The Role of Environment in the Development of Reading Skills: A Longitudinal Study of Preschool and School-Age Measures

Victoria J. Molfese, Arlene Modglin, and Dennis L. Molfese

Abstract

The purpose of this study was to extend previous studies on the influence of environmental measures on intelligence scores by examining how proximal and distal measures of children's environments in the preschool period and in the primary-grade period are related to their performance on reading achievement tests. Reading performance was explored using two approaches. The first approach involved the identification of children within a longitudinal sample who had poor reading skills at 8 years of age. The second approach used the full range of reading scores to explore whether factors influencing poor reading were different from those influencing good reading. Participants were 113 children, including 35 children with poor reading skills, who were part of a longitudinal study of cognitive development. Socioeconomic status (SES), Home Observation for Measurement of the Environment (HOME) scores at 3 and 10 years of age, and school-administered and individually administered reading achievement scores were obtained. Both SES and HOME scores were found to be related to reading abilities, but preschool environment measures were more strongly and consistently related to and predictive of reading scores. Differences in the patterns of correlations and the results of the predictive models were found between the full sample and the poor readers. Variables other than proximal and distal measures of the environment are involved in the development of reading skills.

A child's environment is often cited as one source of influence in the development of intellectual skills. Strong correlations have been reported between various markers for home environment (socioeconomic status, maternal intelligence, characteristics of the home, and parenting practices) and performance on intelligence and other cognitive tests in childhood (e.g., R. Bradley, 1993; R. Bradley, Caldwell, & Rock, 1988; R. Bradley et al., 1989; Molfese, DiLalla, & Lovelace, 1995; Rubin & Balow, 1979; Schaimberg & Lee, 1991; Wallace, Escalona, McCarter-Daum, & Vaughan, 1982; Yeates, MacPhee, Campbell, & Ramey, 1983). It has also been shown that intelligence and cognitive development are differentially influenced by environmental variables. R. Bradley (1993), Gottfried and Gottfried (1984), and Scarr (1985) described the differential effects of environmental variables according to how directly they influence the child. Variables such as scores on the Home Observation for Measurement of the Environment (HOME) inventory (Caldwell & Bradley, 1984) are classified as proximal variables because they reflect conditions that are experienced directly by the child. Measures of socioeconomic status (SES), maternal IQ, and various demographic characteristics are classified as distal variables because they are experienced indirectly or from a distance. Both proximal and distal variables have been shown to influence cognitive development (Gottfried, 1984; Gottfried & Gottfried, 1984). Indeed, Molfese, DiLalla, and Bunce (1997) found that home environment measures were the single most important predictor of group differences in children’s intelligence at ages 3 through 8 years, with SES showing a smaller but still significant effect beginning at age 5 over and above the effects due to home environment. In a subsequent study based on the same longitudinal data, Espy, Molfese, and DiLalla (2001) used growth curve analysis to identify how home environment and SES influenced changes in intelligence scores between the ages of 3 and 6 years. Their findings confirmed earlier findings that both HOME and SES influence the intelligence scores of children. HOME scores were a stable predictor of intelligence test performance at age 3, but HOME scores did not predict changes in intelligence scores over time. SES influenced the rate of intellectual growth, specifically for nonverbal intellectual skills. The finding that environmental variables affect different aspects of intellectual growth in different ways is intriguing and raises questions as to what other
abilities influenced by intelligence are also influenced by environmental factors.

Among the cognitive abilities found to be influenced by intelligence are different reading skills. Not surprisingly, significant relations between the same types of family activities that influence intellectual abilities are related to children’s language, literacy, and reading abilities. For example, Dickinson and Tabors (1991) reported that home reading activities and language experiences of preschool children were related to their verbal skills and literacy-related knowledge (e.g., print knowledge, narrative skills). Children’s home experiences that expose them to print are related to early word reading skills (Baker, Fernandez-Fein, Scher, & Williams, 1998). Others have reported that measures of the home environment are related to reading achievement scores in children up to 11 years of age (R. Bradley, Caldwell, Rock, Hamrick, & Harris, 1988; Dubow & Ippolito, 1994), with higher scores on home environment measures related to higher achievement test scores.

The purpose of this study is to extend our previous studies on the influence of environmental variables on intelligence scores by examining how proximal and distal measures of children’s environments in the preschool period and in the primary-grade period are related to their performance on reading achievement tests. To gain a sense of the influence of environment over time, we explored how SES measures and measures of home environment obtained in the preschool and again in the early childhood period were linked to reading scores. The HOME inventory is a frequently used measure of children’s home environment, and different scales have been developed for the preschool (early childhood) period (EC HOME; ages 3 through 6 years) and the middle childhood period (MC HOME; ages 6 through 10 years). Extensive research has been published, particularly on the EC HOME scale, which has been used along with measures of SES and found to successfully predict a variety of cognitive abilities in childhood (e.g., Bradley et al., 1989). The effectiveness of the EC HOME in predicting reading skills has not yet been reported. In contrast, the MC HOME scale has been studied less than the EC HOME scale, but published reports have also found MC HOME scores to be related to cognitive scores and to achievement test performance (Dubow & Ippolito, 1994; Luster & Dubow, 1992). The purpose of this study is to see how environment scores measured by both the EC HOME and the MC HOME plus SES are related to performance on different reading assessments of children from 8 to 10 years of age. Previous research has found that EC HOME scores—including total scores and scores from individual subscales—can be strongly correlated with cognitive scores obtained 1 to 7 years after the age of EC HOME administration (Bee et al., 1982; R. Bradley & Caldwell, 1976; Gottfried & Gottfried, 1984; Taylor, 1998). This research investigates whether the MC HOME, administered closer in time to the assessment of reading skills, is a stronger correlate than the EC HOME. Moreover, whereas both the EC HOME and the MC HOME contain items related to a variety of different home-based child-centered activities, both scales also contain items that specifically relate to reading activities, such as the number of books in the home and encouragement to learn the alphabet, read words, and learn patterned speech. In addition to the usual scoring of the EC HOME and the MC HOME, reading subscale scores were created using HOME reading-related items to see if these were differentially related to reading scores compared to the total HOME scores.

We explored the reading performance of children using two approaches. The first approach involved the identification of children within our longitudinal sample who had poor reading skills. The use of a single group of poor readers—rather than further separating the poor readers according to discrepancies between IQ scores and reading achievement scores—keeps the focus solely on reading abilities (Siegel, 1989, 1992; Stanovich, 1991). Poor reading was defined based on Wide Range Achievement Test–Revised (WRAT-R; Jastak & Wilkinson, 1984) reading scores (<90) obtained at 8 years of age, an age when reading performance appears to become more stable than at earlier ages (Shaywitz, Escobar, Shaywitz, Fletcher, & Makuch, 1992). The second approach used the full range of reading scores. Fletcher, Foorman, Shaywitz, and Shaywitz (1999) have argued that factors influencing poor reading are no different from those influencing good reading. The success of this continuum approach is uncertain, because the identification of variables thought to influence reading development has been based largely on studies of poor readers. The present study seeks to understand the role of environmental variables in the reading performance scores of children in the primary grades. The study uses both school-administered reading achievement tests and reading achievement tests administered individually in the lab to provide a broader evaluation of reading performance.

### Method

#### Participants

The participants were children in a longitudinal study of cognitive development conducted in a stable, rural midwestern community. For this study, the scores of children tested longitudinally at ages 3 and 8 through 10 years were used. The children in the longitudinal study had been recruited at birth during a 5-year period (1984–1988) from families who were willing to participate and who expected to be available for yearly follow-up testing sessions. The children included in the study at birth either were typical, healthy, full-term infants or had some complications at birth that were not likely to result in permanent cognitive impairments (e.g., mild hyperbilirubinemia). Children with significant neonatal com-
plications (e.g., intraventricular hemorrhage, severe and persisting respiratory distress, neurological or metabolic complications likely to be chronic, genetic abnormalities) were excluded. The majority of children were from intact or reconstituted families who had Hollingshead two-factor (education and occupation) scores distributed across Categories II through IV. All children were White. Table 1 summarizes the characteristics of the children included in this study.

Children who had SES, HOME, and reading score data at the ages under study were included in the present study. Although most of the children participated in testing at each age, some children had missing scores. Several children (n = 43) had missing scores on the HOME administered at 10 years. Other missing data arose from differences in the achievement testing schedules across the schools attended by the children, so that some children did not have school-administered standardized reading achievement scores at both 9 and 10 years (n = 35) and some children did not have reading achievement scores at either age (n = 44). To compensate for this, an average score was created for children with standardized reading achievement scores available at both 9 and 10 years of age. For those children who had only one reading achievement score at either 9 years or 10 years, whichever score was available was used as the 9–10 reading achievement score. The correlation between 9-year scores and 10-year scores was .72 (p < .01), which speaks to the strong relatedness of these standardized scores. ANOVA was used to determine if children with school-administered reading achievement scores at 9 and 10 were different from children missing scores at those ages but who had scores at other ages, and to determine if children with HOME scores at 10 years were different from children with missing scores but who had HOME scores at 3 years. No significant differences were found.

A total of 113 children (56 boys, 57 girls) were included in this sample. The Wechsler Intelligence Scale for Children, 3rd edition (WISC-III; Wechsler, 1991), IQ scores of the full sample of children averaged 105.92 (range = 87–133, SD = 9.89), and the sample of poor readers (n = 35) averaged 104.00 (range = 87–127, SD = 9.86). No difference was noted in IQ between the total sample and the poor reader sample, t(146) = 0.19, ns.

**Measures**

*Environmental Measures.* Two measures of the child’s environment were used. Socioeconomic status (SES) measures were calculated for each participant using parental education, parental occupation (using the Hollingshead scheme of occupational categories; Bonjean, Hill, & McLemore, 1967), and family income. Education was scored on a 7-point scale (0 = some high school through 6 = education beyond college). Occupation was scored on a 7-point scale (0 = unskilled through 6 = higher executives of large concerns, proprietors, and major professionals). Income was scored on a 7-point scale (0 = less than $5,000 through 6 = more than $35,000). Although the top income level may seem low compared to urban samples, only 14% of participant families were in the highest group, with the remainder distributed among the lower income levels. The marker variables were averaged to provide a single SES score. If one of the five measures was missing, the others were averaged to form the overall SES score. Several researchers (Aylward, 1988; Matheny, 1989; Molfese, Holcomb, & Helwig, 1994) have found measures of SES to be strong predictors of performance scores.

**TABLE 1**

<table>
<thead>
<tr>
<th>Variable/Time</th>
<th>n</th>
<th>M</th>
<th>SD</th>
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<tr>
<td>HOME 3 years</td>
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<td></td>
<td></td>
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<tr>
<td>Total score</td>
<td>93</td>
<td>46.17</td>
<td>4.12</td>
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<tr>
<td>Reading and language</td>
<td>93</td>
<td>13.71</td>
<td>1.58</td>
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<tr>
<td>10 years</td>
<td>58</td>
<td>52.20</td>
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<tr>
<td>Total score</td>
<td>58</td>
<td>11.69</td>
<td>1.08</td>
</tr>
<tr>
<td>Reading and language</td>
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<td>4.91</td>
<td>1.15</td>
</tr>
<tr>
<td>SES 3 years</td>
<td>101</td>
<td>4.56</td>
<td>1.21</td>
</tr>
<tr>
<td>10 years</td>
<td>113</td>
<td>4.91</td>
<td>1.15</td>
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<td>SARAT 8 years</td>
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<td>68.60</td>
<td>23.77</td>
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<tr>
<td>9 years</td>
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<td>9–10 composite score</td>
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<td>70.51</td>
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<tr>
<td>WRAT-R/WRAT-3 Reading 8 years</td>
<td>113</td>
<td>98.14</td>
<td>14.69</td>
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<tr>
<td>9 years</td>
<td>98</td>
<td>103.31</td>
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<tr>
<td>10 years</td>
<td>96</td>
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<tr>
<td>10 years</td>
<td>96</td>
<td>102.58</td>
<td>13.11</td>
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</table>

Note. HOME = Home Observation for Measurement of the Environment (Caldwell & Bradley, 1984); SES = socioeconomic status (Bonjean, Hill, & McLemore, 1967); SARAT = school-administered reading achievement tests, such as the California Achievement Test (McGraw-Hill, 1985), Iowa Tests of Basic Skills (Riverside, 1993), Stanford Achievement Tests (Harcourt Brace Jovanovich, 1989), and others; WRAT-R = Wide Range Achievement Test–Revised (Jastak & Wilkinson, 1984); WRAT-3 = Wide Range Achievement Test, 3rd edition (Wilkinson, 1993); WRMT-R = Woodcock Reading Mastery Test–Revised (Woodcock, 1987).
whether used as a summary score (e.g., a Hollingshead score or a summing of individual index measures) or used in individual index measures (e.g., parental education, parental occupations, family income). Information on SES was requested of the parents yearly. SES information at 3 and 8 years of age was used in the analyses. If SES information was not provided by parents at those ages, the next closest younger age for which SES information was available was used. We found SES scores to be quite stable across time in this sample \((r = .91-.95;\) Molfese, Bunce, Carpenter, & Taylor, 1997).

The second environmental measure was the Home Observation for Measurement of the Environment (HOME) inventory. The HOME was administered when children were 3 years and 10 years of age and involved interview questions that were answered by a parent, usually the mother, and observation items. The HOME is administered in the home because some items require observations to be made in the home. The early childhood HOME (EC HOME) is used with families of children from 3 to 6 years of age and consists of 55 items (Caldwell & Bradley, 1984). The scale is composed of eight subscales: Learning Materials, Stimulation of Communicative Competence, Physical Environment, Warmth and Acceptance, Academic Stimulation, Modeling, Variety in Experience, and Acceptance of Child. The EC HOME total score and a subscale score composed of the 13 items most related to reading and language activities in the home were used in the analyses reported further on. Reading and Language composite item numbers were 4, 5, 7, 8, 10, 20, 23, 28, 29, 30, 31, 39, and 46.

**Reading Tests.** Reading achievement was measured both by tests administered at school and by individually administered tests.

- **School-administered reading achievement tests.** Reading achievement scores as measured by school-administered testing were used as one measure of reading ability. The schools attended by the children participating in this study administered a wide variety of different norm-referenced achievement tests. The most common achievement tests were the California Achievement Test (CAT; McGraw-Hill, 1985); the Iowa Tests of Basic Skills (ITBS; Hoover, Hieronymous, Frisbie, & Dunbar, 1996); and the Stanford Achievement Test Series (SAT; Berk & Haladyna, 1989). Only achievement tests that yielded national percentile rankings that included reading scores were used in the present study. For all reading tests, standard scores were used in the analyses reported further in this study.

- **Laboratory-administered reading tests.** The Reading subtest of the Wide Range Achievement Test–Revised (WRAT-R; Jastak & Wilkinson, 1984; 3rd edition, WRAT-3; Wilkinson, 1993) and the Word Attack subtest of the Woodcock Reading Mastery Test–Revised (Woodcock, 1987) were used. The Reading subtest of the WRAT-R was used with the 8-year-old participants, and the Reading subtest of the WRAT-3 was used for the 9- and 10-year-olds. Both WRAT subtests consist of words that step up in difficulty, and the child is required to read each word until he or she reaches a ceiling. The number of correctly pronounced words is then calculated for each child. Standard scores were used in the analyses reported in this study.

The Word Attack subtest of the WRMT-R was also used at all ages. The test is composed of 45 pseudowords and is designed to measure the child’s ability to pronounce words not recognizable by sight. Both nonsense words and words infrequently encountered are used. The number of correctly pronounced words is determined. Standard scores were used in the analyses reported in this study.

**Procedure**

The children were tested at yearly intervals. The data reported here are from tests administered at 3 years and 8 to 10 years of age. Laboratory tests, including the two reading tests, were administered to each child within 4 weeks of the child’s birth date. While the child was tested, parents completed questionnaires that included information concerning parental education, occupation, and income. The HOME inventory was administered during a visit to each child’s home that was scheduled within 1 week of the laboratory testing sessions at age 3 and at age 10. School achievement tests were administered according to the school’s schedule—fall, midyear, or spring—and standardized scores obtained at 8, 9, and 10 years were used. The children’s scores on the reading achievement tests were provided directly by the schools with the permission of the parents.

**Results**

Table 1 shows the means and standard deviations for the measures used for the independent and dependent variables in the analyses described here. Participant data were treated in two ways. First, analyses used the full sample data set with no grouping. Second, data were organized using a categori-
cal approach, in which children with poor reading skills were identified using their WRAT reading scores. Children with WRAT scores less than 90 were identified as poor readers. There were 35 children classified as poor readers out of the full group of 113 children.

Table 2 shows the results of correlations between environmental measures and reading measures for the full sample (FS). The SES measures at 3 and 10 years of age and the EC HOME total and Reading subscale scores were correlated with all reading achievement scores. The correlations between the MC HOME total score and its Reading subscale score and the reading achievement scores were weak, and there were few significant correlations. Indeed, only school-administered reading achievement scores at 9–10 years and MC HOME Reading scores were reliably correlated. Also shown in Table 2 are the correlations between the environmental measures and reading achievement scores for the poor readers (below-average readers; BAR). SES at 3 and 10 years and school-administered reading achievement scores at 8 years were reliably correlated, as were EC HOME total score and WRAT Reading scores at 8 and 10 and WRMT-R Word Attack scores at 8 and 10 years. Significant correlations were found between the MC HOME Reading subscale scores and school-administered reading achievement scores at 8 years. None of the other correlations was significant.

Multiple regression analyses tested the influence of HOME and SES scores in predicting the reading scores of the children. Analyses were done with the HOME total scores and SES and with the HOME Reading subscale scores and SES using 3-year scores and 10-year scores and with the reading achievement scores at 8 through 10 years of age. For the full sample, the measures of SES and HOME total and Reading subscale scores taken at age 3 were significant predictors of school-administered reading achievement scores at 8 and 9–10 years, of WRAT Reading scores at all ages, and of WRMT-R Word Attack scores at 8 and 10 years (adjusted $R^2$ ranged from .05 to .23; see Table 3). Only 3-year SES and the HOME Reading subscale scores were significantly predictive of WRMT-R Word Attack scores at 9 years (adjusted $R^2 = .08$). In contrast, SES scores at 10 years and MC HOME total scores measured at 10 years were only predictive of school-administered reading achievement scores at 8 years and WRAT Reading scores at 8 and 10 years (adjusted $R^2$ ranged from .07 to .28). SES and MC HOME Reading subscale scores were predictive of school-administered reading achievement scores at 8 and 9–10 years and WRAT Reading scores at 10 years. WRAT scores at 9 years and WRMT-R scores at all ages could not be predicted.

For the poor reading (BAR) sample, measures of SES and HOME total and Reading subscale scores at 3 and 10 years were significant predictors of school-administered reading achievement scores at 8 years (adjusted $R^2$ ranged from .24 to .55). SES and HOME total scores were significant predictors of WRAT Reading scores at 8 years and WRMT-R Word Attack scores at 10 years (adjusted $R^2$ ranged from .17 to .31).

**Discussion**

The present study examined the relation between proximal and distal measures of children's environments and children's performance scores on reading tests. Several results emerged. Just...
as has been found in a large number of studies of intelligence in children from preschool through early elementary school age, both SES and HOME scores were related to reading abilities. In this study, measures obtained from the HOME inventory at 3 and 10 years of age were used as proximal measures, and measures of SES at 3 and 8 years of age were used as distal measures. SES scores at both ages and scores on the early childhood version of the HOME scale were consistently correlated with reading scores at all ages and with all measures of reading, but correlations were not high. In contrast, the middle childhood HOME scores were weak or nonsignificant correlates of reading scores.

The finding that 3-year HOME scores are more effective than 10-year HOME scores as predictors of 8- to 10-year reading scores might be considered surprising, because it is generally assumed that contemporaneous measures are stronger correlates than are measures obtained at different time points, with the correlations becoming weaker as the time span broadens. However, other studies have also found EC HOME scores to be strong predictors of criterion measures obtained years later. Although such results have not previously been reported for reading scores as criterion measures, many reports have included correlations of HOME and SES with intelligence scores using measurements spanning periods of 3 months to 10 years. Correlations between measures obtained within a 12-month time span range from .09 to .57, those obtained within a 2-year time span range from .03 to .60, those obtained within a 3-year time span range from .10 to .57, and those obtained within a 4-year time span range from .08 to .67 (e.g., Bee et al., 1982; R. Bradley, 1993; R. Bradley & Caldwell, 1984; Gottfried & Gottfried, 1984; Yeates et al., 1983). Based on these results, EC HOME measures obtained at one point in time appear to maintain weak to moderate correlations with intelligence scores as criterion measures over intervals of up to 4 years. Thus, the performance on the EC HOME in correlation with reading scores found in the present study is consistent with previous findings, but it extends the time period over which significant correlations and predictive relations are found.

The difference between the effectiveness of the EC HOME and the MC HOME scores is not well established in the literature. One study by Taylor (1998) directly compared the effectiveness of EC HOME and MC HOME as predictors. In that study, 3-year EC HOME scores were found to be more strongly correlated with WISC-III scores obtained from 10-year-old children.
than were MC HOME scores obtained from same-age children. Unfortunately, few published studies have used the MC HOME or its subscales, although R. Bradley (1993) reported results showing low to moderate correlations between MC HOME total and subscale scores and math, reading, and total achievement scores measured contemporaneously (r = .12 to .41; R. Bradley, Caldwell, & Rock, 1988). Other published studies used short-form versions of the MC HOME that make it difficult to directly compare results (Dubow & Ippolito, 1994; Luster & Dubow, 1992). Differences in the effectiveness of the EC HOME and the MC HOME found by Taylor (1998) and in the present study may be more scale related than due to the lack of a relation between the 10-year home environment and intelligence or reading scores. The two HOME scales measure different aspects of the environment. Although common themes are reflected in some of the subscales on the EC HOME and the MC HOME, the MC HOME has a stronger focus on family involvement in activities outside of the home, paternal involvement, and emotional climate in the home. These differences between the EC HOME and the MC HOME are thought to reflect the activities and opportunities appropriate for children within the age range that each scale is designed to measure. The results of the present study can be interpreted as showing that the aspects of the home environment measured by the MC HOME are not directly related to the development of reading abilities, and this is true whether the MC HOME total scores are used or whether the subscale composed only of reading-related items is used. Given other findings that MC HOME scores were more weakly correlated with intelligence scores (R. Bradley, 1993; Taylor, 1998), the MC HOME may not be as useful a predictor of cognitive criterion measures as the EC HOME. It may also be that the scale developers’ intent of designing a scale to identify inadequate environments, rather than further separating adequate and enriched environments, may limit the scale’s usefulness with a sample that is not characterized by low environmental scores, such as the one used here.

The results of the predictive models using SES and HOME scores showed similarities to the results of the correlation analyses. Both preschool and early childhood measures of SES and HOME scores were predictive of the school-administered reading achievement scores at 8 and 9–10 years and the WRAT scores at 8 and 10 years. Predictive models for WRMT-R Word Attack were significant only when the preschool SES and HOME scores were included. The differential success of the environmental measures in predicting the reading scores at different ages is interesting, because the correlations of these measures with the reading scores across ages are strong (school-administered reading achievement, r = .62; WRAT, range = .79–.87; Word Attack, range = .80–.86). Yet there is apparently enough variation across instruments at different ages that uniformly significant models were not obtained. The amount of variance accounted for by the predictive models was larger than that accounted for by the simple correlations alone, which reflects the effects of combining the SES and HOME scores. These findings confirm that HOME and SES provide a means for predicting cognitive skills that is not provided by either measure alone. These findings are consistent with the conclusions of R. Bradley, Caldwell, and Elardo (1977) and Gottfried and Gottfried (1984) that both variables have differential effects on children’s cognitive development.

There were differences in the pattern of correlations and the results of the predictive models between the full sample and the poor readers (BAR group). For the poor readers, the strengths of the correlations between preschool and early childhood measures of environment and reading scores were more inconsistent than they were for the full sample. This inconsistency was also reflected in the results of the regression analyses, where few models that were predictive for the full sample were also predictive for the poor reading sample. A partial explanation for the difference in the results obtained lies with the difference in sample sizes (full sample = 113; poor reader sample = 35). However, there is a sufficient number of cases so that the cases:variables ratio in the analyses was not compromised. Overall, it is clear from the analyses that more than just environmental variables are involved in the development of reading skills for the full sample and for the poor readers. Indeed, much is known about the types of specific cognitive skills that distinguish successful readers from poor readers, including, for instance, short-term memory for words, digits, and other verbally coded material; phonemic awareness; rapid serial naming; executive functions; processing speed; auditory processing; experiences with rhyming and word game activities; and parent–child reading interactions that characterize some homes (L. Bradley & Bryant, 1983; Bryant & Bradley, 1987; Catts, 1989; Fowler, 1991; Gathercole, Willis, Emslie, & Baddeley, 1991; Llongan, Anthony, Bloomfield, Dyer, & Samwel, 1999; Sawyer, 1992; Scarborough, 1990; Scarborough & Dobrich, 1990; Share, Jorm, Maclean, Matthews, & Waterman, 1983; Silva, McGee, & Williams, 1983). That other measures need to be added to this list of predictors is clear.

In sum, the environment plays an important role in the development of reading abilities. Activities in the home, home characteristics, and parenting practices contribute to the development of children’s cognitive abilities—both intellectual abilities and reading abilities. Assessments seeking to characterize children’s cognitive development must include assessments of the family environment. Cognitive development is influenced by transactional relations between the child and different experiential factors in his or her environment. The child’s abilities and behaviors interact with and are affected by the people and experiences in the environment.
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