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The home literacy and numeracy environment in preschool: Cross-domain relations of parent–child practices and child outcomes

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ABSTRACT

There is a growing body of evidence indicating that home literacy and numeracy environments are predictive of children's literacy and numeracy skills within their respective domains. However, there is limited research on the relations between the home literacy environment and numeracy outcomes and between the home numeracy environment and literacy outcomes. Specifically, there is limited information on relations between the home numeracy environment and specific literacy outcomes (e.g., vocabulary). The purpose of the current study was to investigate the relations of the home literacy and numeracy environments to children's literacy and numeracy outcomes both within and across domains. Participants were 114 preschool children and their parents. Children ranged in age from 3.01 to 5.17 years (M = 4.09 years) and were 54% female and 72% Caucasian. Parents reported the frequency of parent–child literacy (code-related practices and storybook reading) and numeracy practices. Children were assessed in the fall and spring of their preschool year on their literacy (definitional vocabulary, phonological awareness, and print knowledge) and numeracy skills. Four mixed-effects regression analyses were conducted to predict each of the child outcomes. Results indicate that although code-related literacy practices and storybook reading were not broadly predictive of children's literacy and numeracy outcomes, the home numeracy environment was predictive of numeracy and definitional vocabulary outcomes. These findings demonstrate a relation between the home numeracy environment

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and children's language development and contribute to the growing body of research indicating the important relations between early numeracy and language development.

Introduction

Children often enter the school setting with considerable individual differences in their academic abilities (Klibanoff, Levine, Huttenlocher, Vasilyeva, & Hedges, 2006; Starkey, Klein, & Wakeley, 2004). One key factor associated with these school-entry ability differences is the home learning environment (Melhuish et al., 2008). What parents do—or do not do—in the home environment to engage their children in learning-based activities is related to the skills and interests that children have when they enter formal academic settings (Fantuzzo et al., 2013; Yeo, Ong, & Ng, 2014). The quality of the early home environment is predictive not only of academic achievement but also of employment later in life (Pungello et al., 2010). Furthermore, the importance of the home learning environment to early academic achievement has been found above and beyond various family-, parent-, and child-level factors, including family income and maternal education (Kohen & Guèvremont, 2014; Yeo et al., 2014).

Although considerable progress has been made during recent years to understand the specific mechanisms by which the home environment affects children's development of early academic skills, these advances have been made primarily in the domain of literacy (e.g., Sonnenschein, Baker, & Serpell, 2010). Less research has been conducted examining children's home numeracy environment. In addition, although it is clear that the domains of early literacy and numeracy develop together and are related to each other (Purpura, Hume, Sims, & Lonigan, 2011; Welsh, Nix, Blair, Bierman, & Nelson, 2010), little research has been conducted to examine connections between preschoolers' home literacy and numeracy environments and the cross-domain relations of these environments to child outcomes (cf. Anders et al., 2012; LeFevre, Polyzoi, Skwarchuk, Fast, & Sowinski, 2010). Thus, the central goal of this study was to assess how the home literacy and numeracy environments predict children's literacy and numeracy outcomes both within and across academic domains during the preschool year.

School readiness domains

Early literacy

Early, or emergent, literacy skills are the foundational skills and knowledge that prereaders need in order to develop the ability to read and write (Roberts, Jurgens, & Burchinal, 2005; Whitehurst & Lonigan, 1998). Three specific literacy components that are related to children's developing reading abilities are print knowledge, oral language, and phonological awareness (Dickinson, McCabe, Anastasopoulos, Peisner-Feinberg, & Poe, 2003). Print knowledge includes conventions of print (e.g., the direction that print is read, the way a book is held), alphabet knowledge, and print recognition (Pullen & Justice, 2003). Oral language includes vocabulary, grammar, and comprehension (Storch & Whitehurst, 2002). Phonological awareness includes detection and manipulation of the parts of language such as words and syllables (Whitehurst & Lonigan, 1998). Many researchers view these early skills as the beginning of a developmental continuum that begins early in life and continues as children enter the school setting (Whitehurst & Lonigan, 1998).

Early numeracy

There are also foundational numeracy skills that children need in order to develop more complex math skills, including: counting/quantification, numerical relations, and arithmetic operations (National Mathematics Advisory Panel., 2008; Purpura & Lonigan, 2013). Counting/quantification includes knowledge of the counting sequence and cardinality, numerical relation skills include the ability to compare sets of quantities, and arithmetic operations include the rules of addition and