, W. S., & Price, C. E. (2005). The role of parents in how children approach achievement: A dynamic process perspective. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 259–279). New York, NY: Guilford Press.
- Pomerantz, E. M., Moorman, E. A., & Litwack, S. D. (2007). The how, whom, and why of parents' involvement in children's academic lives: More is not always better. *Review of Educational Research*, 77, 373–410. doi:10.3102/003465430305567
- Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interactions in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics*, 31, 437–448.

- Preacher, K. J., Wichman, A. L., MacCallum, R. C., & Briggs, N. E. (2008). *Latent growth curve modeling*. Los Angeles, CA: Sage.
- Raftery, A. E. (1995). Bayesian model selection in social research. Sociological Methodology, 25, 111–163. doi:10.2307/271063
- Rikoon, S. H., McDermott, P. A., & Fantuzzo, J. W. (2012). Approaches to learning among Head Start alumni: Structure and validity of the Learning Behaviors Scale. *School Psychology Review*, 41, 272–294.
- Rutter, M. L. (1997). Nature-nurture integration: The example of antisocial behavior. *American Psychologist*, 52, 390–398. doi:10.1037/0003-066X.52.4.390
- Saracho, O. N. (2007). Fathers and young children's literacy experiences in a family environment. Early Child Development and Care, 177, 403–415. doi:10.1080/03004430600563034
- Scarborough, H. S., Dobrich, W., & Hager, M. (1991). Preschool literacy experience and later reading achievement. Journal of Learning Disabilities, 24, 508–511. doi:10.1177/002221949102400811
- Schaefer, B. A., Shur, K. F., Macri-Summers, M., & MacDonald, S. L. (2004). Preschool children's learning behaviors, concept attainment, social skills, and problem behaviors: Validity evidence for Preschool Learning Behaviors Scale scores. Journal of Psychoeducational Assessment, 22, 15–32. doi:10.1177/073428290402200102
- Sénéchal, M. (2006). Testing the home literacy model: Parent involvement in kindergarten is differentially related to Grade 4 reading comprehension, fluency, spelling, and reading for pleasure. *Scientific Studies of Reading*, 10, 59–87. doi:10.1207/s1532799xssr1001\_4
- Sénéchal, M., & LeFevre, J.-A. (2002). Parental involvement in the development of children's reading skill: A five-year longitudinal study. *Child Development*, 73, 445–460. doi:10.1111/1467-8624.00417
- Sénéchal, M., LeFevre, J.-A., 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, 96–116. doi:10.1598/rrq.33.1.5
- Sénéchal, M., Pagan, S., Lever, R., & Ouellette, G. P. (2008). Relations among the frequency of shared reading and 4-year-old children's vocabulary, morphological and syntax comprehension, and narrative skills. *Early Education* & *Development*, 19, 27–44.
- Snow, C. E. (1983). Literacy and language: Relationships during the preschool years. *Harvard Educational Review*, 53, 165–189.
- Snow, K. L. (2006). Measuring school readiness: Conceptual and practical considerations. Early Education & Development, 17, 7–41. doi:10.1207/s15566935eed1701\_2
- Sonnenschein, S., & Munsterman, K. (2002). The influence of home-based reading interactions on 5-year-olds' reading motivations and early literacy development. *Early Childhood Research Quarterly*, 17, 318–337. doi:10.1016/ s0885-2006(02)00167-9
- Stanovich, K. E., & Cunningham, A. E. (1993). Where does knowledge come from? Specific associations between print exposure and information acquisition. *Journal of Educational Psychology*, 85, 211–229. doi:10.1037/0022-0663. 85.2.211
- Tseng, W.-T., & Schmitt, N. (2008). Toward a model of motivated vocabulary learning: A structural equation modeling approach. *Language Learning*, 58, 357–400. doi:10.1111/j.1467-9922.2008.00444.x
- Turner, L. A., & Johnson, B. (2003). A model of mastery motivation for at-risk preschoolers. Journal of Educational Psychology, 95, 495–505. doi:10.1037/0022-0663.95.3.495
- U.S. Department of Health and Human Services. (2002). A descriptive study of Head Start children and families: FACES Technical Report I. Washington, DC: Author.
- Vitiello, V. E., Greenfield, D. B., Munis, P., & George, J. L. (2011). Cognitive flexibility, approaches to learning, and academic school readiness in Head Start preschool children. *Early Education & Development*, 22, 388–410. doi:10.1080/10409289.2011.538366
- Whitehurst, G. J., & Lonigan, C. J. (1998). Child development and emergent literacy. *Child Development*, 69, 848–872. doi:10.2307/1132208
- Yuet-Han Lau, J., & McBride-Chang, C. (2005). Home literacy and Chinese reading in Hong Kong children. Early Education & Development, 16, 5–22. doi:10.1207/s15566935eed1601\_1
- Zill, N., Kim, K., Sorongon, A., Shapiro, G., & Herbison, R. (2008). Head Start Family and Child Experiences Survey 2003: Data user's guide. Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research and Evaluation.
- Zill, N., Sorongon, A., Kim, K., Clark, C., & Woolverton, M. (2006). FACES 2003 research brief: Children's outcomes and program quality in Head Start. Washington, DC: U.S. Department of Health and Human Services.

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