

Bringing It All Together: The Multiple Origins, Skills, and Environmental Supports of Early Literacy¹

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In the final three decades of the 20th century one of the exciting developments in the field of educational research was the emergence of theoretically grounded empirical research into the origins of literacy in the preschool years. This work has led to a growing relationship between two fields that previously had existed in relative isolation from each other: reading research and early childhood education. The result of this research has been the investigation of the emergence of literacy, and environmental factors that support its emergence, and a new awareness of the relevance of literacy for early childhood educators. A manifestation of the potential of these converging efforts was the release of a joint position statement on early literacy by the National Association of Educators of Young Children and the International Reading Association in 1998.

The investigation of early literacy has resulted in findings of considerable importance for social policy because it made evident that, even before children commence formal instruction in reading and writing, they display differences that mirror some of the divisions in our society, with children from less economically advantaged and non-English speaking homes being at a disadvantage (Zill, Collins, West, & Hausken, 1995). These early differences are remarkably stable as they have consistently been found in cross-sectional examinations of children aged 9, 13, and 17 on national assessments of literacy (Campbell, Hombo, & Mazzeo, 2000, p. 33). Longitudinal studies also provide evidence of considerable consistency within individual children from first grade to the later elemen-

tary grades (see Dickinson, Tabors, & Roach, 1996; Juel, 1988; Stanovich, 1986; Torgesen & Burgess, 1998; Whitehurst & Lonigan, 2001, for review). For example, Cunningham and Stanovich (1997) found that first-grade reading ability was a strong predictor of a variety of 11th-grade measures of reading ability, even when measures of cognitive ability were partialled out.

The study of early literacy has been pursued aggressively by many research teams. This work has addressed different questions and yielded considerable knowledge. Since the mid-1980s we also have been investigating the emergence of early literacy, paying special attention to the role of oral language. In this article we relate our work to some of the research being done by others and use findings from our studies to provide an integrated description of some of the major strands of research being done on early literacy. We begin by selectively reviewing the work of others and then discuss findings from studies we have conducted. Our discussion is organized around three questions: (1) What are the interrelationships among language and literacy skills at different points in development? (2) What environmental factors support children's acquisition of early literacy-related abilities? and (3) How can preschool teachers be helped to more effectively support children's early literacy development? As we review the work of others and our own work, we will note that it is widely agreed that literacy emerges from a variety of abilities. Further, we will argue that the varied abilities that are recruited for literacy tasks develop in systems that are mutually facilitating and that, over time, these systems become increasingly closely intertwined. We suggest that this perspective on development has implications for interventions because, if literacy-related skills emerge as interrelated systems, then optimal interventions will be those that bolster all relevant abilities rather than focusing only on a single skill area.

In the following pages we first articulate our theoretical assumptions and then briefly review work of others

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that bears on our three guiding questions. We then address these same questions as we discuss selective results from our studies.

OUR THEORETICAL ASSUMPTIONS

Researchers who study literacy development from cognitive and psycholinguistic orientations now generally agree that early literacy draws upon multiple interrelated developmental areas including oral language, phonological awareness, knowledge of the graphic features of print (e.g., letter shapes, organization on the page), understanding of how sounds map onto print, and a sense of the varied uses of print (Snow, Burns, & Griffin, 1998; Whitehurst & Lonigan, 1998). We share this perspective, but have been particularly interested in tracing the role of language in literacy development (Dickinson, 1987; Dickinson & McCabe, 1991; Snow & Dickinson, 1991). Thus, in this article we will trace the place of oral language in literacy development, noting what we have learned about its evolving relationship to other literacy-related skills.

A second assumption of our work has been that both the home and the classroom are vital to children's literacy development. Researchers and educators need to attend to both settings if we are to understand and effectively support the reading success of children. Our attention to the impact of settings has been shaped by the Vygotskian tradition, which posits that intrapsychological functioning has its origins in the social world, in interpsychological activities (Vygotsky, 1962, 1978). Our interest in discourse is consistent with the Neo-Vygotskian tradition, which has placed discourse at the center of the study of development (Wertsch, 1991). For example, Lave and Wenger (1991) state, "learning, thinking, and knowing are relations among people in activity in, with, and arising from the socially and culturally structured world" (p. 51). Accordingly, we have paid attention to *activity settings*, which are recurrent patternings of people, purposes and motives, scripts governing conduct, task demands, and salient cultural values that influence interaction in that setting (Gallimore & Goldenberg, 1993). Consistent with this approach, our data have been collected in home and classroom activity settings (e.g., book reading, meal time), and such data have been coded and analyzed by context.

A core concern of our work has been to understand better and begin to address the previously noted disparities in rates of literacy success across different groups. The sociocultural tradition has provided us a theoretical lens for examining this problem. Researchers in this tradition have suggested that the failure of many children from African-American homes and lower socioeconomic groups results from a mismatch between home and community patterns of language use and the uses of language typically expected in school (Dickinson, 1987; Edelsky, 1991; Heath, 1983; Gee,

1992; Michaels, 1985; Snow, 1983). These differences in language experience could have varied negative effects. One possibility is that they provide children recurrent indications that their ways of making meaning are not valued (Michaels, 1991), resulting in their rejection of school culture (Rose, 1989). They also might make it hard for children to understand the ways they are being asked to use language (Heath, 1983). One possible outgrowth of children's lack of familiarity with classroom uses of language may be that children adopt nonstandard ways of answering questions that teachers then have trouble interpreting. As a result, teachers may find it hard to respond to children in ways that help them to learn (Vernon-Feagans, 1996; Vernon-Feagans, Hammer, Miccio, & Manlove, 2001).

The mismatch between home and school uses of language may result in children acquiring limited facility with selected language skills. We have hypothesized that the kind of language use that is particularly important for long-term literacy includes the following features: extended, connected discourse that communicates meaning using varied, precise vocabulary and syntax rather than gesture or reliance on extensive shared knowledge. Children with relatively little exposure to such conversations may lack the range of vocabulary they need for advanced literacy and may lack facility dealing with the type of extended discourse they are expected to use for advanced reading and writing tasks (Dickinson, 1987; Snow & Dickinson, 1991). Thus, in our investigation of the environmental supports for children's acquisition of literacy-related language skills we have sought to describe multiple settings in children's classrooms and homes in terms of their provision for such uses of language.

We now turn to a selective review of the work of others that addresses the three questions of this paper.

PRIOR RESEARCH

Question 1: What Are the Interrelationships Among Language and Literacy Skills at Different Points in Development?

To understand the patterns of relationship among language and literacy skills at different points in time and longitudinally, we first must identify the relevant abilities. It is now widely accepted that emergent literacy consists of varied skills, knowledge, and attitudes that are developmental precursors to conventional forms of reading and writing (Sulzby & Teale, 1991; Whitehurst & Lonigan, 1998). Multiple strands of language and literacy acquisition must be woven together in order for children to successfully negotiate the acquisition of full literacy and each of the major strands of language and literacy is itself comprised of substrands (Dickinson & McCabe, 1991). While there is general agreement about the relevant strands, what is less well understood are the

patterns of interrelationship among these strands across time.

Because of space constraints, we provide merely a brief review of work on oral language. Here we simply acknowledge that in the early years, children acquire basic concepts of print (Clay, 1979) that contribute to children's early reading skills (Tunmer, Herriman, & Nesdale, 1988). Early knowledge of the alphabet and alphabetic principle are key to later reading (Adams, 2001), and children's emerging spelling reflects children's growing grasp of the conventions of printed language and understanding of the relationships between sounds and letters (Bear, Invernizzi, Templeton, & Johnston, 1996; Bissex, 1980, Henderson, 1981). Study of the emergence of spelling has made clear the complex interplay between children's awareness of spoken language and spelling (Read, 1971; reviewed by Richgels, 2001). As children's skills develop, the mutual facilitation between the systems that support literacy continue to evolve as children's skills in writing and reading begin to facilitate each other (Lomax & McGee, 1987). In fact, tests of various models of the reading-writing relationship (Shanahan & Lomax, 1988) find that models that incorporate the use of reading knowledge in writing, as well as the reverse, account for real literacy performances better than either a reading-to-writing or a writing-to-reading unidirectional approach. Thus, the connections between reading and writing are complex and both depend on oral language when children first are exposed to literacy in the preschool years. As children's literacy skills mature, the component skills recruited for literacy tasks may become increasingly well organized and more closely intertwined.

Oral Language and Literacy

Oral language is comprised of multiple strands and there is considerable variability in the amount of attention given to different strands by those interested in literacy development. We touch on each of the major components of language and indicate major points that have been made about the contributions of each to literacy.

Phonology. Children are capable of perceiving speech sounds at birth (Eimas, Siqueland, Jusczyk, & Vignito, 1971), and in the first four years of life largely master the production of those sounds relevant to their native language (Ingram, 1986). While phonological skills are precursors to literacy, there is evidence that literacy has an impact on phonology, as the way that words are spelled comes to shape pronunciation of some words as children become literate (Ehri, 1984).

A veritable flood of research documents the importance of a later development, phonological awareness, which is the ability to reflect upon and manipulate the sound structure of spoken language. Specifically, phonological awareness is now established as important to children's ability to focus on graphemes and link them to phonemes (Bryant, MacLean, Bradley, &

Crossland, 1990; Bryant, MacLean, & Bradley, 1990; Byrne & Fielding-Barnsley, 1991; Maclean, Bryant, & Bradley, 1987; Siegel, 1998; Speece, Roth, Cooper, & de la Paz, 1999; Stanovich, 1992; Tunmer, Herriman, & Nesdale, 1988; Wagner & Torgesen, 1987; Wagner, Torgesen, Laughon, Simmons, & Rashotte, 1993; Vellutino & Scanlon, 2001). Important as phonological awareness is for early reading, there also is evidence of reciprocal influence between awareness of sound and literacy, with children's experiences with print serving to bolster their awareness of the sound structure of words (Ehri & Wilce, 1980; Wagner, Torgesen, & Rashotte, 1994).

Vocabulary. Vocabulary has long been known to be predictive of later reading comprehension (Anderson & Freebody, 1983; Stahl & Fairbanks, 1986). Scarborough (2001) recently conducted a meta-analysis of the relationship between receptive vocabulary and reading development and found that 20 cases found a significant correlation (Median $r = 0.40$). In addition, five studies found an association between expressive vocabulary and later reading scores (Median $r = 0.49$). The reasons for this relationship between vocabulary and literacy are multifaceted, possibly reflecting differences in children's world knowledge, in language experience and associated linguistic skills, and in ready access to lexical items while reading. The difficulty in determining the exact relationships between vocabulary and reading is made more difficult by the fact that the size of children's vocabularies is related to their home language experiences (Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991), with language experience and children's resulting vocabularies and later reading success varying by social class (Hart & Risley, 1995). Thus, in addition to its direct contributions to reading, vocabulary could be a sensitive index of broader educational support provided by families.

There is evidence of reciprocal relationships between vocabulary and literacy. Among young children, evidence is beginning to indicate that the size of a child's vocabulary may play a role in bolstering phonological awareness (Goswami, 2001; Metsala, 1999). Among older children who have begun learning to read, vocabulary growth occurs as children read more; thus vocabulary growth itself is in part a byproduct of reading (Nagy, Herman, & Anderson, 1985).

Syntax. Researchers interested in literacy who have examined syntax have found that variability in syntactic skills is related to reading ability (see Dickinson, 1987, for review). Scarborough (1990, 1991) has found considerable discrepancies between the complexity of sentences produced by preschoolers who became disabled readers and those who did not, with these discrepancies being more sizable than those for pronunciation accuracy or expressive vocabulary. Moreover, a number of studies find correlations between receptive syntactic abilities and later reading scores (Median $r = 0.40$) (Scarborough, 2001). As for the other dimensions of language, there is some indication that children's acquisition of syntax may be affected by their experiences

with literacy, with book reading providing important sources of input (Chomsky, 1972).

Discourse. Two types of extended discourse have received attention in relationship to literacy—explanations and narratives—with the latter receiving far and away the most attention.

Narratives and explanations are forms of oral discourse that often convey novel information to audiences who are physically removed from the things or events described; therefore the words must communicate meaning with minimal dependence on contextual cues and shared a priori assumptions. Children's frequency of exposure to explanatory talk during meal times has been linked to literacy-related outcomes (Beals, 2001). Also, a number of studies have documented the predictive relationship between narrative and academic competence (Bishop & Edmundson, 1987; Feagans & Appelbaum, 1986; Fazio, Naremore, & Connell, 1996; Menyuk, Chesnick, Liebergott, Korngold, D'Agostino, & Belanger, 1991).

At the discourse level of language there again is evidence of the early impact of literacy experiences on children. Scollon and Scollon (1981) reported evidence suggesting the impact of literacy experiences on their two-year-old child's discourse. Study of the language children use when pretending to read carries multiple subtle indications of children's awareness and growing control of language patterns found in books (Pappas & Brown, 1987; Purcell-Gates, 1988; Sulzby, 1986).

The interrelationships between narrative, literacy, and home experiences are complex for narrative because narrative is such a powerful means by which cultures convey meaning. There are considerable cultural differences in narrative forms, and whether or not a child's home discourse matches the discourse valued at school depends to a large extent on the type of reading materials that are found at school (McCabe, 1996). In usual classroom practice, however, there are differences in the extent to which the production of different types of narratives are valued. The work of Feagans and her colleagues (see Vernon-Feagans, Hammer, Miccio, & Manlove, 2001, for review) finds that superior narrative skills in poor African-American children are *negatively* related to literacy (measured in various ways), while the narrative skills of Caucasian children in the same classrooms were *positively* related to achievement and school literacy. This unsettling finding highlights the fact that patterns of interdependency between language and literacy pass through the filter of culture; assumptions that might flow from a skills model in which practice of skills in one area directly transfer to other areas must take into account the cultural significance that children, parents, and teachers assign to different approaches to using language.

In sum, it is widely agreed that multiple abilities are recruited for literacy tasks, including multiple aspects of oral language. Converging evidence also suggests that relationships among these abilities are bidirectional from an early point in children's acquisition of literacy.

Question 2: What Environmental Factors Support Children's Acquisition of Early Skills?

Home

Several key factors have been identified that support children's acquisition of the abilities highlighted above. *Book reading* between adults and children and related literacy activities such as taking trips to the library are a key support at home (Bus, van Ijzendoorn, & Pelligrini, 1995; Scarborough & Dobrich, 1994; Wells, 1985). A second key support is the provision of an *intellectually engaging environment*, which includes outings to museums, parks, and libraries (Snow, Barnes, Chandler, Goodman, & Hemphill, 1991). Parental modeling of various literacy activities also has an impact upon children (Taylor, 1983). Another, often overlooked, key support is the kind of social interaction—conversation—children need to be engaged in from birth. The amount of time that adults spend talking directly with children is related to IQ between birth and three years (White, 1978), and is related to academic achievement between the ages of three and five years (Wells, 1981). Hart and Risley (1995) provide ample documentation that, on average, children from low socioeconomic status (SES) homes receive fewer encouragements to talk and less overall exposure to vocabulary, thereby missing out on two kinds of experiences that benefit vocabulary development (Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991). In many ways, then, many children from low SES backgrounds are not inducted into the kind of discourse that enables a smooth transition to literacy (Heath, 1983).

Preschool

Just as homes provide opportunities to nourish language and literacy development, so too do preschools. Simply providing low-income preschool-aged children with some form of classroom-based educational service can have a beneficial impact on most domains assessed, most frequently in the language and academic/literacy domains at least until first grade, according to a recent meta-analysis of state-funded preschool impacts that looked for impact through the fifth grade (Gilliam & Zigler, 2001). Similarly, a meta-analysis by Barnett (2001) of the impact of model preschool programs on children found significant long-term effects on reading beyond third grade in 5 of the 11 programs examined and he argues that these results likely underestimate the beneficial effects of these programs on children's ultimate success.

Even in the "model" programs that Barnett reviewed, such as Head Start and Title I, program quality varies enormously, and studies of the impact of variation in quality has documented that high-quality classroom

support can pay off in children's acquisition of language and literacy skills. McCartney (1984) found that the verbal interaction of preschool children with caregivers in a daycare environment was critical; children from centers with extensive caregiver speech performed better on tests of language development than children from centers where peers dominated the conversation. Similarly, Bryant, Burchinal, Lau, and Sparling (1994) examined relationships between classroom quality and child outcomes and found that children in higher-quality Head Start classrooms performed better on measures of achievement and pre-academic skills, regardless of the quality of their home environment.

In sum, examinations of home interactions have found specific practices that support language and literacy development. Studies of preschool classrooms have found that provision of preschool experiences—especially those of high quality—have beneficial effects on children's language and literacy skills. However, prior work in preschools has provided relatively little information about the impact of specific classroom practices on children's language and literacy development. More insight into the impact of specific practices comes from interventions designed specifically to enhance children's language and literacy development.

Question 3: How Can Preschool Teachers be Helped to More Effectively Support Children's Early Literacy Development?

Given the stability and predictiveness of individual differences in language and emergent literacy skills for reading success, and the impact of program quality on children, it is crucial that preschool and kindergarten programs be as strong as possible. The need for high-quality programs is especially pressing in cases where children's families are not able to provide children optimal support for their acquisition of the language and literacy skills needed for long-term academic success.

Considerable research now points to the fact that specific kinds of changes in preschool classrooms can have beneficial effects on children. For example, Whitehurst developed a program of dialogic reading that he implemented with preschool teachers and found that a six-week small-group center-based reading intervention produced substantial positive changes in the development of children's language that endured at least six months after the intervention (see Whitehurst & Lonigan, 1998, for review of these studies). While the dialogic reading intervention had effects through the end of kindergarten, the effects had faded by the end of second grade (Whitehurst, Epstein, Angell, Payne, Crone, & Fischel, 1994). Hargrave and Sénéchal (2000) implemented a modification of Whitehurst's dialogic reading program at school and also found it to have short-term effects on preschool children's expressive and receptive vocabulary.

Other book-based interventions in preschools serving low-income children have been found to have beneficial effects on children. In a year-long observational study in a Head Start classroom, Dickinson (1989) found evidence that increased use of books, most of which were enlarged books with predictable text, improved children's engagement in book reading and interest in print. Similarly, Brown, Cromer, and Weinberg (1986) implemented a program of repetitive personal and shared book readings that enhanced literacy awareness, improved preparation for first grade, and broadened children's literacy interests, but those authors themselves conclude that there is a need to look at the long-term effectiveness of their method.

A different type of book-based intervention is the book flood approach. In this program, more than 330 child care centers were enriched with approximately five books per child and provided 10 hours of training to staff with the result being gains on several measures of early literacy skills that were still in evidence six months later (Neuman, 1999). Other programs that introduced literacy-related objects and settings also produced increased literacy-related play and activity (Neuman & Roskos, 1992, 1997).

An alternative approach to intervention during the preschool years was used by Lundberg, Frost, and Petersen (1988), who implemented a program consisting of metalinguistic games and exercises and found small but significant effects on rhyming tasks and tasks involving word, syllable, and phoneme manipulation. This preschool training in phonological awareness had a facilitating effect on subsequent reading and spelling acquisition that persisted until second grade, the end of reported data collection.

In contrast to the other efforts, which have targeted specific skills or implemented selected strategies, the Language Enrichment Activities Program (LEAP) has implemented changes that affect the entire curriculum, with specific attention to the use of books, as well as attention to print. Promising results suggesting the presence of gains in vocabulary and school readiness have been reported informally at conferences (Margaret H. Cone Preschool, 1996; Peters, 2001), but to our knowledge no reports have appeared in print.

While the ultimate goal of interventions is to enhance children's growth, it is important that we understand whether teachers are able to incorporate recommended strategies into their practice, to know if they begin to generate novel strategies consistent with the general approach being recommended, and how long teachers and programs sustain the new practices. One discouraging report that speaks to these issues comes from a study of dialogic reading in which, six months after the intervention had ended, teachers were interviewed about their classrooms and no teacher reported continuing the small-group reading structure (Arnold & Whitehurst, 1994).

In sum, interventions can be examined along three dimensions: (1) the target of intervention (e.g.,

book-specific activity and related skills), (2) the duration of impact on children and classrooms, and (3) the degree of teacher control over the intervention. Regarding the target of intervention, a number of successful interventions have used books or implemented more or different ways of reading of books, but we know much less about efforts to change curriculum or provide more general language enrichment. Second, while short-term effects have been reported, relatively little is known about the *long-term* duration of intervention impact on children and virtually nothing is known about longer-term impact on classrooms. Finally, we know virtually nothing about the extent to which teachers are able to generate novel strategies that are consistent with the approach provided by outside authorities.

STUDIES TO BE REVIEWED

The data we will discuss come from three studies the first author has been involved with since the late 1980s that have been designed to examine factors supporting the language and literacy development of children from low-income families (see Table 1). The study that provided the foundation for my work is the *Home-School Study of Language and Literacy Development* (HSLLD), a longitudinal study of 85 children from low-income families (Dickinson & Tabors, 2001). When children from low-income homes were three years old we began collecting data describing their home and classroom language and literacy experiences. Toward the end of their kindergarten year we began assessing their language and literacy development and continued to do so into middle school. We examined children's abilities using a battery of child assessments in kindergarten that included a measure of receptive vocabulary (PPVT-R, Dunn & Dunn, 1981) and a battery we called the SHELL-K (Snow, Tabors, Nicholson, & Kurland, 1995). It assessed print-related skills using the Comprehensive Assessment Profile (Mason & Stewart, 1989), which included assessments of print concepts, phonemic awareness, letter knowledge, and early writing. We also used assessments of productive language (story telling, a word definition task). The SHELL-K included a story comprehension measure that consisted of a series of questions asked about *The Snowy Day* (Keats, 1962) while it was being read. In subsequent years the measures changed to include standardized assessments of decoding (Wide Range Achievement Test, Jastak & Wilkinson, 1984) and reading comprehension, the California Achievement Test (CTB Macmillan/McGraw-Hill, 1992). Information about kindergarten children's literacy and phonemic awareness comes from the SHELL-K battery (Snow, Tabors, Nicholson, & Kurland, 1995).

The HSLLD study provides intensive data on a relatively small sample. More recent studies provide data from many more classrooms by reducing the intensity of examination of environments and the duration of study.

The New England Quality Research Center (NEQRC)² carried out correlational research examining the effect of home and early care environments on Head Start children. Over a two-year period we collected data from (1) parents, (2) about the quality of the classrooms ($n = 72$), and (3) on children's fall-to-spring growth in language and literacy. Our sample consisted of three- and four-year-old children from English and Spanish speaking homes ($n = 393$).

While we can learn much from correlational studies, additional insight about the impact of experience on development comes from introducing changes in children's experiences and seeing their effects. To this end we have recently been conducting research in which we attempt to change the language and literacy environments in preschool classrooms by supporting the professional growth of the teachers. Our intervention involves engaging teachers and their supervisors in an intensive course on language and literacy that seeks to deepen teachers' pedagogical content knowledge (Shulman, 1987) by guiding them in examinations of their practice through the theoretical lens supplied by literacy research and by helping them adopt new and more effective instructional strategies. We are evaluating the impact of this course, Literacy Environment Enrichment Program (LEEP), using a comparison group design and the same classroom quality tools and child assessment tools employed by the NEQRC. To date we have completed analysis of fall and spring data collected from two waves of participants (1998–1999; 1999–2000). We now have fall and spring data about classroom quality from 30 classrooms that received the LEEP intervention as compared with 38 classrooms that did not. We also have fall and spring direct assessment data for 152 children, and for 593 children who were rated by teacher. Roughly half of all the children for whom we have data were in classrooms that received LEEP.

Research Tools for NEQRC and LEEP Studies

As is shown in Table 2, we have used a number of measures to assess children's various skills. Across these studies we have information on receptive vocabulary skills for preschool-aged children (PPVT-III, Dunn & Dunn, 1997) and kindergarten children (PPVT-R, Dunn & Dunn, 1981). Data on early literacy and phonological sensitivity come from the Profile of Early Literacy Development (PELD) (Dickinson & Chaney, 1997), which includes an assessment of print-based knowledge and of phonological sensitivity. The Emergent Literacy Profile (ELP) assesses environmental print knowledge, awareness of

² The NEQRC included researchers from the Education Development Center, Inc., Harvard Graduate School of Education, Boston College, and the Massachusetts Society for the Prevention of Cruelty to Children.

TABLE 1
Projects Discussed

	<i>Sample</i>	<i>Characteristics</i>	<i>Child Measures</i>
Home-School Study (HSLLD)	83 children 72 classrooms	100% low SES aged 3–13 years 49% m, 51% f Head Start	PPVT-R SHELL-K: Comprehensive Assessment Profile Bear story Definitions task <i>Snowy Day</i> story understanding WRAT CAT reading comprehension
Quality Research Centers Consortium, Three-Site Study: University of Georgia, University of North Carolina, New England (including EDC, Harvard University, Boston College, Massachusetts Society for the Prevention of Cruelty to Children)	761 children 128 classrooms 639 parents	100% low SES 51% m, 49% f Ave. age = 4.8 yrs. 64% African-Amer. 28% white 4% Hispanic or Native Amer. 4% other, mixed, or not available Head Start	PELD EPAP ELP PPVT-III <i>Goodnight Moon</i> story understanding and print concepts M-Kids Parent interview
New England Quality Research Center (NEQRC) Year 1	276 children 42 classrooms	100% low SES 57% m, 43% f Ave. age = 4.7 59% white 15% African-Amer. 7% Hispanic 3% Asian 19% other	PELD: EPAP ELP PPVT-III <i>Goodnight Moon</i> story understanding and print concepts Parent interview
Year 2	129 children 29 classrooms	100% low SES 47% 3 yrs. 53% 4 yrs. 52% m, 48% f 44% Spanish 56% English	
Literacy Environment Enrichment Program (LEEP)	152 children 68 teachers	2–5 years 41.5% m, 58.5% f 48% white 19% African-Amer. 26% Hispanic/Native Amer. 6% Other 100% female 73% white 9% African-Amer. 11% Hispanic/Native Amer. 7% Other 25% certified (CDA) 36% associate 7% BA	PELD: EPAP ELP PPVT-III <i>Goodnight Moon</i> story understanding and print concepts

TABLE 2
Tools Used

<i>Tools</i>	<i>Authors</i>	<i>Assessment Purpose</i>	<i>Psychometrics</i>	<i>Age Appropriateness</i>
Measures developed for these studies				
Profile of Early Literacy Development	Dickinson & Chaney, 1997	Environmental print Awareness of written language	Cronbach's alpha = 0.86, n = 578	3–5 yrs.
• Early Literacy Profile (ELP)		Letter recognition		
• Early Phonological Awareness Profile (EPAP)		Early writing Phonological awareness	Cronbach's alpha = 0.93, n = 984	3–5 yrs.
M-Kids	Nurss, 1995	Print concepts Story retelling Pre-writing skills	Kuder-Richardson reliabilities from 0.89–0.92; validity correlation with Metropolitan Readiness Test composite = 0.62	4–6 yrs.
Print Concepts	FACES, 2000	Understanding <i>Good Night Moon</i> Print and book concepts		3–5 yrs.
SHELL-K Battery	Snow, Tabors, Nicholson, & Kurland, 1995	CAP (Early literacy) Narrative production Word definition (decontextualized language) Story comprehension	Not relevant	Kindergarten
Early Language and Literacy Classroom Observation (ELLCO)	Smith, Dickinson, Sangeorge, Anastasopoulos, in press	Dimensions of classrooms that support literacy acquisition	Chronbach's alpha = 0.91, n = 157; good test-retest reliability; training produces interrater reliabilities of 90%+	Preschool through third grade
Standard measures used				
Peabody Picture Vocabulary Test				
PPVT-R	Dunn & Dunn, 1981	Receptive vocabulary	Nationally normed	
PPVT-III	Dunn & Dunn, 1997			
Wide Range Achievement Test—Revised				
WRAT-R	Jastak & Wilkinson, 1984	Decoding	Nationally normed	Level 1: 5.0–11.11 yrs. Level 2: 12.0–74.11 yrs.
California Achievement Test				
CAT Reading Comprehension section	CTB Macmillan/McGraw Hill	Reading comprehension	Nationally normed	K–12 (0.0–12.9+ yrs.)

written language, letter recognition, and early writing ($\alpha = 0.86$, $n = 578$). The Early Phonological³ Awareness Profile (EPAP) includes phoneme deletion and rhyming tasks (Cronbach's $\alpha = 0.93$, $n = 984$). Additional data on children's literacy come from a Print Concepts test used by FACES (2000), a large longitudinal study of Head Start. The Print Concepts test is divided into two parts, questions that assess children's understanding of *Goodnight Moon* (Brown, 1947) and questions about print and book concepts (e.g., cover, page, picture vs. print).

Question 1: What Preschool Abilities Contribute to Children's Long-Term Literacy Success?

Using our multiple studies and data sources we now examine the pattern of interdependencies among the previously discussed dimensions of children's early literacy at four points in time, the preschool years, kindergarten, fourth grade, and seventh grade, and trace the relationships within and across measures from kindergarten through seventh grade.

Interrelationships Among Skills

Prior studies of literacy development have paid scant attention to the intercorrelations among varied literacy-related abilities over time. Indeed, in reflecting on her recent efforts to carry out meta-analyses, Scarborough (personal communication, April 21, 2001) commented that although she found numerous reports of longitudinal relationships, she rarely found reports of intercorrelations among variables at the same point in time. Changes in these patterns of associations could be of theoretical importance. Indeed, based on prior research indicating the bidirectional nature of literacy-related skills in the early years, we hypothesized that the interrelationships seen in the early years would become stronger as the varied linguistic and print-related capacities become integrated into an increasingly well-organized cognitive-linguistic system. While our preschool data set is drawn from a different sample than our kindergarten through seventh grade set, examination of our results over time allows us to begin to examine the interrelationships among literacy-related skills at different time points.

Data from the preschool years collected by the NEQRC (Table 3) reveal that receptive vocabulary is consistently and modestly related to phonological sensitivity ($r = 0.31$ to 0.34), to early literacy (ELP: $r = 0.32$ to 0.52), and to print concepts ($r = 0.28$ to 0.38). Vocabulary was similarly more closely linked to the comprehension items from the book-reading task

($r = 0.30$ to 0.46) than to the items assessing print and book concepts ($r = 0.28$ to 0.38). Phonological awareness was somewhat correlated with literacy ($r = 0.20$ to 0.21), but, surprisingly, more strongly related to print concepts ($r = 0.44$ to 0.48), and book comprehension ($r = 0.45$ to 0.39). Thus, among three- and four-year-old children we see a consistent pattern of modestly significant associations across measures of receptive vocabulary, phonological awareness, print knowledge, book and print concepts, and story understanding.

Data from older children come from the HSSLD for 75 children from the end of kindergarten through seventh grade. Data from when the children were in kindergarten again revealed interrelationships among these variables (Snow, Tabors, Nicholoso, & Kurland, 1995). Our measure of early literacy, the CAP (Comprehensive Assessment Profile, Mason & Stewart, 1989) combined scores for print concepts, phonemic awareness, early writing, and print knowledge because all three were very strongly associated ($r > 0.85$). This combined early literacy score was rather strongly related to several language measures (receptive vocabulary, $r = 0.61$; story comprehension, $r = 0.54$; word definitions, $r = 0.49$). We also found moderately strong interrelationships among our language measures. Children's skill in defining words was related to other language measures (vocabulary, $r = 0.53$; story comprehension, $r = 0.45$, narrative production $r = 0.41$) and with early literacy ($r = 0.49$). Narrative production also was correlated with vocabulary ($r = 0.46$) and somewhat less strongly with early literacy ($r = 0.33$). Thus, our preschool and kindergarten data suggest that language and print-related skills are significantly intertwined.

When children in the HSSLD study were in fourth and seventh grades the patterns of association among measures of decoding, reading comprehension, and receptive vocabulary continued to be strong. In fourth grade (sample that ranged from 48 to 54), correlations between decoding, reading comprehension, and receptive vocabulary ranged from $r = 0.60$ to $r = 0.69$. At the seventh-grade level, with a sample of 51, the correlations were even stronger ($r = 0.75$ to 0.76).

To determine whether the apparent changes in the interrelationships among variables changed over time we tested the significance of the difference in magnitude of correlations, focusing on the relationship between receptive vocabulary (PPVT) and print-focused literacy (in preschool, the ELP; at kindergarten, the CAP; at fourth and seventh grades, WRAT decoding). We employed a one-tailed test for difference between independent correlations (Bruning & Kintz, 1977) and found a significant difference between preschool and kindergarten. The correlation between vocabulary and print-focused literacy in kindergarten [$r(68) = 0.58$] was significantly higher than the correlation in preschool [$r(468) = 0.32$], $z = 2.49$, $p < 0.01$, one-tailed. Using a test for difference between dependent correlations, we found that the correlation between receptive vocabulary and print-focused literacy

³ Previously called the Early Phonemic Awareness Profile.

TABLE 3
Correlations[†] between PPVT and Other Measures of Language and Literacy Development—QRC and LEEP Data (n = 461–520)

	PPVT (Raw Score)		PPVT (Standard Score)		ELP (Total)		EPAP (Total)		Book Concepts (Total)		Book Concepts (BK & Print Score)		Book Concepts (Comprehension Score)	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
	n = 495	n = 463	n = 505	n = 505	n = 520	n = 468	n = 504	n = 461	n = 243	n = 258	n = 243	n = 258	n = 243	n = 258
PPVT—Raw Score			0.91	0.91	0.52	0.38	0.34	0.34	0.50	0.43	0.38	0.36	0.46	0.37
PPVT—Standard Score					0.40	0.32	0.31	0.33	0.43	0.35	0.31	0.28	0.41	0.30
Emergent Literacy														
Profile (ELP)—Total							0.20	0.21	0.41	0.51	0.38	0.48	0.34	0.40
Early Phonemic														
Awareness (EPAP)—Total									0.53	0.49	0.48	0.44	0.45	0.39
Book Concepts—Total											0.81	0.78	0.91	0.89
Book Concepts—Book & Print Score													0.49	0.41
Book Concepts— Comprehension Score														

[†]All correlations reported in this table are statistically significant at the $p < 0.001$.

in seventh grade [$r(51) = 0.75$] was significantly higher than the correlation in kindergarten [$r(68) = 0.58$], $t(df = 48) = 1.952$, $p < 0.05$, one-tailed. This latter change is due more to a increase in the strength of the interrelationship between fourth [$r(49) = 0.65$] and seventh [$r(51) = 0.75$] grades, $t(df = 46) = 2.00$, $p < 0.025$, than to a change between kindergarten [$r(68) = 0.58$] and fourth [$r(49) = 0.65$] grades, which was not significant. The fact that the larger change came between fourth and seventh grade is especially noteworthy because the same instrument was used those times whereas different tools were used at the two earliest time points. This finding suggests that the changes in correlational patterns may not simply be an artifact of changes in research tools.

Thus, data from the NEQRC suggest that in the preschool years there is a set of skills that are important to later literacy that are beginning to be related to each other. HSSLD data indicate that the associations between vocabulary, which may be an indicator for associated discourse and syntactic skills, and those skills that undergird decoding (e.g., phonemic awareness, letter identification, sound-symbol correspondence knowledge) may be stronger in kindergarten than during the preschool years.⁴ Further, the association between the language skills tapped by the PPVT in our analyses, decoding, and reading comprehension may gain strength as systems of literacy-related skills become organized into an increasingly efficient and well-organized system.

⁴ While the NEQRC and HSSLD studies measures similar constructs, the actual assessments used were different. As a result we cannot be certain of the extent to which the strong interrelationships in kindergarten reflect stronger associations as opposed to varying results yielded by different assessment measures.

Relationships Over Time

Also of considerable interest is the stability of individual differences over time, or, in other words, relationships between early and later language and literacy skills. Data from the HSSLD allow us to speak to this question. We have conducted growth curve analyses that link our data from kindergarten and first grade to fourth grade (Dickinson, Tabors, & Roach, 1996). These analyses enable us to determine the extent to which children's later reading comprehension is related to two different factors: their initial level of abilities in different areas and the rate of growth they experienced subsequently (i.e., the slope of the line describing the change in scores between first grade and fourth grade). Regression analysis of growth trajectory data to predict end-of-fourth grade reading comprehension revealed significant contributions from children's first-grade decoding skill ($p < 0.001$) and vocabulary skills ($p < 0.01$), as well as for the rate of growth in decoding between first and fourth grade ($p < 0.05$). Our model that included all these variables accounted for 76 percent of the variance ($p < 0.001$) in reading comprehension scores. These results suggest that children's vocabulary and decoding skills in first grade strongly predict end-of-fourth-grade reading. Similar growth curve analyses have not been completed for later years, but first order correlational data suggest that we will continue to find a strong contribution of early status to later achievement levels. As shown in Table 4, the relationships between kindergarten achievement levels and seventh grade were as strong or stronger than those observed three years earlier.

In sum, data from multiple studies now confirm the interrelationships among language and print-based skills as children begin formal literacy instruction and the HSSLD data suggest that these early

TABLE 4
Correlations Between Kindergarten Outcomes and Fourth and Seventh Grade Outcomes (n = 51–55)

	<i>4th Grade Reading Comprehension</i>	<i>7th Grade Reading Comprehension</i>	<i>4th Grade Receptive Vocabulary</i>	<i>7th Grade Receptive Vocabulary</i>
Kindergarten Receptive Vocabulary	0.60***	0.71***	0.76***	0.63***
Kindergarten Emergent Literacy	0.62***	0.63***	0.58***	0.61***
Kindergarten Academic Language	0.55***	0.51***	0.64***	0.61***
Kindergarten Narrative Production	0.47***	0.45***	0.28*	0.31*

* $p < 0.05$.

*** $p < 0.001$.

interrelationships not only endure, but become stronger with time. Further, our data suggest that early levels of achievement are strongly linked to later success. Based on these two patterns we propose that there is a system of language and literacy capacities—present in the preschool years—that becomes increasingly well organized as children begin reading and writing. These abilities act in a synergistic manner so that later achievement levels reflect the combined impact of this language/literacy system.

Question 2: What Environmental Factors Support Children's Acquisition of These Early Abilities?

HSSLD Results

The purpose of the HSSLD was to study home and classroom factors that support the long-term literacy success of children from low-income homes. Data from the preschool years have been most fully analyzed and provide considerable insight into the impact of interactions in the home and classroom on children's language and literacy development at the end of kindergarten. Analyses of our longitudinal data suggest that it is important for us to understand the forces shaping these early starting points because children's early achievement levels are strongly related to their later academic success. Analyses of children's home and classroom experiences have now been refined to the point where we could identify a small set of variables to describe the theoretically significant features of children's early experiences.

In children's homes we found that kindergarten vocabulary and early literacy are strongly reflective of the use of varied vocabulary during meal times (Tabors, Beals, & Weizman, 2001), as well as when playing with toys, reading books, and telling stories. Strong patterns of book use at home also have an impact on kindergarten language and emergent literacy (DeTemple, 2001; Tabors, Roach, & Snow, 2001).

Similarly, in children's preschool classrooms we found evidence that kindergarten language and literacy are predicted by the use of varied vocabulary by teachers and classmates (Cote, 2001; Dickinson, 2001c), by teachers engaging children in intellectually challenging conversations (Dickinson, 2001a, 2001b, 2001c), by teachers' conversations during book reading (Dickinson & Smith, 1994; Dickinson, 2001a), and by teachers providing a rich curriculum (Dickinson, 2001b, 2001c). When we combined home and classroom interactional variables in regression analyses, we found that homes and classrooms contribute significantly to predicting kindergarten vocabulary and literacy, after we controlled for home demographics. For both vocabulary and early literacy, our models account for more than 56 percent of the variance in kindergarten scores (Tabors, Snow, & Dickinson, 2001). Growth trajectory analyses relating these same home and classroom factors to children's reading comprehension at the end of fourth grade found that fourth-grade decoding was partly predicted by demographic factors (21 percent of the variance), but that home and classroom predictors raised this to 43 percent of the variance (Roach & Snow, 2000). These analyses indicated that early experiences strongly predicted children's initial starting point, but had relatively less ability to predict the rate of growth between kindergarten and fourth grade. These findings make clear that children need to get off to a good start and to have strong schooling if they are to make continued growth.

In sum, results of the HSSLD mean that the well-known impact of socioeconomic status on children's acquisition of literacy needs to be qualified; socioeconomic status per se is less important to predicting children's attainment of literacy than are their specific home and classroom experiences.

Correlational Studies

While the HSSLD study provided a strong case for the importance of home and classroom factors to

children's language and literacy development during the preschool years, it was based on a relatively small sample. Our more recent studies draw upon much larger samples, thereby providing an opportunity to consider the generalizability of the HSSLD data. The NEQRC study sought to understand the impact of families and early childhood classrooms on children's language and literacy development. A set of analyses from three of the Quality Research Centers (Dickinson, McCabe, Anastasopoulos, Abbott-Shim, Lambert, & Peisner-Feinberg, under review), drew data from over 600 children from two regions of the country. Regression analyses of data from parent interviews revealed that, after controlling for demographic factors such as income, parental education, and family size, home factors (e.g., book reading) had significant effects on children's receptive vocabulary, early literacy, and phonological awareness. While these data are not the direct observational data employed by the HSSLD, they nonetheless extend and support the HSSLD finding of the impact of education-oriented interactions in the home on children's early literacy development.

The NEQRC also sought to determine the impact of classroom experiences on children's early language and literacy development. With our sample of 71 classrooms we used hierarchical linear modeling to determine the contribution of classroom quality to children's receptive vocabulary (PPVT-III, Dunn & Dunn, 1997) and early literacy scores (as assessed by the Emergent Literacy Profile). First we took into account differences between children associated with their backgrounds, such as home language (English- or Spanish-speaking), gender, and age, leaving variance in scores that was not accounted for by the background factors. This between-classroom variance was 15 percent for vocabulary and 20 percent for literacy. We then used our measures of classroom quality to determine how much of the variance accounted for by classroom experiences could be attributed to our measures of the quality of classroom support for language and literacy. The primary tool we employed to assess classroom quality was the Early Language and Literacy Classroom Observation (ELLCO) (Smith, Dickinson, Sangeorge, & Anastasopoulos, in press). This rating tool was constructed to capture those dimensions of classrooms found by the HSSLD study to be important sources of support to young children's literacy development. ELLCO scores accounted for 80 percent of the between-classroom variance in vocabulary and 67 percent of the between-classroom variance in early literacy (Dickinson, Sayer, Sprague, Miller, Clark, & Wolf, 2000).

Thus, analyses from our larger correlational studies support the results of the HSSLD in providing additional evidence that the quality of preschool classrooms attended by children from low-income families can play an important role in supporting their vocabulary growth and early literacy development.

Question 3: How Can Preschool Teachers be Helped to More Effectively Support Children's Early Literacy Development?

We now have strong evidence that the preschool years are a time when language and literacy-related abilities are emerging, and some indication that this may be a point when different dimensions of children's language, cognitive, and emergent literacy abilities are starting to coalesce into a system of interrelated abilities. Further, we have evidence that homes and classrooms make independent and important contributions to children's long-term literacy development. Indeed, many reading problems can be avoided if we provide strong classroom instruction (Snow, Burns, & Griffin, 1998; Vellutino & Scanlon, 2001). Thus we are faced with the obvious challenge: Can we improve classroom environments sufficiently to have a long-lasting positive impact on children's literacy development? It is the challenge of providing high-quality classroom instruction that we now address.

In our approach to improving classroom quality we initially drew on the findings of the HSSLD showing the importance of teacher-child interactions throughout the day. We hypothesized that teachers need to adopt effective ways of interacting with children and engaging them in productive uses of print all day long. We reasoned that for this to occur, teachers must have a conceptual understanding of literacy and a repertoire of strategies for supporting children's development. This is a tall order for teachers who are at the bottom of the pay scale, many of whom have little college-level training that deals with curriculum, language, and literacy. To meet this need we developed an intensive, four-credit course for classroom teachers and their supervisors. This approach, now called the Literacy Environment Enrichment Program (LEEP), requires that teams of teachers and their supervisors take the course together. Teachers, supported by their supervisors, learn about literacy and language development, reflect on their classrooms using their emerging knowledge, and develop and implement new and more effective methods of literacy instruction. In particular, LEEP focuses on using books more effectively, supporting writing, fostering language development, and helping parents support their child's literacy development. In addition, supervisors learn more effective supervisory practices and employ them as they support the efforts of their collaborating teacher. This course is now being delivered as a four-credit course that is given through two three-day institutes. Work now is underway⁵ to develop the program so that it can be delivered using two-way interactive television, thereby expanding its audience.

⁵ Supported by the Interagency Research Initiative, REC-9979948.

We now have data from two years during which LEEP was delivered in the intensive institute format; additional data are currently being collected. Using the same tools employed by the NEQRC, we have found a significant and beneficial effect of LEEP on classroom environments, on teachers' approach to curriculum, and specific support for language and literacy (Dickinson & Sprague, 2001; Dickinson, Miller, & Anastasopoulos, 2000). Even though our sample of teachers is still small (LEEP $n = 30$; comparison group $n = 38$), our measures of impact on classroom quality are showing strong effects. We assessed LEEP and comparison classrooms in the fall and spring and compared change scores. Positive changes on aspects of classrooms specifically connected to language and literacy (e.g., presence and use of books, writing, home support for literacy) showed strong improvements among LEEP teachers while there was no change between fall and spring scores among comparison group teachers, resulting in highly significant between-group differences ($t(67) = 5.60$, $p < 0.0001$). Similarly strong effects were seen on a checklist that assessed provision of literacy areas and tools in the classrooms ($t(65) = 5.00$, $p = 0.0001$).

Of course, our primary goal is to make a difference for children. To determine whether this intervention has the desired impact on children we compared fall-to-spring change scores for receptive vocabulary and found evidence of some advantage for children in the classrooms of teachers who were taking LEEP during the year of our evaluations ($t(151) = 2.00$, $p < 0.05$) (Dickinson, Miller, & Anastasopoulos, 2001). We currently are collecting longer-term follow-up data from children who remained in Head Start with teachers who took part in LEEP. A qualitative study examining the long-term impact of the intervention on teachers and supervisors indicates that there are enduring effects on the curriculum teacher's plan and the nature of the teacher-supervisor relationship (Dickinson, Kloosterman, Miller, & Anastasopoulos, 2000). The magnitude and duration of impacts on children remain to be seen.

In sum, our data demonstrate that an intervention that seeks to effect changes in classroom environments by deepening teachers understanding of language and literacy and fostering more effective collaboration between teachers and supervisors can have a dramatic positive impact on classrooms and these improvements appear to translate into better language and literacy growth among children. Furthermore, our long-term qualitative analysis using case study methodology to examine the enduring effects of LEEP indicate that this professional development approach results in changes that programs can sustain for at least two years after the end of the intervention ((Dickinson, Kloosterman, Miller, & Anastasopoulos, 2000). We are continuing to collect qualitative data as well as quantitative data on classrooms and children for the year following the one during which teachers participated in LEEP.

CONCLUSION

The past 20 years have brought awareness that full understanding of children's literacy development must include the preschool years. Data are accumulating that suggest remarkable stability in key aspects of children's language and literacy (Snow, Tabors, & Dickinson, 2001; Scarborough, 2001; Whitehurst & Lonigan, 2001). We need to better understand the dynamics that give rise to this stability. One part of the explanation for this stability may be that children develop interrelated cognitive and linguistic systems that strengthen as they become increasingly better organized over time. Difficulties establishing this system at an early point might partially account for later problems. An additional explanation for the long-term stability in children's literacy may be that, by and large, there are few major changes in the overall quality of classroom support for language and literacy and no significant changes in the level of support parents are able to supply.

If our account of the emergence of literacy is correct in its emphasis on the importance of interacting systems of related skills, we need to consider how interventions can be devised that effectively address a broad range of children's language and more print-specific skills. Our approach with preschool teachers has been to help them deepen their understanding of literacy and, with the support of their supervisors, draw upon this knowledge as they employ recommended practices and create new ones that are designed to foster all aspects of children's early literacy development. It is our assumption that practices that emerge from teachers' conceptual understanding and are encouraged by local supervisors are more likely to be sustained and generalized than discrete strategies adopted in response to the demands of a particular intervention that is in place for a limited period of time.

In the coming years we need to better understand the sources of long-term stability in children's ability levels and determine if there are times when intervention is most likely to result in enduring changes. We also need to learn much more about how effective interventions can be introduced into programs and sustained once they are in place and to examine the relative merits of targeting skill-specific or strategy-specific interventions in contrast to more broad-based approaches. By bringing together our knowledge of the many tributary strands that comprise literacy, and by developing a model of this broad picture, we hope to more effectively enable children from all backgrounds to bring together all of what they need to become successful speakers, readers, and writers.

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Bringing it all together: The multiple origins, skills, and environmental supports of early literacy. 2001. Allyssa McCabe. OUR THEORETICAL ASSUMPTIONS Researchers who study literacy development from cognitive and psycholinguistic orientations now generally agree that early literacy draws upon multiple interrelated developmental areas including oral language, phonological awareness, knowledge of the graphic features of print (e.g., letter shapes, organization on the page), understanding of how sounds map onto print, and a sense of the varied uses of print (Snow. Multiple strands of language and literacy acquisition must be woven together in order Bringing It All Together: The Multiple Origins, Skills, and Environmental Supports of Early Literacy. *Learning Disabilities Research and Practice*, 16, 186-202. Duke, N. K., Pearson, P. D., Strachan, S. L., & Billman, A. K. (2011). A longitudinal study of early reading difficulties and subsequent problem behaviors. *Scandinavian journal of psychology*, 52 3, 242-50 . Keenan, J, Betjemann, R & Olson, R (2008) Reading Comprehension Tests Vary in the Skills They Assess: Differential Dependence on Decoding and Oral Comprehension, *Scientific Studies of Reading*, 12:3, 281-300, Kendeou P. (2015). A general inference skill. (2001) Bringing it all together: The multiple origins, skills and environmental supports of early literacy. *Learning Disabilities Research and Practice*, 16(4), 186-202. Dickinson, D. K., McCabe, A., Anastasopoulos, L., Peisner-Feinberg, E., & Poe, M. D. (2003) The comprehensive language approach to early literacy: The interrelationships among vocabulary, phonological sensitivity, and print knowledge among preschool-aged children. *Journal of Educational Psychology*, 95(3), 465-481. Dickinson, D. K., & Porche, M. V. In S. B. Neuman, & D. K. Dickinson (Eds.), *Handbook of early literacy research* (pp.97-110). New York, NY: Guilford Press. Snow, C. E. Bringing it all together: the multiple origins, skills, and environmental supports of early literacy. *Learning Disabilities Research & Practice* 16(4), 186-202. CrossRef Google Scholar. Dieterich, S. E., Assel, M. A., Swank, P., Smith, K. E. & Landry, S. H. (2006). The impact of early maternal verbal scaffolding and child language abilities on later decoding and reading comprehension skills. *Journal of School Psychology* 43(6), 481-494. CrossRef Google Scholar. Driessen, G., Smit, F. & Slegers, P. (2005).

Bringing it all together: the multiple origins, skills, and environmental supports of early literacy. *Learning Disabilities Research & Practice* 16(4), 186-202. CrossRef Google Scholar. Dieterich, S. E., Assel, M. A., Swank, P., Smith, K. E. & Landry, S. H. (2006). The impact of early maternal verbal scaffolding and child language abilities on later decoding and reading comprehension skills. *Journal of School Psychology* 43(6), 481-494. CrossRef Google Scholar. Driessen, G., Smit, F. & Slegers, P. (2005). Literacy, 21st century skills, ICT and a common pedagogical framework - these four seem to be flavours of the month in many schools, including mine. What is not evident, however, is how schools blend all of these disparate strategies together into one framework. A Phase four is the point in learning where teachers invite students to apply their knowledge and skills in new situations that are authentic and involve real-world problem solving. It is in this phase that students have the first real opportunity to choose an application for their new skills that are of personal interest to themselves, with guidance or advice from their teacher. Early literacy plays a key role in enabling the kind of early learning experiences that research shows are linked with academic achievement, reduced grade retention, higher graduation rates and enhanced productivity in adult life. This report synthesizes the body of professional knowledge about early literacy and offers research-based recommendations. What we know: Literacy development starts early in life and is highly correlated with school achievement. A Concerns about trends in early literacy assessment include the use of assessments that focus on a limited range of skills and the nature of the assessments in use. Both factors may cause teachers to narrow their curriculum and teaching practices, especially when the stakes are high. Bringing It All Together: The Multiple Origins, Skills, and Environmental Supports of Early Literacy. *Learning Disabilities Research and Practice*, 16, 186-202. <https://doi.org/10.1111/0938-8982.00019>. has been cited by the following article A ABSTRACT: The study examined the influence of community based early childhood education on children's literacy and cognitive skills. The study sought to investigate whether children who attended the community based early childhood programmes were ahead of their peer who did not attend any programmes. The method used was quantitative in nature. The total sample was approximately two hundred and thirty-one. These were divided into treatment and control groups.