



Using environmental print to foster emergent literacy in children from a low-SES community



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ABSTRACT

Young children are exposed to environmental print within their communities and this print may be a useful resource to foster emergent literacy skills. This pre-post-test randomised controlled study examined the effects of using environmental print to enhance emergent literacy skills in children aged three to four years ($N = 50$) from a low-SES community in south-east Queensland, Australia. The 8-week (30 min/week) environmental print programme provided multisensory strategies for children to interact with environmental print by identifying letters and words, tracing letters with fingers, and writing letters. ANCOVAs were conducted with pre-test scores as covariates. Children in the environmental print group significantly out-performed the control group on print knowledge, sound knowledge, and print awareness skills. The programme had moderate to large effects sizes and showed that guiding low-SES preschoolers' interactions with environmental print using multisensory strategies is an effective way to foster emergent literacy skills.

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1. Introduction

Preschoolers from low-SES (socioeconomic status) backgrounds are disadvantaged in many developmental domains (Barnett, 1995; McLoyd, 1998), particularly literacy (Raz & Bryant, 1990; Snow, Burns, & Griffin, 1998). Reading and writing are essential skills needed to function in society as reading ability is linked to better social, health, and economic outcomes (Australian Government, 2005; DeWalt, Berkman, Sheridan, Lohr, & Pignone, 2004). Emergent literacy skills, such as alphabet knowledge, print concepts, phonological awareness, and emergent writing, are important precursors of conventional reading and writing (Sénéchal, LeFevre, Smith-Chant, & Colton, 2001; Whitehurst & Lonigan, 1998). These skills emerge from birth through sociocultural experiences (Goodman, 1986) and low-SES preschoolers tend to lag behind their middle- and upper-SES peers in the development of these skills (Duncan & Seymour, 2000; Justice, Chow, Capellini, Flanigan, & Colton, 2003; Korat, 2005; Lynch, 2008).

Foster, Lambert, Abbott-Shim, McCarty, and Franze (2005) reported how low-SES is associated with low emergent literacy ability, with SES (e.g., parental education and occupation) being a

significant predictor of child outcomes. Korat (2005) examined this further by comparing emergent literacy skills (print concepts, letter name knowledge, phonemic awareness, emergent writing, environmental print reading) in kindergarten children from a low-SES ($n = 34$) and a middle SES ($n = 36$) community. Lower SES children performed more poorly on print concepts, phonological awareness, and letter naming than their middle SES peers. Korat (2005) suggested that literacy programmes for low-SES preschoolers should focus on promoting alphabet knowledge, print concepts, and early writing and word reading skills.

Researchers have examined a range of early literacy programmes that are aimed to promote emergent literacy skills in low-SES children (Aram, 2006; Aram & Biron, 2004; Diamond, Gerde, & Powell, 2008; Justice & Ezell, 2002; Wasik, Bond, & Hindman, 2006). Examples include shared story book reading (Whitehurst et al., 1994; $N = 153$ – increased print concepts); print referencing in story books (Justice & Ezell, 2002; $N = 30$ – increased alphabet knowledge, environmental print reading, and word awareness); phonological awareness training (Vadasy & Sanders, 2010; $N = 148$ – increased alphabet knowledge, word reading, and comprehension); joint writing (Aram & Biron, 2004; $N = 71$ – increased alphabet knowledge, phonological awareness, word writing, and orthographic awareness); and enriched play settings (Neuman & Roskos, 1993; $N = 177$ – increased environmental print reading). The overall findings show that storybook reading, joint

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writing, phonological training, and print-rich play activities support different aspects of emergent literacy development in low-SES children.

However, less research has empirically investigated the direct use of *environmental print* to foster emergent literacy skills in low-SES children. Environmental print is a ubiquitous print resource that is freely available across communities, with children from different SES backgrounds having similar exposure to environmental print (Dickinson & Snow, 1987). Examples of environmental print include labels on food products, toys, clothing, and road signs, and this print contains a variety of letters, words, and numerals (Adams, 1990; Horner, 2005; Nutbrown, Hannon, & Morgan, 2005).

Children are exposed to environmental print from birth, and through sociocultural interactions, they begin to make meaning from and understand the functional nature of these signs and labels (Adams, 1990; Harste, Woodward, & Burke, 1984; Teale & Sulzby, 1986). Although pre-reading children decipher environmental print logographically (using logos rather than letter sound analysis skills to decode the print; Frith, 1985; Masonheimer, Drum, & Ehri, 1984), this free resource with its attention-grabbing nature has the potential to support emergent literacy development through adult-guided interactions (Neuman & Roskos, 1993; Neumann, Hood, Ford, & Neumann, 2012; Prior & Gerard, 2004; Vera, 2011; Vukelich, Christie, & Enz, 2008). Adams (1990) argued that if adults focus young children's attention on letters within environmental print, children will learn to examine individual letters, which in turn would support letter learning.

The benefits of guiding preschoolers to focus on letters and words on environmental print items may transfer from school to home and vice versa (Vera, 2011). Furthermore, repeated interaction with environmental print has the potential to consolidate learning. Numerous vignettes have described environmental print use in the preschool setting (Enz, Prior, & Gerard, & Han, 2008; Gerard, 2004; Richgels, Poremba, & McGee, 1996). For example, Enz et al. (2008) described how a preschool teacher used the highly motivating and visually appealing toy label "Pokemon" to assist children's learning of the letter P. They argued that adults play an important role in guiding young children's interactions with environmental print by drawing their attention to the letters and sounds embedded in environmental print words. Parents may also guide their child's interactions with environmental print (Lass, 1982; McGee & Richgels, 1989) using strategies such as pointing out letters and numerals, identifying them, and encouraging their child to trace elements of print on signs and product labels with a finger (Neumann, Hood, & Ford, 2013a; Neumann, Hood, & Neumann, 2009).

Quasi-experimental studies have examined the effects of direct instructional use of environmental print (Prior, 2003; Vera, 2011; Wepner, 1985). For example, Prior (2003) conducted a 12-week intervention ($N = 107$) with preschoolers that examined the effect of using environmental print on letter knowledge and environmental print reading. There were two treatment groups and a control group. One treatment group had direct instruction with environmental print (e.g., pointing out letters in logos, making logo books) and the other had indirect instruction where children played logo games with minimal teacher instruction. The control group was not systematically or intentionally exposed to environmental print. Prior (2003) found that environmental print reading improved in both treatment groups compared to the control group. However, there was no difference between the three groups on letter name or sound knowledge. As letter knowledge was close to ceiling at pre- and post-test, it was difficult to evaluate the effects of using environmental print on letter knowledge. Prior (2003) also described how lower SES children in the sample appeared to respond more enthusiastically to the environmental print programme than higher SES children. Informal feedback from parents

suggested that children were noticing letters in signs in the community, suggesting transference of environmental print interactions from school to home.

Vera (2011) examined the use of environmental print to enhance alphabet knowledge and print concepts during a 9-week preschool intervention ($N = 56$) in a high-poverty suburb. The environmental print group used logos familiar to the children (e.g., movie characters) to learn about alphabet letters whereas the control group used children's names, calendars, and alphabet books. Vera (2011) found that alphabet knowledge and print concepts were significantly higher in the environmental print group than the control group. Although Prior's (2003) and Vera's (2011) findings were promising, they were limited to a small number of emergent literacy measures (i.e., print concepts, alphabet knowledge, and environmental print reading) and there was no random assignment to groups. In addition, the programmes included storybook reading activities so the unique contribution of environmental print on low-SES children's emergent literacy requires further investigation.

A recent preschool intervention ($N = 73$) with 3- to 4-year-olds used environmental print to guide children's interactions with letters (Neumann, Hood, & Ford, 2013b). Assessments were conducted at pre-test, post-test, and at eight-week follow up. Children were randomly placed in an environmental print group, standard print group, or control group. The two treatment groups received the same programme in small instructional groups for 30 min each week for eight weeks, except that the standard print group used the same environmental print words in standard black and white manuscript form on cards. Multisensory activities were incorporated into the programme by encouraging preschoolers to point and look at letters (visual), say the letter's name and sound (auditory), move their hand in the sky in the shape of the letter (kinaesthetic), and trace the letter with a finger (tactile). The environmental print group outperformed the control group on letter sound knowledge, letter writing, environmental print reading, print concepts, and print motivation with most of their gains sustained two months later. The environmental print group performed significantly better than the standard print group on print motivation, environmental print reading, and letter writing. These findings support the use of environmental print as an early literacy intervention tool. However, the study was limited because it examined the program's effectiveness only with children from a mid to high SES community.

2. The present study

Neumann et al.'s (2013b) research was extended by recruiting preschoolers (aged three to four years old) from a low-SES community and randomly allocating them to an environmental print or control group. As Neumann et al.'s (2013b) study already showed that environmental print is beneficial for fostering emergent literacy when compared to a control group the present study did not aim to provide a further test of the specific effects of environmental print. Instead, the present study aimed to validate the use of an environmental print literacy programme in socioeconomically disadvantaged children. The multisensory approach used by Neumann et al. (2013b) was adopted for the present 8-week (30-min session per week) intervention programme. Tactile and kinaesthetic activities such as tracing the outline of letters with fingers has been found to improve visual memory in delayed readers (Hulme, 1981) and enhance letter knowledge and letter writing in young children (Zafrana, Nikoltsov, & Daniilidou, 2000). Children in the present study were pre- and post-tested on emergent literacy measures that have been assessed in previous environmental print interventions (e.g., alphabet knowledge, print concepts, letter writing, environmental print; Neumann et al., 2013b; Prior, 2003; Vera, 2011) and, on the basis of previous findings, these were

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