

Framework for Developing Evidence-Based Early Literacy Learning Practices

Carl J. Dunst
Carol M. Trivette
Tracy Masiello
Nicole Roper
Anya Robyak

ABSTRACT

A research-to-practice framework is described for organizing available research evidence and using this evidence to develop literacy learning practice guides and tool kits. The framework includes a model of early communication, language, and literacy development; operational definitions of seven overlapping areas of literacy skills; a description of the person and environment factors influencing literacy learning; and an organizing scheme for developing evidence-based literacy learning practices. The framework is being used at the Center for Early Literacy Learning for culling research evidence to identify the characteristics of early literacy learning experiences associated with later literacy success.

This *CELLpaper* includes a description of a framework for synthesizing research evidence on early literacy learning and using this information for developing evidence-based early literacy learning practices. The framework is being used at the Center for Early Literacy Learning (CELL) to develop practice guides and tool kits that early childhood intervention practitioners, parents, and other caregivers can use with young children, birth-to-six years of age, with identified disabilities or developmental delays and with those at risk for poor outcomes to promote preliteracy, emergent literacy, and early literacy learning and development. The major aims of CELL are to: (1) synthesize available research evidence on effective early literacy learning interventions, (2) identify and develop evidence-based practices from this research, (3) implement and evaluate the use of these evidence-based practices, and (4) conduct both general and specialized technical assistance promoting the adoption and sustained use of evidence-based early literacy learning practices. CELL is an early childhood technical assistance center funded by the U.S. Department of Education, Office of Special Education Programs (OSEP), and is part of OSEP's ongoing in-

vestment in scaling up the use of evidence-based practices (DeStefano, Dailey, Berman, & McInerney, 2001).

This paper includes four sections. The first section includes a model for describing the early communication, language, and literacy development of young children birth-to-five years of age. The second section includes a description of the areas of early literacy learning that constitute the focus of CELL research syntheses and practice guide development. The third section includes a description of the person and environment factors that contribute to early literacy learning and development. The fourth section includes a research-to-practice characterization scheme for

CELLpapers is a publication of the Center for Early Literacy Learning (CELL) funded by the U.S. Department of Education, Office of Special Education Programs (Grant #H326B060010). CELL is a collaboration among the Orelena Hawks Puckett Institute, the American Institutes for Research, PACER Center, and the A.J. Papanikou Center for Developmental Disabilities at the University of Connecticut Health Center.

developing evidence-based literacy learning practice guides and tool kits. The content of the paper constitutes a systematic approach to culling research evidence and making sense of the evidence for informing early childhood intervention practices.

The framework described in this paper is based on lessons learned from conducting practice-based research syntheses of early childhood research studies to identify the characteristics of practices and environmental experiences that are associated with positive effects or benefits (Dunst, Trivette, & Cutspec, 2002). A practice-based research synthesis involves the analysis and integration of small bodies of evidence where researchers have investigated the manner in which the same or similar intervention variables are related to the same or similar outcomes. The characteristics associated with positive effects and outcomes in turn are used to develop practice guides that *mirror* the research findings (Dunst, in press). Practices that mirror research evidence are centrally important for bridging the research-to-practice gap. This is accomplished by identifying what mattered most in terms of the practice characteristics that are associated with child outcomes, and using this information as the foundation for practice-guide development.

EARLY COMMUNICATION, LANGUAGE AND LITERACY DEVELOPMENT

Table 1 shows a model for describing the early communication, language, and literacy development of infants, toddlers, and preschoolers birth-to-five years of age. The model is based on one developed by a NICHD Early Childhood Education and School Readiness Work Group (2002). The work group was charged with identifying “current research on what children should learn and develop from birth through age five to prepare (them) for kindergarten and the early grades” (p. 1). The Work Group highlighted those behavioral and developmental accomplishments that research indicates are important for successful school-age cognitive and academic performance.

The CELL version of the model divides the early communication, language, and literacy development of young children into five overlapping age ranges and three phases of literacy development (preliteracy, emergent literacy, and early literacy). Each phase includes the development of literacy-related skills and accomplishments that research indicates are the competencies that are the foundation for later literacy success. Preliteracy development is defined as those nonverbal communication and social skills acquired before language onset that are the foundations for both language acquisition and emergent literacy skills (Lonigan, 2006; van Kleeck, 1998). Emergent literacy development is defined as the verbal and nonverbal skills that are the foundation for the process of learning to read, write, and develop other literacy-related abilities (Chaney, 1994; Mc-

Table 1
A Developmental Model for Describing Early Literacy-Related Skills and Accomplishments

Months	Developmental Levels	Phases of Development
0-15	Prelanguage and Early Nonverbal Communication	Preliteracy
12-30	Language Onset and Vocabulary Development	
24-42	Language Growth and Emergent Literacy Development	Emergent Literacy
36-48	Early Literacy Development and Metalinguage Awareness	
48-60	Literacy Skill (Reading, Writing, etc.) Development	Early Literacy

Naughton, 1995). Early literacy development is defined as acquisition and mastery of the fundamentals of reading, writing, and other literacy-related skills (Hall, Larson, & Marsh, 2003; Neuman & Roskos, 1997).

Preliteracy Development

The period of development from birth to approximately 12–15 months of age includes a child’s acquisition of a number of important communication and literacy-related skills, including, but not limited to, joint attention, nonverbal (gestural) communication, vocalizations (cooing and babbling), speech and language perception, and phoneme speech stem acquisition. Schickedanz (1999), in her book *Much More than the ABCs*, describes looking and recognizing, picture recognition and comprehension, book handling and play, and child behavior during story reading as some of the preliteracy behavior that infants master on their way to becoming literate. The kinds of activities that are the contexts for preliteracy development include, but are not limited to, parent/child lap games, singing to infants, word play, and touching and talking (Armbruster, Lehr, & Osborn, 2003b; Parlakian, 2003).

The focus of CELL preliteracy research syntheses will be practices that facilitate the development of nonverbal (gestural) communication skills (Bates, Camaioni, & Volterra, 1975; Bullowa, 1979; Holdgrafer & Dunst, 1986; Holdgrafer & Dunst, 1991; Trevarthan, 1979), parent/child and teacher/child joint attention and reciprocity (Liszkowski, Carpenter, Henning, Striano, & Tomasello,

2004; Papousek, 1995; Slaughter & McConnell, 2003), and the literacy-rich experiences and opportunities (Dunst & Shue, 2005; Goin, Nordquist, & Twardosz, 2004; Lawhon & Cobb, 2002) that support and strengthen infants' acquisition of behavior associated with later literacy competencies. The particular practices and interventions that will be examined are ones that literacy experts have identified as the important building blocks for literacy success (e.g., Fitts, 2005; National Early Literacy Panel, 2006).

Emergent Literacy Development

The toddler period of development from 12–15 to approximately 30 months of age includes the acquisition of a variety of emergent literacy development skills and accomplishments including, but not limited to, the acquisition of first words, the production of conventional speech acts (requesting, attention getting, describing, etc.), vocabulary development, language use, language comprehension, symbol and print recognition, and the development and emergent understanding of the association between print and the meaning of text essential for subsequent reading, writing, and other literacy-related skills (Whitehurst & Lonigan, 2001). The focus of CELL emergent literacy research syntheses will be the experiences and opportunities (Cairney, 2003; Goin et al., 2004; Hemmeter, McCollum, & Hsieh, 2005), instructional practices (Wolery & Sainato, 1996), and caregiver interactional styles (Havlik, 2003; Trivette, 2003) that provide the contexts for learning the precursors of reading, writing, and other literacy-related skills.

Early Literacy Development

The period of development from about 30 months to 5 years of age includes the mastery of many of the fundamentals and precursors of conventional literacy skills and accomplishments (Ferreiro & Teberosky, 1982; Fitts, 2005; Shanahan, 2005). This includes, but is not limited to, understanding word units and phonemes, metalanguage capabilities (analyzing language, “playing” with language, etc.), invented spelling, echo reading, and letter and word recognition. The focus of CELL early literacy research syntheses will be both the formal and informal learning opportunities, instructional practices, and specialized interventions that research indicates are associated with later literacy success (e.g., Dickinson & Neuman, 2006; Hall et al., 2003; Neuman & Dickinson, 2002). The kinds of literacy learning practices that will be examined are ones that are the foundations for the development of the literacy skills described next.

KEY AREAS OF EARLY LITERACY DEVELOPMENT

A review and synthesis of the early literacy learning and development literature indicates that there are seven overlapping, interrelated areas of literacy-related competencies: Alphabet knowledge, print awareness, written lan-

guage, reading comprehension, phonological awareness, oral language, and listening comprehension. The majority of these skill areas were identified by Early Reading First (2002), the National Early Literacy Panel (2006; Fitts, 2005; Shanahan, 2005), and other noted experts (see e.g., Connor & Tiedemann, 2005; Morrow, 2001) as the preliteracy, emergent literacy, and early literacy skills that are important for later literacy success.

One of the major sources of information on the early literacy development of infants, toddlers, and preschoolers is the National Early Literacy Panel (2006; Fitts, 2005; Shanahan, 2005). A secondary analysis of the panel's data and findings suggests that the seven literacy areas can be organized into two interrelated domains of literacy-related skills (print related competencies and linguistic processing competencies) based on the intercorrelations among the literacy skills related to later literacy success and the practices that are associated with literacy-skill acquisition. Adams (1990; van Kleeck, 1998) proposed a similar model that differentiates between print (orthographic) and speech (phonological) processing skills. The print related domains include alphabet knowledge, print awareness, written language, and text comprehension. The linguistic processing domains include phonological awareness, oral language, and listening comprehension. This organizing scheme is being used to both review and synthesize the early literacy learning research literature and develop practice guides and tool kits for promoting young children's acquisition of literacy-related competencies.

Table 2 includes brief descriptions of the skills and capabilities constituting the content of each literacy area. These “working definitions” as well as the information presented next constitute the literacy skills that are the focus of CELL review and synthesis.

Alphabet Knowledge

Alphabet knowledge refers to the child's ability to recognize and name the letters of the alphabet (Whitehurst & Lonigan, 2001). Knowledge of the graphic symbols of the alphabet and recognition of the fact that letters have sounds and letter names is recognized as crucial to subsequent reading (Nodelman, 2001; Treiman & Kessler, 2003; Wasik, 2001).

Print Awareness

Print awareness refers to a child's recognition of the characteristics and rules of the written language (Strickland & Schickedanz, 2004) and the child's ability to understand that words in print have corresponding speech and language features and that directionality is an important feature of printed text (e.g. reading left to right, and top to bottom). Print awareness is important because “children who know about print understand that the words they see in print and the words they speak and hear are related” (Armbruster, Lehr, & Osborn, 2003a, p. 7).

Table 2
Seven Areas of Literacy Learning and Development

Domain	Definition
Alphabet Knowledge	Ability to recognize and name the letters of the alphabet. This includes the "translation of units of print (graphemes) to units of sound (phonemes). . . . at the most basic level this task requires the ability to distinguish letters" (Whitehurst & Lonigan, 2001, p. 16).
Print Awareness	Ability to recognize the characteristics of the rules and properties of written language (Justice & Ezell, 2001).
Written Language	Ability to represent ideas or words in a printed or written format. This includes learning to differentiate the elements of the written system (e.g., letters and words).
Text Comprehension	Ability to understand and process the meaning of ideas represented in text. Reading and text comprehension is the process of simultaneously extracting and constructing meaning through interaction and involvement with written language consisting of three elements: text, reader, and activity/purpose for reading.
Phonological Awareness	Ability to recognize, manipulate, and use sounds in words, including the ability to hear and discriminate the sounds in language. This includes the "general ability to attend to the sounds of language as distinct from its meaning. . . . noticing similarities between words in their sounds, enjoying rhymes, counting syllables, and so forth are indications of such 'metaphonological' skill" (Snow et al., 1998, p. 52).
Oral Language	Ability to use words to communicate ideas and thoughts and to use language as a tool to communicate to others. Oral language "consists of the use of words and rules for organizing words and changing them and the abilities to listen and accurately reconstruct what is said on the basis of understanding" (Roskos et al., 2004, pp. 6-7).
Listening Comprehension	Ability to process and understand the meaning of spoken words. Listening comprehension entails the decoding of words and sentences and the meaning of what is spoken and heard.

Written Language

Written language refers to a child's ability to represent ideas and words in print (Dyson, 2002). According to Whitehurst and Lonigan (2001), "behaviors such as pretending to write and learning to write one's name are examples of emergent writing. . . . indicating that [the child] knows print has meaning without yet knowing how to write" (p. 17). Children who are able to write the letters of the alphabet, print their name, and write other words develop an understanding of the conventions of print and written language.

Text Comprehension

Text comprehension refers to a child's ability to read and process the meaning of ideas represented in text and writing (Snow, 2002). Comprehension is developed in the context of a child's working vocabulary, the ability to relate one's own experience to printed material and text, and the ability to monitor one's understanding of printed material. Text comprehension in the preschool years includes the recognition of pictures and symbols in books and the ability to interpret and infer meaning from what is seen.

Phonological Awareness

Phonological awareness "refers to a general appreciation of the sounds of speech as distinct from their meaning" (Snow, Burns, & Griffin, 1998, p. 51). Phonological

awareness includes a child's ability to hear, identify, and manipulate the spoken units of language. This includes, but is not limited to, rhyming, blending, and segmenting of sounds and words (Armbruster et al., 2003b).

Oral Language

Oral language refers to a shared code that children learn in order to communicate ideas and thoughts. Oral language includes a child's understanding and use of phonological (the rules for combining sounds), morphologic (rules for the internal organization of words), semantic (word meaning), and syntactic (rules that have to do with the order of words in sentences) elements of language (Roskos, Tabors, & Lenhart, 2004).

Listening Comprehension

Listening comprehension refers to a child's ability to listen to, process, and understand the meaning of spoken words and other information heard orally. Comprehension is often demonstrated by answering questions, following directions, predicting story events, requesting information, and interpreting the meaning of what is heard (Biemiller, 2003; Hare & Devine, 1983). Listening comprehension is dependent, in part, on a child's ability to decode what is heard and to interpret meaning or intent based on this decoding. Comprehension is typically related to exposure to a range of oral language experiences and opportunities,

especially ones that actively involve children in listening comprehension activities.

KEY FACTORS INFLUENCING LITERACY LEARNING

It is generally recognized that literacy-related skills develop in the context of young children's positive interactions with materials and people that support literacy learning where skill acquisition is closely related to young children's interests in communication, language, reading, and writing (e.g., Dickinson & Neuman, 2006; Neuman & Dickinson, 2002). According to Bronfenbrenner (1999), learning and development constitute a set of processes that involve the characteristics of a developing person and the social and nonsocial aspects of the environments that influence development. Figure 1 shows the three major sets of person and environment factors influencing early literacy development that are the focus of CELL: Child interests, literacy-rich experiences, and the instructional practices used to promote literacy learning. This model will be used to develop literacy learning practice guides and tool kits that include formal and informal literacy-rich learning experiences and opportunities that are interest based where caregivers and practitioners encourage and support interest-based literacy learning using evidence-based instructional practices.

Child Interests

Many different child characteristics influence early literacy learning (e.g., McNaughton, 1995; Snow et al., 1998). One of the most important is a child's interests and especially a natural curiosity in listening, talking, reading, and writing. Nelson (1999), for example, found that children's language learning and competence were "related easily to the child's life activities and interests" (p. 2). According to Lamme, Sabis-Burns, and Gould (2004), "Reading to children while they are still very young helps them notice the pleasure first, [which] make[s] it easier for them to read for other purposes" (p. 48). Snow et al. (1998) as well made note of the fact that children's interests in literacy is one factor of particular importance for later academic success (see also Frijters, Barron, & Brunello, 2000; Hare & Devine, 1983; Lyytinen, Laakso, & Poikkeus, 1998; McCormick & Mason, 1984; Ortiz, Stowe, & Arnold, 2001; Schiefele, 1999).

Raab and Dunst (2006) recently completed a practice-based research synthesis of interest-based child learning and found both personal and situational interests related to a variety of child outcomes. *Personal interests* are a person characteristic (Bronfenbrenner, 1993) and include a combination of a child's stored knowledge derived from previous experience with objects of interest (e.g., toy, activity, person, idea) and stored value derived from the child's feelings about the experience (Renninger, 1992, 2000; Renninger &

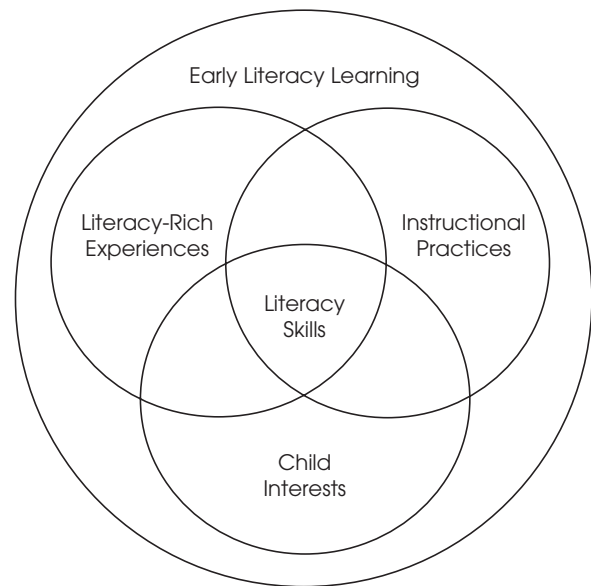


Figure 1. The child and environment factors influencing early literacy learning and development that are the focus of CELL research syntheses and practice-guide development.

Leckrone, 1991). *Situational interests* refer to interests that are triggered by the features, or "interestingness," of the social and nonsocial environment, capturing an individual's attention and encouraging engagement (Krapp, Hidi, & Renninger, 1992).

Interest-based assessment and intervention procedures will be part of the CELL literacy learning tool kits. The practices will include procedures for identifying children's interests and using this information for involving children in interest-based literacy learning opportunities. The assessment and intervention procedures will be based on those developed by Dunst and his colleagues (e.g., Dunst, Acuff, Roberts, & Trivette, 2004; Dunst, Herter, & Shields, 2000; Dunst, Roberts, & Snyder, 2004; Raab, Swanson, Roper, & Dunst, 2006).

Literacy-Rich Experiences

The term literacy-rich experiences is used broadly to refer to environmental arrangements and material availability (e.g., Kaiser, Ostrosky, & Alpert, 1993), the literacy learning opportunities afforded children (e.g., Katims & Pierce, 1995; Lynn, 1997; Neuman & Roskos, 1990), and curricular activities (e.g., Gunn, Simmons, & Kameenui, 1998; Katims, 1991; Notari-Syverson, O'Connor, & Vadasy, 1998) that are used to promote early literacy learning. We now know that these include both *formal experiences* and opportunities provided as part of early intervention, preschool special education, and other preschool experiences (e.g., Dickinson, 1994; Hemmeter et al., 2005; Teale & Martinez, 1988; Watkins, 1996) and *informal experiences* af-

forded children as part of everyday family and community life (e.g., Cairney, 2000; Dunst & Shue, 2005; Frijters et al., 2000; Hull & Schultz, 2001; Storch & Whitehurst, 2001). Cairney (2002), for example, noted that the experiences children have day in and day out in their homes and community, as well as those provided as part of early childhood intervention, contribute to later literacy success.

It is helpful to make a distinction between the types of everyday experiences children have as part of preschool, family, and community life, and how different experiences are likely to have different behavioral and developmental consequences. For example, whereas finger games, rhyming games, and syllable clapping games are likely to be contexts for developing phonological awareness (Anthony & Lonigan, 2004), activities that involve scribbling, drawing, and copying are likely to be contexts for developing writing skills (Strickland & Schickedanz, 2004). One aim of literacy-based interventions is the engagement of children in literacy-rich learning experiences. The provision of literacy-rich learning opportunities that influence the development of literacy skills is expected to provide children the foundations for later literacy success. We know, for example, that early print, oral, and phonological learning awareness experiences and opportunities are important for later literacy competence, including, but not limited to, reading and writing (Pullen & Justice, 2003) and especially learning opportunities that are interest-based (Schiefele, 1999).

Instructional Practices

Cairney (2002, 2003; Cairney & Ruge, 1998) concluded as part of an extensive investigation of early literacy learning in formal (school) and informal (home/community)

settings that the instructional practices that were effective in these different settings were themselves different. In most, but not all, cases, teachers and other early childhood educators are likely to use more structured, formal instructional practices (e.g., explicit instruction) for promoting literacy learning, whereas parents and other caregivers are more likely to use less formal styles of interaction to support literacy learning (e.g., responsive parenting styles).

Table 3 shows a list of both formal and informal instructional practices that are the focus of CELL investigation. Several of these practices have already or are currently being examined in practice-based research syntheses conducted at the Research and Training Center on Early Childhood Development (e.g., contingent responsiveness, incidental teaching, responsive teaching). CELL investigators are examining the effectiveness of other types of instructional practices used frequently by early childhood practitioners (e.g., Gunn et al., 1998; Pearson & Dole, 1987; Vukelich & Christies, 2004; Wray, Medwell, Fox, & Poulson, 2000) and by parents and other caregivers (e.g., Kaiser et al., 1996; Rome-Flanders, Cronk, & Gourde, 1995).

RESEARCH-TO-PRACTICE FRAMEWORK

The information described in the previous sections of this paper were used to develop the framework shown in Figure 2 for: (1) organizing the literacy learning research literature and (2) developing evidence-based literacy learning practice guides and tool kits. The framework includes three periods of early literacy development, two sets of literacy-related competencies, and both the formal and informal literacy learning opportunities that are the contexts for

Table 3
A Categorization Scheme of Formal and Informal Instructional Practices

Instructional Practices	Representative Source
<i>Formal Practices</i>	
Explicit Instruction	Fielding-Barnsley (1997)
Contingent Responsiveness	Rollins (2003)
Incidental Teaching	Warren & Kaiser (1986)
Embedded Instruction	Daugherty, Grisham-Brown, & Hemmeter (2001)
Modeling	Vukelich (1991)
Practitioner Scaffolding	Soderman, Gregory, & O'Neill (1999)
Teacher-Mediated Child Learning	Maimskog & McDonnell (1999)
<i>Informal Practices</i>	
Implicit Instruction	Neuman & Roskos (1993)
Caregiver Responsiveness	Lojkasek, Goldberg, Marcovitch, & MacGregor (1990)
Responsive Teaching	Kaiser et al. (1996)
Response Elaboration	Field (1978)
Imitation	Slaughter & McConnell (2003)
Parent Scaffolding	Rome-Flanders, Cronk, & Gourde (1995)
Parent-Mediated Child Learning	Tzuril (1999)

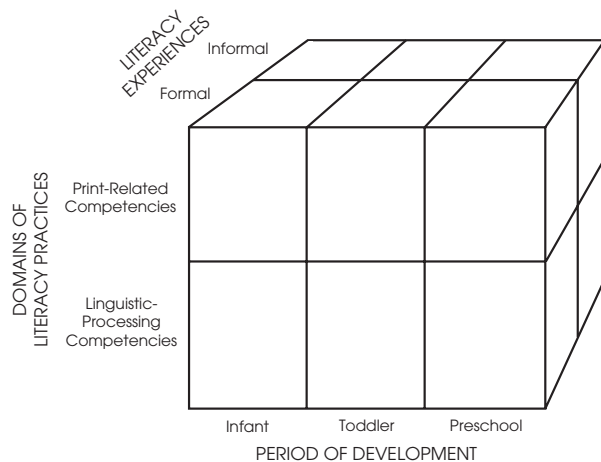


Figure 2. Framework for reviewing the literacy learning literature and developing evidence-based early literacy learning practice guides and tool kits.

literacy-skill acquisition. CELL investigators are reviewing and synthesizing early literacy learning research evidence by systematically identifying those practice characteristics that can be used to develop practice guides and tool kits that early childhood practitioners, parents, and other caregivers can use to promote the early literacy learning of young children, birth to age six, with identified disabilities or developmental delays and children at risk for poor outcomes.

Tool Kits

Six *CELL* toolkits will be developed that include early literacy learning interventions for promoting the development of print-related (e.g., DeBaryshe, Buell, & Binder, 1996; Neuman, Copple, & Bredekamp, 2000; Strickland & Schickedanz, 2004; van Kleeck, 1990) and linguistic-processing (e.g., Dickinson & Tabors, 2001; Lawhon & Cobb, 2002; Vivas, 1996; Wood, 2002) competencies. Infant, toddler, and preschool tool kits of both formal literacy learning interventions and informal literacy learning opportunities will be prepared. The tool kits will include printed material, videos, CD-ROMs, PowerPoint presentations, and other curricular activities.

Practice Guides

The tool kit practice guides will be developed using a simple, but effective, four-step formula. All early literacy learning practices will be developed by answering the following questions: (1) What is the practice? (2) What does the practice look like? (3) How do you do the practice? and (4) How do you know the practice worked? Practice guides will be published as Web-based *CELL* practices (www.early-literacylearning.org).

A unique feature of the practice guides is the inclusion of criteria for assessing the extent to which the practices

have intended benefits. The outcomes, or practice-guide benefit measures, will be aligned with the Office of Special Education’s language and literacy outcomes that currently constitute the focus of state efforts to measure the impact of Part C early intervention and Part B(619) preschool special education.

Tool kit practice guides will include three kinds of interventions: (1) literacy-rich learning opportunities that are contexts for skill acquisition, (2) the instructional practices that can be used to promote early literacy learning, and (3) specialized practices for supporting the literacy learning of children with disabilities or learning difficulties that require more specialized interventions. The latter includes, but is not limited to, the use of augmentative communication devices, computer games, and the use of sign language to facilitate language learning. Figure 3 shows the way in which we envision the content of the tool kits.

The largest number of tool kit practice guides will be ones that include learning opportunities and experiences that *all* children need in order to learn literacy-related skills. These literacy-rich opportunities are expected to be quite varied and provide numerous opportunities for early literacy learning.

Each practice guide will include instructional practices that can be used to support child literacy learning in the context of literacy-rich learning opportunities. The particular instructional practices that are included in each tool kit are expected to be different based on the child’s age (infancy, toddlerhood, or preschool) and the type of literacy learning opportunities (formal or informal).

The specialized practices will be designed specifically to make available interventions found to be effective for promoting the literacy learning of children with disabilities (e.g., Good, Feekes, & Shawd, 1993; McGivern et al.,

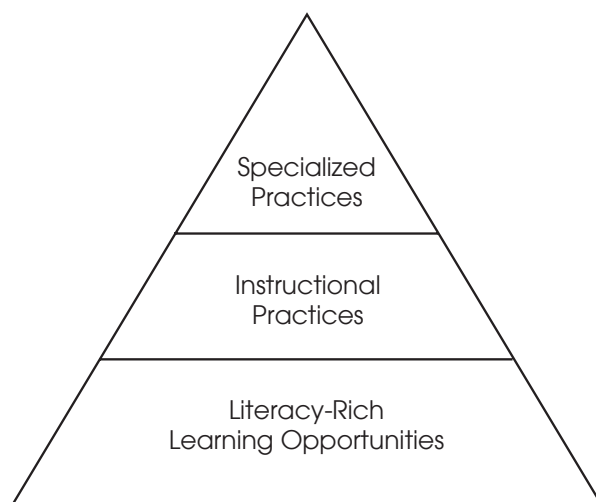


Figure 3. Hierarchy of early literacy learning early childhood intervention practices.

2006). Findings from the CELL research syntheses will be used to identify promising practices that can also be used with children with disabilities.

CONCLUSION

This paper included a description of the framework being used by the Center for Early Literacy Learning (CELL) to develop evidence-based early literacy learning practices. The framework is based on lessons learned at the Research and Training Center on Early Childhood Development (www.researchtopractice.info) and our attempts to bridge the research-to-practice gap (Dunst, Pace, & Hamby, 2006; Dunst & Raab, 2005; Trivette, 2006; Trivette & Dunst, 2005).

The research syntheses completed by CELL investigators will be published as Web-based *CELLreviews* and be prepared in a manner similar to our *Bridges* practice-based research syntheses (<http://www.researchtopractice.info/productBridges.php>). Nontechnical two-page summaries of the practice-based research syntheses will be published as *CELLnotes*. Each will include a description of the major findings from a research synthesis and provide examples of the characteristics of evidence-based practice. *CELLnotes* are prepared especially for practitioners, parents, and other caregivers. All CELL products will be available at www.earlyliteracylearning.org.

The *CELLreviews*, *CELLnotes*, *CELLpractices*, and *CELLtoolkits* will be the foundation for providing both general and specialized technical assistance by the CELL partners (Orelena Hawks Puckett Institute, American Institutes for Research, PACER Center, and University of Connecticut Pappanikou Center). Specialized technical assistance will be used to scale up the adoption and sustained use of literacy learning practices by early childhood intervention programs and practitioners (Dunst, Trivette, Masiello, & McInerney, 2006). CELL defines scaling-up as:

The adoption of policies, practices, and implementation strategies that promote widespread, sustained use of evidence-based early literacy learning practices by early childhood intervention programs serving young children, birth-to-six years of age, and their families, to achieve outcomes that are socially and developmentally important and valued.

A broad-based approach to dissemination and technical assistance is being used to ensure that stakeholders at different levels of the early childhood intervention community are reached. The target groups that will be the focus of dissemination and technical assistance include technical-assistance providers, early childhood program administrators, early childhood practitioners, parents, parent networks, and other caregivers working with or on behalf of infants, toddlers, and preschoolers. The intended benefit is the increased understanding of early literacy learning interven-

tions and the outcomes of these interventions for young children with identified disabilities or developmental delays and those at risk for poor outcomes.

REFERENCES

- Adams, M. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT Press.
- Anthony, J. L., & Lonigan, C. J. (2004). The nature of phonological awareness: Converging evidence from four studies of preschool and early grade school children. *Journal of Educational Psychology, 96*, 43-55.
- Armbruster, B. B., Lehr, F., & Osborn, J. (2003a). *A child becomes a reader: Kindergarten through third grade*. Washington, DC: National Institute for Literacy.
- Armbruster, B. B., Lehr, F., & Osborn, J. (2003b). *Put reading first: The research building blocks for teaching children to read*. Washington, DC: National Institute for Literacy.
- Bates, E., Camaioni, L., & Volterra, V. (1975). The acquisition of performatives prior to speech. *Merrill-Palmer Quarterly, 21*, 205-226.
- Biemiller, A. (2003, Spring). Oral comprehension sets the ceiling on reading comprehension. *American Educator*. Retrieved November 9, 2006, from http://www.aft.org/pubs-reports/american_educator/spring2003/biemiller.html
- Bronfenbrenner, U. (1993). The ecology of cognitive development: Research models and fugitive findings. In R. H. Wozniak & K. W. Fischer (Eds.), *Development in context: Acting and thinking in specific environments* (pp. 3-44). Hillsdale, NJ: Erlbaum.
- Bronfenbrenner, U. (1999). Environments in developmental perspective: Theoretical and operational models. In S. L. Friedman & T. D. Wachs (Eds.), *Measuring environment across the life span: Emerging methods and concepts* (pp. 3-28). Washington, DC: American Psychological Association.
- Bullowa, M. (Ed.). (1979). *Before speech: The beginning of interpersonal communication*. Cambridge, UK: Cambridge University Press.
- Cairney, T. H. (2000). Beyond the classroom walls: The re-discovery of the family and community as partners in education. *Educational Review, 52*, 163-174.
- Cairney, T. H. (2002). Bridging home and school literacy: In search of transformative approaches to curriculum. *Early Child Development and Care, 172*, 153-172.
- Cairney, T. H. (2003). Literacy within family life. In N. Hall, J. Larson, & J. Marsh (Eds.), *Handbook of early childhood literacy* (pp. 85-98). London: Sage.
- Cairney, T. H., & Ruge, J. (1998). *Community literacy practices and schooling: Towards effective support for students*. Canberra, Australia: Commonwealth of Australia, Department of Employment, Training and Youth Affairs.
- Chaney, C. (1994). Language development, metalinguistic

- awareness, and emergent literacy skills of 3-year-old children in relation to social class. *Applied Psycholinguistics*, 15, 371-394.
- Connor, C. M., & Tiedemann, P. J. (2005). *International Reading Association--National Institute for Child Health and Human Development Conference on Early Childhood Literacy Research: A summary of presentations and discussions*. Newark, DE: International Reading Association.
- Daugherty, S., Grisham-Brown, J., & Hemmeter, M. L. (2001). The effects of embedded skill instruction on the acquisition of target and nontarget skills in preschoolers with developmental delays. *Topics in Early Childhood Special Education*, 21, 213-221.
- DeBaryshe, B. D., Buell, M. J., & Binder, J. C. (1996). What a parent brings to the table: Young children writing with and without parental assistance. *Journal of Literacy Research*, 28(1), 71-90.
- DeStefano, L., Dailey, D., Berman, K., & McInerney, M. (2001, May). *Synthesis of discussions about scaling up effective practices* (Contract No. HS97017002). OSEP Work Group: Meeting summary and policy recommendations.
- Dickinson, D. K. (Ed.). (1994). *Bridges to literacy: Children, families, and schools*. Oxford, UK: Blackwell.
- Dickinson, D. K., & Neuman, S. B. (Eds.). (2006). *Handbook of early literacy research: Vol. 2*. New York: Guilford Press.
- Dickinson, D. K., & Tabors, P. O. (Eds.). (2001). *Beginning literacy with language: Young children learning at home and school*. Baltimore: Brookes.
- Dunst, C. J. (in press). Making sense of school readiness research for informing practice. *Early Childhood Services: An Interdisciplinary Journal of Effectiveness*.
- Dunst, C. J., Acuff, F., Roberts, K., & Trivette, C. M. (2004). *Let your child shine! A young child's special interests add sparkle to early literacy*. Morganton, NC: Orelena Hawks Puckett Institute.
- Dunst, C. J., Herter, S., & Shields, H. (2000). Interest-based natural learning opportunities. In S. Sandall & M. Ostrosky (Eds.), *Natural Environments and Inclusion* (Young Exceptional Children Monograph Series No. 2) (pp. 37-48). Longmont, CO: Sopris West.
- Dunst, C. J., Pace, J., & Hamby, D. W. (2006). Evaluation of the *Games for Growing* tool kit for promoting early contingency learning. *Centerscope*, 4(1), 1-13. Available at <http://www.evidencebasedpractices.org/centerscope/centerscopevol5no1.pdf>
- Dunst, C. J., & Raab, M. (2005). Evaluation of an evidence-based practice guide for increasing preschoolers prosocial peer interactions. *Centerscope*, 3(1), 1-7. Available at <http://www.evidencebasedpractices.org/centerscope/centerscopevol4no1.pdf>
- Dunst, C. J., Roberts, K., & Snyder, D. (2004). *Spotting my child's very special interests: A workbook for parents*. Asheville, NC: Winterberry Press.
- Dunst, C. J., & Shue, P. (2005). Creating literacy-rich natural learning environments for infants, toddlers, and preschoolers. In E. M. Horn & H. Jones (Eds.), *Supporting Early Literacy Development in Young Children* (Young Exceptional Children Monograph Series No. 7) (pp. 15-30). Longmont, CO: Sopris West.
- Dunst, C. J., Trivette, C. M., & Cutspec, P. A. (2002). Toward an operational definition of evidence-based practices. *Centerscope*, 1(1), 1-10. Available at <http://www.evidencebasedpractices.org/centerscope/centerscopevol1no1.pdf>
- Dunst, C. J., Trivette, C. M., Masiello, T., & McInerney, M. (2006). Scaling up early childhood intervention literacy learning practices. *CELLpapers*, 1(2).
- Dyson, A. H. (2002). Writing and children's symbolic repertoires: Development unhinged. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research*. New York: Guilford Press.
- Early Childhood Education and School Readiness Work Group. (2002, June). *Early childhood education and school readiness: Conceptual models, constructs, and measures*. Washington, DC: U.S. Department of Health and Human Services.
- Early Reading First Preliminary Guidance. (2002, March). *Draft guidance for the early reading first program: Subpart B, Part B, Title I of the Elementary and Secondary Education Act of 1965 (ESEA) as amended by No Child Left Behind Act of 2001*. Washington, DC: United States Department of Education.
- Ferreiro, E., & Teberosky, A. (1982). *Literacy before schooling*. Exeter, NH: Heinemann.
- Field, T. (1978). The three Rs of infant-adult interactions: Rhythms, repertoires, and responsivity. *Journal of Pediatric Psychology*, 3, 131-136.
- Fielding-Barnsley, R. (1997). Explicit instruction in decoding benefits children high in phonemic awareness and alphabet knowledge. *Scientific Studies of Reading*, 1, 85-98.
- Fitts, B. P. (2005, October). *National early literacy panel: A synthesis of scientific research on young children's early literacy development*. Presentation made at the Ohio Department of Education Early Childhood Conference, Columbus, OH.
- Frijters, J. C., Barron, R. W., & Brunello, M. (2000). Direct and mediated influences of home literacy and literacy interest on prereaders' oral vocabulary and early written language skill. *Journal of Educational Psychology*, 92, 466-477.
- Goin, R. P., Nordquist, V. M., & Twardosz, S. (2004). Parental accounts of home-based literacy processes: Contexts for infants and toddlers with developmental delays. *Early Education and Development*, 15, 187-214.
- Good, L. A., Feeles, J., & Shawd, B. (1993). Let your fingers

- do the talking: Hands-on language learning through signing. *Childhood Education*, 70, 81-83.
- Gunn, B. K., Simmons, D. C., & Kameenui, E. J. (1998). Emergent literacy: Instructional and curricular basics and implications. In D. C. Simmons & E. J. Kameenui (Eds.), *What reading tells us about children with diverse learning needs* (pp. 51-59). Mahwah, NJ: Erlbaum.
- Hall, N., Larson, J., & Marsh, J. (Eds.). (2003). *Handbook of early childhood literacy*. Thousand Oaks, CA: Sage.
- Hare, V. C., & Devine, D. A. (1983). Topical knowledge and topical interest predictors of listening comprehension. *Journal of Educational Research*, 76, 157-160.
- Havlik, B. S. (2003). Maternal bookreading style and children's literacy and language development. *Dissertation Abstracts International*, 63(12), 6120B. (UMI No. 3073932).
- Hemmeter, M. L., McCollum, J., & Hsieh, W.-Y. (2005). Practical strategies for supporting emergent literacy in the preschool classroom. In E. M. Horn & H. Jones (Eds.), *Supporting Early Literacy Development in Young Children* (Young Exceptional Children Monograph Series No. 7) (pp. 59-74). Longmont, CO: Sopris West.
- Holdgrafer, G., & Dunst, C. J. (1986). Communicative competence: From research to practice. *Topics in Early Childhood Special Education*, 6(3), 1-22.
- Holdgrafer, G. E., & Dunst, C. J. (1991). Developmental changes in early communicative competence. *Infant-Toddler Intervention: The Transdisciplinary Journal*, 1, 255-273.
- Hull, G., & Schultz, K. (2001). Literacy and learning out of school: A review of theory and research. *Review of Educational Research*, 71, 575-611.
- Justice, L. M., & Ezell, H. K. (2001). Word and print awareness in 4-year-old children. *Child Language Teaching and Therapy*, 17, 207-225.
- Kaiser, A. P., Hemmeter, M. L., Ostrosky, M. M., Fischer, R., Yoder, P., & Keefer, M. (1996). The effects of teaching parents to use responsive interaction strategies. *Topics in Early Childhood Special Education*, 16, 375-406.
- Kaiser, A. P., Ostrosky, M. M., & Alpert, C. L. (1993). Training teachers to use environmental arrangement and milieu teaching with nonvocal preschool children. *Journal of the Association for Persons with Severe Handicaps*, 18, 188-199.
- Katims, D. S. (1991). Emergent literacy in early childhood special education: Curriculum and instruction. *Topics in Early Childhood Special Education*, 11(1), 69-84.
- Katims, D. S., & Pierce, P. L. (1995). Literacy-rich environments and the transition of young children with special needs. *Topics in Early Childhood Special Education*, 15, 219-234.
- Krapp, A., Hidi, S., & Renninger, K. (1992). Interest, learning and development. In K. Renninger, S. Hidi, & A. Krapp (Eds.), *The role of interest in learning and development* (pp. 3-25). Hillsdale, NJ: Erlbaum.
- Lamme, L. L., Sabis-Burns, D., & Gould, J. (2004). Project booktalk: Library books and lap reading in childcare homes. *Early Childhood Education Journal*, 32, 45-50.
- Lawhon, T., & Cobb, J. B. (2002). Routines that build emergent literacy skills in infants, toddlers, and preschoolers. *Early Childhood Education Journal*, 30, 113-118.
- Liszkowski, U., Carpenter, M. J., Henning, A., Striano, T., & Tomasello, M. (2004). Twelve-month-olds point to share attention and interest. *Developmental Science*, 7, 297-307.
- Lojkasek, M., Goldberg, S., Marcovitch, S., & MacGregor, D. (1990). Influences on maternal responsiveness to developmentally delayed preschoolers. *Journal of Early Intervention*, 14, 260-273.
- Lonigan, C. J. (2006). Development, assessment, and promotion of preliteracy skills. *Early Education and Development*, 17, 91-114.
- Lynn, L. (1997). Language-rich home and school environments are key to reading success. *Harvard Education Letter*. Retrieved April 7, 2005, from <http://www.ed-letter.org/past/issues/1997-ja/language.shtml>
- Lyytinen, P., Laakso, M. L., & Poikkeus, A.-M. (1998). Parental contribution to child's early language and interest in books. *European Journal of Psychology of Education*, 13, 297-308.
- Maimskog, S., & McDonnell, A. P. (1999). Teacher-mediated facilitation of engagement by children with developmental delays in inclusive preschools. *Topics in Early Childhood Special Education*, 19, 203-216.
- McCormick, C. E., & Mason, J. M. (1984, April). *Intervention procedures for increasing preschool children's interest in and knowledge about reading*. (Technical Report No. 312). Champaign, IL: Center for the Study of Reading (ERIC Document Reproduction Service No. ED244222).
- McGivern, R. F., Rodriguez, A., Hilliard, V. R., Fielding, B., Anderson, J., Shapiro, L. P., & Reilly, J. S. (2006). Improving preliteracy and pre-math skills of Head Start children with classroom computer games. *Early Childhood Services: An Interdisciplinary Journal of Effectiveness*, 1.
- McNaughton, S. (1995). *The patterns of emergent literacy: Processes of development and transition*. Oxford: Oxford University Press.
- Morrow, L. M. (2001). Literacy development and young children: Research to practice. In S. L. Golbeck (Ed.), *Psychological perspectives on early childhood education: Reframing dilemmas in research and practice* (pp. 253-279). Mahwah, NJ: Erlbaum.
- National Early Literacy Panel. (2006, March). *Findings from the National Early Literacy Panel: Providing a focus for early language and literacy development*. Presentation at the annual conference of the National Center for Family Literacy, Louisville, KY.

- Nelson, K. (1999, Winter). Making sense: Language and thought in development. *Developmental Psychologist*, 1-10.
- Neuman, S. B., Copple, C., & Bredekamp, S. (2000). *Learning to read and write: Developmentally appropriate practices for young children*. Washington, DC: National Association for the Education of Young Children (NAEYC).
- Neuman, S. B., & Dickinson, D. K. (Eds.). (2002). *Handbook of early literacy research*. New York: Guilford Press.
- Neuman, S. B., & Roskos, K. (1990). The influence of literacy-enriched play settings on preschoolers' engagement with written language. *National Reading Conference Yearbook*, 39, 179-187.
- Neuman, S. B., & Roskos, K. (1993). Access to print for children of poverty: Differential effects of adult mediation and literacy-enriched play settings on environmental and functional print tasks. *American Educational Research Journal*, 30, 95-122.
- Neuman, S. B., & Roskos, K. (1997). Literacy knowledge in practice: Contexts of participation for young writers and readers. *Reading Research Quarterly*, 32, 10-32.
- Nodelman, P. (2001). A is for . . . what? The function of alphabet books. *Journal of Early Childhood Literacy*, 1, 235-253.
- Notari-Syverson, A., O'Connor, R. E., & Vadasy, P. F. (1998). *Ladders to literacy: A preschool activity book*. Baltimore: Brookes.
- Ortiz, C., Stowe, R. M., & Arnold, D. H. (2001). Parental influence on child interest in shared picture book readings. *Early Childhood Research Quarterly*, 16, 263-281.
- Papousek, M. (1995). Origins of reciprocity and mutuality in prelinguistic parent-infant 'dialogues'. In I. Markova & M. Papousek (Eds.), *Mutualities in Dialogue* (pp. 58-81). New York: Cambridge University Press.
- Parlakian, R. (2003). *Before the ABCs: Promoting school readiness in infants and toddlers*. Washington, DC: Zero to Three.
- Pearson, P. D., & Dole, J. A. (1987). Explicit comprehension instruction: A review of research and a new conceptualization of instruction. *Elementary School Journal*, 88, 151-165.
- Pullen, P. C., & Justice, L. M. (2003). Enhancing phonological awareness, print awareness, and oral language skills in preschool children. *Intervention in School and Clinic*, 38, 87-98.
- Raab, M., & Dunst, C. J. (2006). Influence of child interests on variations in child behavior and functioning. *Bridges*, 4(4), 1-22. Available at http://www.evidence-basedpractices.org/bridges/bridges_vol4_no4.pdf
- Raab, M., Swanson, J., Roper, N., & Dunst, C. J. (2006). Promoting parent and practitioner identification of interest-based everyday child learning opportunities. *CASEtools*, 2(6), 1-19. Available at http://www.fip-case.org/casetools/casetools_vol2_no6.pdf
- Renninger, K. A. (1992). Individual interest and development: Implications for theory and practice. In K. A. Renninger, S. Hidi, & A. Krapp (Eds.), *The role of interest in learning and development* (pp. 361-395). Hillsdale, NJ: Erlbaum.
- Renninger, K. A. (2000). Individual interest and its implications for understanding intrinsic motivation. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 373-404). San Diego, CA: Academic Press.
- Renninger, K. A., & Leckrone, T. G. (1991). Continuity in young children's actions: A consideration of interest and temperament. In L. Oppenheimer & J. Valsiner (Eds.), *The origins of action: Interdisciplinary and international perspectives* (pp. 205-238). New York: Springer-Verlag.
- Rollins, P. R. (2003). Caregivers' contingent comments to 9-month-old infants: Relationship with later language. *Applied Psycholinguistics*, 24, 221-234.
- Rome-Flanders, T., Cronk, C., & Gourde, C. (1995). Maternal scaffolding in mother-infant games and its relationship to language development: A longitudinal study. *First Language*, 15, 339-355.
- Roskos, K. A., Tabors, P. O., & Lenhart, L. A. (2004). *Oral language and early literacy in preschool*. Newark, DE: International Reading Association.
- Schickedanz, J. A. (1999). *Much more than the ABCs: The early stages of reading and writing*. Washington, DC: National Association for the Education of Young Children.
- Schiefele, U. (1999). Interest and learning from text. *Scientific Studies of Reading*, 3, 257-279.
- Shanahan, T. (2005). What the National Early Literacy Panel tells us about early literacy. In C. M. Connor & P. J. Tiedemann (Eds.), *International Reading Association-National Institute for Child Health and Human Development Conference on Early Childhood Literacy Research: A summary of presentations and discussions* (pp. 9-13). Newark, DE: International Reading Association.
- Slaughter, V., & McConnell, D. (2003). Emergence of joint attention: Relationships between gaze following, social referencing, imitation, and naming in infancy. *Journal of Genetic Psychology*, 164, 54-71.
- Snow, C. (2002). *Reading for understanding: Toward an R&D program in reading comprehension*. New York: RAND Corporation.
- Snow, C. E., Burns, M. S., & Griffin, P. (Eds.). (1998). *Preventing reading difficulties in young children*. Washington, DC: National Academy Press.
- Soderman, A. K., Gregroy, K. M., & O'Neill, L. T. (1999). *Scaffolding emergent literacy: A child-centered approach for preschool through grade 5*. Boston: Allyn and Bacon.
- Storch, S. A., & Whitehurst, G. J. (2001). The role of family and home in the literacy development of children from low-income backgrounds. *New Directions for Child and Adolescent Development*, 92, 53-71.

- Strickland, D. S., & Schickedanz, J. A. (2004). *Learning about print in preschool*. Newark, DE: International Reading Association.
- Teale, W. H., & Martinez, M. G. (1988). Getting on the right road: Bringing books and young children together in the classroom. *Young Children*, 44(1), 10-15.
- Treiman, R., & Kessler, B. (2003). The role of letter names in the acquisition of literacy. In R. Kail (Ed.), *Advances in child development and behavior*. Vol. 31 (pp. 105-135). San Diego, CA: Academic Press.
- Trevarthan, C. (1979). Communication and cooperation in early infancy: A description of primary intersubjectivity. In M. Bullock (Ed.), *Before speech: The beginning of interpersonal communication* (pp. 321-347). Cambridge, UK: Cambridge University Press.
- Trivette, C. M. (2003). Influence of caregiver responsiveness on the development of young children with or at risk for developmental disabilities. *Bridges*, 1(3), 1-13. Available at http://www.evidencebasedpractices.org/bridges/bridges_vol1_no3.pdf
- Trivette, C. M. (2006). Evaluation of a tool kit for promoting increased use of parent responsiveness to child behavior. *Centerscope*, 5(2), (in press).
- Trivette, C. M., & Dunst, C. J. (2005). Evaluation of the *Tune In* video practice guide for increasing young children's engagement with caregivers. *Centerscope*, 3(2), 1-5. Available at <http://www.evidencebasedpractices.org/centerscope/centerscopevol4no2.pdf>
- Tzuriel, D. (1999). Parent-child mediated learning interactions as determinants of cognitive modifiability: Recent research and future directions. *Genetic, Social and General Psychology Monographs*, 125, 109-157.
- van Kleeck, A. (1990). Emergent literacy: Learning about print before learning to read. *Topics in Language Disorders*, 10(2), 25-45.
- van Kleeck, A. (1998). Preliteracy domains and stages: Laying the foundations for beginning reading. *Journal of Children's Communication Development*, 20, 33-51.
- Vivas, E. (1996). Effects of story reading on language. *Language Learning*, 46, 189-216.
- Vukelich, C. (1991). Materials and modeling: Promoting literacy during play. In J. F. Christie (Ed.), *Play and early literacy development* (pp. 215-231). New York: State University of New York Press.
- Vukelich, C., & Christies, J. (2004). *Building a foundation for preschool literacy: Effective instruction for children's reading and writing development*. Newark, DE: International Reading Association.
- Warren, S. F., & Kaiser, A. P. (1986). Incidental language teaching: A critical review. *Journal of Speech and Hearing Disorders*, 51, 291-299.
- Wasik, B. A. (2001). Teaching the alphabet to young children. *Young Children*, 56(1), 34-40.
- Watkins, R. V. (1996). Natural literacy: Theory and practice for preschool intervention programs. *Topics in Early Childhood Special Education*, 16, 191-212.
- Whitehurst, G. J., & Lonigan, C. J. (2001). Emergent literacy: Development from prereaders to readers. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research* (pp. 11-29). New York: Guilford Press.
- Wolery, M., & Sainato, D. M. (1996). General curriculum and intervention strategies. In S. L. Odom & M. E. McLean (Eds.), *Early intervention/early childhood special education: Recommended practices* (pp. 125-158). Austin, TX: PRO-ED.
- Wood, C. (2002). Parent-child pre-school activities can affect the development of literacy skills. *Journal of Research in Reading*, 25, 241-258.
- Wray, D., Medwell, J., Fox, R., & Poulson, L. (2000). The teaching practices of effective teachers of literacy. *Educational Review*, 52, 75-84.

ACKNOWLEDGMENTS

Appreciation is extended to Christy Kavulic, Ph.D., and Jennifer Tschantz, Ph.D., for their feedback and comments on an earlier version of the paper. The opinions expressed, however, are those of the authors and do not necessarily reflect the official position of the U.S. Department of Education, Office of Special Education Programs.

AUTHORS

Carl J. Dunst, Ph.D., and Carol M. Trivette, Ph.D., are Co-Directors of the Orelena Hawks Puckett Institute in Asheville and Morganton, North Carolina, and Principal Investigators of the Center for Early Literacy Learning (CELL). Tracy Masiello, Ph.D., and Nicole Roper, Ed.D., are Associate Research Scientists at the Puckett Institute. Anya Robyak, M.Ed., M.F.A., is a Research Associate at the Puckett Institute.