

Environmental Print Awareness in Young Children

Danielle Z. Kassow

Talaris Research Institute, Seattle, Washington

Print is omnipresent in literate societies. Young children begin taking notice of and interacting with print in their environment, and are able to identify or “read” the familiar print seen around them beginning at an early age. Questions pertaining to whether or not children are actually reading when they “read” environmental print were the focus of this research summary. Based on the seminal research included in this summary, results indicated that when children “read” environmental print they are actually “reading” or recognizing the cues around the print rather than the print itself. Further, research has not yet been able to establish a relationship between environmental print awareness and later literacy skills. The value of recognizing environmental print is that children are beginning to understand that print means something and they are attempting to make sense of the world around them. Implications for parents and other caregivers are discussed.

Introduction

Print is everywhere in our world: signs, billboards, product labels, books, television, fast food logos, even logos on clothing (Manning, 2004; Westwood, 2004). Proficient readers may notice that their eyes automatically read the print around them and, in fact, it is hard not to read the print seen in the environment (Guttentag & Haith, 1979). Beginning at an early age, young children actively engage with the print in their world. Parents and caregivers may observe children reciting words, signs, symbols, or logos that they recognize in their environment, such as *McDonald's*, *Coke*, *Crest*, *Stop*. But are young children actually reading the print they see or are they reading the contextual cues around the print (e.g., graphics, colors) to identify those words (McGee, 1986)? When children “read” environmental print, what does that tell us about young children’s emerging literacy skills? Environmental print awareness is the ability to recognize signs, symbols, and words that occur frequently in the environment (Westwood, 2004).

The purpose of this research summary is to examine and explain environmental print awareness in young children. Questions pertaining to whether or not children are actually reading when they “read” environmental print, and the relationship between young children’s environmental print awareness and later literacy skills, will be explored. Additionally, ways in which parents and other caregivers can support young children’s emerging literacy skills, including their natural curiosity about print, will be discussed.

Background

Environmental Print Awareness

Environmental print is the print seen in our immediate surroundings and used in our everyday lives. Environmental print is also the print found in the natural environment of the child, or the child’s immediate ecology (Kirkland, Aldridge, & Kuby, 1991). Environmental print appears in many contexts and formats, and its utility in life is invaluable and powerful (Fingon, 2005). For instance, examination of urban settings demonstrates the omnipresence of print: signs for stores and businesses, advertisements in storefronts, street signs, graffiti, billboards, and signs on the sides of buses. Print in city environments offers opportunities for children to view and engage with print in many different forms, full of historical, cultural, and contextual meanings (Orellana & Hernandez, 1999). Community can be a tool to help children read words and their world (Freire, 1970).

Environmental print awareness is demonstrated when children recognize familiar symbols and words, and display understanding and knowledge that print carries meaning (American Speech-Language-Hearing Association, 2001). Marie Clay (1993) noted that young children explore details of print in their environments. In print-rich environments young children are continuously interacting with, organizing, and analyzing the meanings of visible print (Goodman, 1986). Studies of environmental print indicate that children do develop concepts and construct knowledge about the functions and uses of print through engagement with print in everyday or natural environments (Kirkland et al., 1991; Teale,

1987). Whitehurst and Lonigan (1998) explain that environmental print is a sample measure of pretending to read, and pretending to read is a component of emergent reading. Emergent reading consists of a set of skills and processes referred to as *outside-in processes*, defined as children's understanding of the context or knowledge of the world in which the writing they are trying to read occurs (Whitehurst & Lonigan, 1998). In other words, when children see signs, labels, logos, and print they utilize their existing knowledge of the environment to understand the context of the print they see and they pretend to read it. Children are generally able to recognize environmental print before they are able to read print in books (Kuby & Aldridge, 2004; Whitehurst & Lonigan, 1998).

Parents may observe their child's awareness that written language carries meaning when their child points to something and asks what it says (Goodman, 1986). Beginning at an early age, parents may also observe their child reading printed words found in the environment (Fingon, 2005; McGee, 1986). While parents have been aware of their child's active engagement with printed words for a long time, young children's environmental print reading is of recent interest to researchers. Interest in environmental print awareness arose partly due to studies from the 1960s and 1970s, identifying early readers, in which parents described their child's interest in print on signs and labels (McGee, 1986). Literacy researchers demonstrated their interest in this area by examining how children read the print in the world around them (Teale & Sulzby, 1986). Studies investigating young children's knowledge of environmental print awareness were conducted due to the presumed relationship between environmental print awareness and literacy development (McGee, 1986).

Currently, standardized measures to assess environmental print awareness skills in young children do not exist (Whitehurst & Lonigan, 1998). To assess environmental print awareness researchers have primarily designed tasks to demonstrate children's abilities to "read" print in the environment through use of contextual cues (Goodman, 1986). These tasks have generally included showing children product labels or pictures of familiar signs, for example McDonald's (Whitehurst & Lonigan, 1998), in their natural pictorial contexts (Cloer, Aldridge, & Dean, 1981/1982). Cloer et al. (1981/1982) noted that "context dependent" words are unique patterns that only have meaning in certain contexts that include color, print style, symbols, objects, or pictures. While research has shown that children are able to derive meaning of text within context, studies have not been able to establish or

support a direct casual relationship between the ability to read environmental print and later word identification (Whitehurst & Lonigan, 1998). Hence, while recognition of environmental print is a developmental accomplishment of literacy acquisition (Snow, Burns, & Griffin, 1998), it has not been found to be strongly related to later reading (Whitehurst & Lonigan, 1998). Further, reading words in the environment may be the lowest level of a hierarchy of word knowledge skills (Goodall, 1984).

While not the focus of this summary, it is important to note and make a distinction between *environmental print awareness* and *print awareness* (or concepts of print). While there is some overlap between these two concepts, they are actually quite distinct from one another. Print awareness is a set of skills that children gradually come to learn and understand (Lesiak, 1997). Some of the basic elements of print awareness include: understanding the difference between letters and words; knowing the difference between graphic displays of words and graphic displays made up of nonwords; knowing that print is print no matter what tool was used to record it (e.g., chalk, ink); understanding that print corresponds to speech and gradually learning the phonemes associated with different letters; understanding that words are read from left to right in Western alphabets; and understanding that lines of text are read from top to bottom (Durkin, 1993; Lesiak, 1997; Whitehurst & Lonigan, 1998). Print awareness elements are the product of multiple experiences with print and are not developed one at a time (Durkin, 1993). Some studies have found that children learn concepts of print through engagement in a print-rich environment and that print awareness is related to reading achievement (Reutzel, Oda, & Moore, 1989). In sum, print awareness and environmental print awareness are distinct concepts because the former focuses on discrete skills that children would presumably learn through multiple interactions via instruction (Lesiak, 1997), and the latter seems to develop through children's natural engagements with their environments (Kirkland et al., 1991).

Development of Symbolism

The fact that young children have not yet learned to read, but have begun to recognize familiar print and logos, is interesting to contemplate in terms of what is occurring in their cognitive development during this period. One of the most important cognitive achievements of early childhood and the early school years is the ability to understand and use symbols (Bialystok & Martin, 2003; DeLoache, 2000). According to Piaget (cited in Ginsburg &

Opper, 1988), children begin to demonstrate the appearance of semiotic, or symbolic, function around the age of two. Young children begin to develop the ability to make something stand for or represent something else which is not present (Ginsburg & Opper, 1988). This skill is often seen during symbolic play (Lillard, 1993), such as when a child uses a cardboard tube as a racecar. Universally, children acquire language and master symbolic artifacts of their culture. However, becoming skilled in symbolic functions is quite challenging and does not happen in a stage-like manner, but rather depends on the characteristics of the symbol itself and the context of the situation (DeLoache, 2000).

Bialystok and Martin (2003) studied young children's development from representational to symbolic thought for print by investigating whether children who have learned letters also understand that letters are the symbols through which print reveals meaning. To accomplish this, the researchers conducted *moving word tasks* with children who were four and five years old. During these tasks children are presented with a word on a card, such as "dog," and then the card is placed beside a toy dog. The card is then placed next to a toy house. Under the varying contexts of card placement, the children are asked what the card says. If children understand that print is symbolic they will know that the card says "dog," no matter where it is placed. Bialystok and Martin (2003) found that children consistently named the picture closest to the card. Thus, if the card was next to the dog, children said "dog," but if the card was placed next to the house, children said "house." These studies demonstrated that children consider print a reflection of the context rather than knowing that print is a symbol (Bialystok & Martin, 2003).

Although the relationship between environmental print awareness and symbolic functions has not been previously examined and cannot be determined from existing studies, it is interesting to think about the potential relationships between these skills. Bialystok and Martin (2003) explained that, despite young children's lack of understanding about the symbolic nature of print, children know that print has meaning. Perhaps this is not unlike how children think about environmental print.

Purpose

Based on the above review of literature, the purpose of the current summary of seminal research is to examine and discuss the relationships between environmental print awareness and emergent reading in young children. Specifically, four questions regarding the outcomes of environmental print

awareness studies will be examined: (1) Can young children read environmental print in context?, (2) Can young children read environmental print out of context?, (3) When young children "read" environmental print are they actually reading or are they reading the graphic cues around the print?, and (4) What is the relationship between environmental print awareness and literacy skills in young children? In addition, ways in which parents can support and encourage their child's environmental print awareness and natural curiosity about print in their environment will be discussed.

Summary of Seminal Research

Search Strategy and Sources

In an effort to obtain relevant studies and seminal research on the topic of environmental print awareness, the following search terms were utilized: environmental print awareness, environmental print, print awareness, print literacy, environmental literacy, parent-child interactions, everyday learning, and natural environments. A search using the following author names was also conducted: Jerry Aldridge, Marie Clay, Yetta Goodman, Lynn Kirkland, Patricia Kuby, Tommie Lawhon, Richard G. Lomax, Lea M. McGee, Jana Mason, and Lesley Morrow. Electronic databases were searched using the search terms and names listed above. These databases included: Psychological Abstracts online (PsycINFO), Educational Resource Information Center (ERIC), Social Science Citation Index (SSCI), National Library of Medicine (Entrez PubMed). An online search via the Google and Google Scholar search engines, as well as hand searches of relevant journal articles, book chapters, and reference sections of relevant sources were also conducted. A thorough review of relevant abstracts and selected articles lead to the selection of seminal bodies of work that are summarized below.

Environmental Print Awareness

In an early study of environmental print, Hiebert (1978) utilized classic or typical environmental print procedures for examining the phenomena in young children. Forty children, ranging in age from 3 years old to 4.11 years old, from three day care centers in the Midwest, participated in the study. The children were screened on a formal reading task and one early reader was excluded from the study; only nonreaders were included in the sample. Stimulus environmental print words were then selected by adult judges based on how frequently the words were seen in the environment. The stimulus words included McDonald's, Coca-Cola, stop, Sesame Street, milk, cookies, Madison (Wisconsin), M&Ms, CBS, and A

& P (a grocery store). The words were then produced on slides under each of the following conditions: (1) "In context," in which slides were taken of the word in its environmental context; and (2) "Out of context," in which the words were written in black, lowercase print, 3/4 inch high, on white tagboard, and slides were made of these cards. In two separate testing sessions, the examiner asked the children "what might this say" as the examiner pointed to the stimulus word on a screen. Errors in identification were generally one of the following: (1) no response or did not know; (2) meaning-related error: the error made sense given the word (e.g., saying soda instead of saying Coca-Cola); (3) idiosyncratic error: the error did not make sense; or (4) a string of words not related to the stimulus word (Hiebert, 1978).

Hiebert (1978) found that younger children made more errors than older children, more "out of context" than "in context" errors, and made more errors on letter tasks (identifying CBS or A & P) than on word tasks. These results were significant at the $p < .001$ level. The majority of errors "in context" were meaning-related errors, while the errors "out of context" were generally no response or an idiosyncratic type. These results were also significant at the $p < .001$ level. Age by error-type analyses were non-significant, indicating that younger and older children did not differ on types of errors made. Hiebert noted that the high proportion of meaningful errors and a greater number of correct responses in context indicated that preschoolers knew how to use the environment (or context around the word) to make sense of written language when a word is presented in context. The fact that the children made more errors "out of context" may indicate that while children may appear to be "reading" words in context, once contextual cues are removed, the children are not able to "read." In this study it was clear that young children were acquiring knowledge about the written environment and without formal instruction. Presumably young children become better at identifying environmental print with age, and are generally better at identifying environmental print when it is presented in its typical format, that is, "in context" (Hiebert, 1978).

Cloer et al. (1981/1982), utilized similar procedures to examine environmental print awareness with 71 African-American children ranging in age from 3 years old to 6 years old in rural Alabama. The instrument used for assessing young children's environmental print awareness was an adaptation of Ylisto's (1967) work, and it included 24 common print symbols found in the local community. Words included Jello, Coca-Cola, Campbell's Tomato Soup, Band-Aid, and McDonald's; for a complete list see Cloer et al. (1981/1982). The test items were

presented in five different contexts: (A) the tangible product in its natural setting; (B) a xerox copy of the actual product, thus no color print; (C) a xerox copy of the actual product with background cues removed from the print, thus no color print or pictures; (D) symbol presented in standard manuscript; and (E) symbol presented in a sentence; level E was omitted from the data analyses because it was too difficult for the children. During individual test sessions the examiner pointed to the stimulus words and asked the children, "What does this say?"

Unlike Hiebert (1978), types of errors were not scored. Rather, correct and incorrect responses were recorded, and the total number of correct responses for each of the five test contexts was totaled separately. Analysis of the data indicated that, with each context level, and progressive removal of visual cues from the print logo, participants' mean scores decreased on each level, and the decreased scores between contexts were significant at $p < .001$ level. For instance, the mean score on level A was 21.23, indicating that the children were able to identify the tangible product. However when a Xerox copy of the tangible product was presented (level B), the mean score was 13.62, indicating that accuracy or ability to identify the information decreased. Further, the differences in the scores between A and B were significantly different ($t = 8.42, p < .001$), indicating that the slight change in contextual cue resulted in decreased scores. When the context of the product was further altered (removal of graphic pictures) as in level C, mean score further decreased to 6.23. The mean score of level C was also significantly different from level A ($t = 11.06, p < .001$). The reader is referred to Tables 1 and 2 in Cloer et al. (1981/1982) for a complete view of the data analyses. In sum, the analyses indicated that, as the context of the product was increasingly removed, children's scores in identifying the print decreased. The decreases were statistically significant, indicating that each level or stage was increasingly difficult for the children.

In a study that was an extension of Hiebert (1978), Goodall (1984) examined environmental print awareness in 20 Australian children, ranging in age from 4.3 years old to 5.4 years old. The children all attended kindergarten for 2.5 hour sessions, 4 days a week, and had no formal reading instruction. Similar to the previous studies, children were presented with environmental print words such as McDonald's, Lego, Coca-Cola, and milk, in full and partial contexts, and asked, "What does this say?"

Like Hiebert (1978), Goodall (1984) examined the types of responses that children gave: correct response, close in meaning, incorrect but makes sense, does not make sense, or the child did not know or did not answer. Goodall found results similar to

Hiebert. Specifically, under full context conditions, 69% of the children accurately identified words or were close in meaning. Under partial context conditions, the percentage of accuracy dropped to 32%, and 48% of the children said they did not know or they had no response. The two most frequently identified words in partial context were McDonald's and Coca-Cola. Goodall concluded that, while young children were aware that print conveys information, they were not necessarily able to use it accurately, particularly when cues were diminished.

Masonheimer, Drum, & Ehri (1984) examined the environmental print reading skills of preschoolers who demonstrated "expertise" at reading signs and labels to determine if these "experts" would notice differences in letter alterations of the familiar signs and labels. Masonheimer et al. (1984) hypothesized that if skill at reading environmental print was a precursor of reading, the skills of the "experts" should not decline much with the removal of context cues.

None of the children who participated in the study had received formal reading or alphabet instruction at school. Participants included 228 preschoolers, ranging in age from 2 years old to 5 years old, from a wide variety of ethnic and socioeconomic backgrounds. As with previous studies, the environmental print measures included familiar labels or signs, in addition to identifying letters of the alphabet and primer words (e.g., in, out, go). The authors conducted two experiments. The results of the first experiment demonstrated that children's ability to "read" environmental print stems from familiarity with context cues and not alphabetic cues, that full context is best, and that color is not an important cue. These results did not vary significantly by age. Further, very few of the children had any word reading skills and it was determined that word reading skills do not evolve from environmental print reading skills. In the second experiment, the researchers focused on whether subjects would attend to or ignore letters in familiar labels when reading the labels. As in other studies, Masonheimer et al. (1984) found that children who were considered to be "readers" focused on letters and "pre-readers" ignored the letters and "read" the environment. In sum, the authors were not able to find evidence that indicated children move from "reading" environmental print to word reading. Perhaps the lack of a relationship between environmental print awareness skills and word reading skills in this study is due to the fact that a child does not need to look beyond the contextual cues of the environmental print to be able to identify the information. That is, there is no reason to identify the letters because the cues in the sign or

label provide enough information (Masonheimer et al., 1984).

Further evidence illustrates the difficulty in establishing a relationship between environmental print awareness skills and reading skills. Dickinson and Snow (1987) examined the pre-reading and oral language skills, such as alphabet knowledge, decoding, and environmental print, of 33 kindergarten children from low and high socioeconomic backgrounds. Study results indicated very weak and non-significant relationships between environmental print and other measures of early reading and writing ability, suggesting that environmental print is a poor predictor of later reading achievement. The authors noted that the ability to recognize signs and labels develops early in all young children from literate environments, is found in children from racially, linguistically, geographically, and ethnically diverse backgrounds, and does not necessarily lead to other reading skills, such as decoding (Dickinson & Snow, 1987).

In a study similar to Morrow (1990), Neuman and Roskos (1993) examined how adults can affect children's environmental print learning in a play setting. The authors were operating from a Vygotskian ideology and they noted that, "as a literacy event, environmental print knowledge is mediated through social interaction and does not necessarily come about through exposure alone" (Neuman & Roskos, 1993, p. 96). "Reading" environmental print is therefore highly dependent on the context and a set of cues, including people, place, and purpose. Neuman and Roskos (1993) further noted that opportunities to engage in environmental print events are not equally available for all children.

The authors purposely conducted an environmental print study with young children and parents who were economically challenged and may have had poor or infrequent access to print in the home. Unlike other environmental print studies that utilized common product labels for testing materials, Neuman and Roskos devised a literacy-enriched office play setting where environmental print was displayed for many of the objects in the setting. Young children, (N = 138) ranging in age from 3.3 years old to 5.3 years old, from 8 Head Start classrooms participated in the study. Parent volunteers were recruited for participation in the study. Parents and individual classrooms were assigned to intervention (office play setting) or nonintervention settings. Parents received training on how to interact with their children in play settings. Didactic teaching of letters or numbers was discouraged. Child play behaviors were measured before, during, and after the intervention. Environmental word reading tasks were also

included.

The results of the study indicated that the office play setting improved young children's opportunities to engage in literacy-related behaviors with environmental print. The results also indicated that the office play setting significantly influenced children's environmental word "reading" and that interactive adults (parents) contributed to the learning of print in these contexts. In sum, environmental print learning resulted from interaction with adults who followed children's natural curiosity and allowed children to direct their own learning experience (Neuman & Roskos, 1993).

Conclusions

Based on the summary of seminal research, conclusions can be drawn regarding young children's environmental print awareness. The children who participated in the seminal studies were two to six years of age, enrolled in day care, preschool, or kindergarten, came from a variety of economic and social backgrounds, varying geographic locations, and had no formal reading instruction. It would seem, then, that environmental print awareness develops in all children from literate cultures. However, it is unclear and cannot be determined from existing research (and may never be determined) if this skill develops at a specific age. It is typical, though, for parents to notice this skill sometime after the age of two. Further, while environmental print awareness is an emergent literacy skill that develops in all children, it may actually be very low in the hierarchy of emergent literacy skills. Thus far research has not been able to conclude if or how environmental print awareness is related to later reading skills. Therefore, a child who is not skilled at identifying environmental print will not necessarily have difficulty reading. In that same vein, the ability to "read" environmental print should not be misconstrued as the ability to read.

Conclusions can also be drawn about each of the four questions posed earlier in the purpose of the current study. First, can young children "read" environmental print in context? The seminal evidence indicated that young children are able to identify environmental print in context and, when they make errors, the errors make sense or are relevant to the print, such as saying "soda" when presented with a Coca-Cola logo. Second, can young children read environmental print out of context? Some children are able to read environmental print out of context, but, overall, this proved to be a very difficult task for children and one in which children generally did not perform well. These results make sense in terms of the results from Bialystok and Martin (2003). In their

study, young children had difficulty identifying words in the moving word task because the children viewed the word as a matter of context and not as a symbol from which meaning is taken. Perhaps the explanation for young children's difficulty in identifying logos out of context is the same: young children view the logo as a matter of context and not as a symbol from which meaning is taken. Further, Bialystok, Shenfield, and Codd (2000) noted that, by the time young children begin school, most are able to recognize familiar environmental print words but they may not necessarily understand the symbolic function of the printed words, that is, how print conveys meaning. Third, when young children "read" environmental print are they actually reading or are they reading the graphic cues around the print? When contextual cues were gradually removed or completely removed, children had great difficulty identifying environmental print. This would indicate that, when children identify environmental print "in context," they are actually reading the cues around the print and they view the logo as a matter of context. Lastly, what is the relationship between environmental print awareness and literacy skills in young children? The evidence to date indicated that the relationship or association between environmental print awareness skills and later reading skills is very weak. The ability to identify environmental print does not necessarily lead a child to be able to read words and further research is needed before conclusions can be drawn regarding the relationships between these concepts.

The inherent value in environmental print awareness is that children are coming to understand that print means something and they are making sense of the world around them through their natural curiosity and desire to understand print. While this does not account for young children's symbolic function with regards to print, environmental print awareness may, in fact, be a cognitive attainment. Adults, older siblings, or teachers can enhance a child's understanding of the environmental information in a child's culture by interacting with children using language and literacy activities which will be further described below. As noted by Neuman and Roskos (1993) children may not come about this skill by exposure alone, but rather through positive interactions with adults

Implications for Parents and other Caregivers

Based on the findings in this research summary, there are a number of recommendations for parents and other caregivers regarding environmental print awareness in young children. Parents may begin to notice their young child's curiosity about print when

children ask what something says or how to write a word, such as their own name. Parents can encourage their child's curiosity and learning by following the child's lead and answering questions the child has about print. Parents can take "literacy walks" (Orellana & Hernandez, 1999) with children, pointing out signs and print seen in the community and discussing the colors, pictures, and numbers. Parents can ask their child, "What does this say?" but should not worry if their child is not able to identify the print. Instead, parents can talk about the letters and tell the child what it does say. Parents should not worry about the need to sit down with their young child to "teach" the letters of the alphabet or reading skills. If children show curiosity about letters, parents should follow their lead. Together, parents and children can collect food labels that children recognize and make a game with them, such as matching similar labels. The importance of environmental print is that young children are learning that words mean something and that learning can be enhanced through positive and fun interactions with important adults in their life. Further, Berk (1994) noted that language is crucial in a socially developed mind because it is the primary means of communication and tool for thought. During parent-child dialogues about environmental print, opportunities for the child to engage in discussion and problem-solving allow for learning and understanding of cultural context (Berk, 1994).

References

- American Speech-Language-Hearing Association. (2001). *Roles and responsibilities of speech-language pathologists with respect to reading and writing in children and adolescents (guidelines)*. Rockville, MD: Author.
- Berk, L. E. (1994). Vygotsky's theory: The importance of make-believe play. *Young Children*, 50(1), 30-39.
- Bialystok, E., & Martin, M. M. (2003). Notation to symbol: Development in children's understanding of print. *Journal of Experimental Child Psychology*, 86(3), 223-243.
- Bialystok, E., Shenfield, T., & Codd, J. (2000). Languages, scripts, and the environment: Factors in developing concepts of print. *Developmental Psychology*, 36(1), 66-76.
- Clay, M. M. (1993). *An observation survey of early literacy achievement*. Portsmouth, NH: Heinemann.
- Cloer, T., Aldridge, J., & Dean, R. M. (1981/1982). Examining different levels of print awareness. *Journal of Language Experience*, 4(1&2), 25-33.
- DeLoache, J. S. (2000). Dual representation and young children's use of scale models. *Child Development*, 71(2), 329-338.
- Dickinson, D. K., & Snow, C. E. (1987). Interrelationships among prereading and oral language skills in kindergartners from two social classes. *Early Childhood Research Quarterly*, 2, 1-25.
- Durkin, D. (1993). *Teaching them to read*. Boston, MA: Allyn & Bacon.
- Fingon, J. C. (2005). The words that surround us. *Teaching Pre K-8*, 35(8), 54-55.
- Freire, P. (1970). *Pedagogy of the oppressed*. New York: Seabury Press.
- Ginsburg, H. P., & Oppen, S. (1988). *Piaget's theory of intellectual development* (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.
- Goodall, M. (1984). Can four year olds "read" words in the environment? *Reading Teacher*, 37(6), 478-482.
- Goodman, Y. (1986). Children coming to know literacy. In W. H. Teale & E. Sulzby (Eds.), *Emergent literacy: Writing and reading* (pp. 1-14). Norwood, NJ: Ablex.
- Guttentag, R. E., & Haith, M. M. (1979). A developmental study of automatic word processing in a picture classification task. *Child Development*, 50, 894-896.
- Hiebert, E. H. (1978). Preschool children's understanding of written language. *Child Development*, 49(4), 1231-1234.
- Kirkland, L., Aldridge, J., & Kuby, P. (1991). Environmental print and the kindergarten classroom. *Reading Improvement*, 28(4), 219-222.
- Kuby, P., & Aldridge, J. (2004). The impact of environmental print instruction on early reading ability. *Journal of Instructional Psychology*, 31(2), 106-114.
- Lesiak, J. L. (1997). Research based answers to question about emergent literacy in kindergarten. *Psychology in the Schools*, 34(2), 143-160.
- Lillard, A. S. (1993). Pretend play skills and the child's theory of mind. *Child Development*, 64, 348-371.
- Manning, M. (2004). A world of words. *Teaching Pre K-8*, 34(7), 78-79.
- Masonheimer, P. E., Drum, P. A., & Ehri, L. C. (1984). Does environmental print identification lead children into word reading? *Journal of Reading Behavior*, 16(4), 257-271.
- McGee, L. M. (1986). Young children's

- environmental print reading. *Childhood Education*, 63(2), 118-125.
- Morrow, L. M. (1990). Preparing the classroom environment to promote literacy during play. *Early Childhood Research Quarterly*, 5(4), 537-554.
- 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(1), 95-122.
- Orellana, M. F., & Hernandez, A. (1999). Talking the walk: Children reading urban environmental print. *The Reading Teacher*, 52(6), 612-619.
- Reutzel, D., Oda, L., & Moore, B. (1989). Developing print awareness: The effect of three instructional approaches on kindergartener's print awareness, reading readiness, and word reading. *Journal of Reading Behavior*, 21, 197-217.
- Snow, C. E., Burns, M. S., & Griffin, P. (Eds.). (1998). *Preventing reading difficulties in young children*. Washington, DC: National Academy Press.
- Teale, W. H. (1987). Emergent literacy: Reading and writing development in early childhood. In E. Readance & R. S. Baldwin (Eds.), *Thirty-sixth yearbook of the national reading conference* (pp. 45-74). Rochester, NY: National Reading Council.
- Teale, W. H., & Sulzby, E. (1986). Emergent literacy as a perspective for examining how young children become writers and readers. In W. H. Teale & E. Sulzby (Eds.), *Emergent literacy: Writing and reading* (pp. vii-xxv). Norwood, NJ: Ablex.
- Westwood, P. (2004). Learning to read. In *Reading and learning difficulties: Approaches to teaching and assessment*. London: David Fulton.
- Whitehurst, G. J., & Lonigan, C. J. (1998). Child development and emergent literacy. *Child Development*, 69(3), 848-872.
- Ylisto, I. (1967). *An empirical investigation of early reading responses of young children*. Unpublished doctoral dissertation, University of Michigan.

Acknowledgement

Appreciation is extended to Rebecca Gail Isbell, Ed.D., for her comments and suggestions on an earlier version of the paper. The opinions expressed

in the paper, however, are solely those of the author and do not necessarily reflect those of the reviewer.

Author

Danielle Z. Kassow, Ph.D., is a Research Associate at Talaris Research Institute in Seattle, Washington, email: daniellek@talaris.org.