



Preschoolers' alphabet learning: Letter name and sound instruction, cognitive processes, and English proficiency[☆]



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ABSTRACT

This study investigated: 1) the influence of alphabet instructional content (letter names, letter sounds, or both) on alphabet learning and engagement of English only and dual language learner (DLL) children, and 2) the relation between children's initial status and growth in three underlying cognitive learning processes (paired-associate, articulation referencing, and orthographic learning) and growth in alphabet learning. Subjects were 83 preschool children in six public preschool classrooms with low-income eligibility thresholds, including 30 DLLs. Children were screened for alphabet knowledge and randomly assigned to small groups and to one of four conditions: experimental letter names or letter sounds only, experimental letter names + sounds (LN + LS), or typical LN + LS. Research assistants provided nine weeks of instruction in each treatment, in 10-min sessions, four days/week. Irrespective of language status, children in the four groups made significant growth from pretest to posttest on measures of alphabet learning. The single-focus letter name or letter sound conditions led to significantly greater growth on taught alphabet content. The experimental LN + LS condition led to greater growth in taught letter names and sounds content compared to the typical LN + LS condition. Pretest vocabulary and alphabet knowledge did not moderate growth, and only limited evidence of differential response to instruction among DLLs was found. Paired associate and articulation referencing learning processes were related to alphabetic growth. Engagement during learning was high in all four treatments. Findings support the benefits of explicit alphabet instruction that enlists cognitive learning processes required for alphabet learning.

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1. Introduction

"It's as simple as ABC." This familiar adage captures the typical perception that children seem to effortlessly learn the associations between individual letter names and letter sounds, and their corresponding written letter. Yet task analyses of letter learning indicate that in actuality learning the alphabet letters is cognitively demanding (Ehri & Roberts, 2006; Foulín, 2005; Nilsen & Bourassa, 2008). Beginners must learn to distinguish non-representational shapes that may be very similar and to associate accurately these

shapes with letter names and letter sounds that may also sound similar to each other.

Early acquisition of alphabet knowledge is important. Knowledge of the alphabet at kindergarten entry is one of the two best predictors of reading and spelling acquisition, including comprehension (Adams, 1990; Ball & Blachman, 1991; Bond & Dykstra, 1967; Chall, 1967; Foulín, 2005; McBride-Chang, 1999; Muter, Hulme, Snowling, & Stevenson, 2004; Piasta, Petscher, & Justice, 2012). Importantly, there is evidence that the relation between children's early alphabet knowledge and later literacy skills is likely causal (Ehri, 1987; Piasta & Wagner, 2010; Roberts, 2003; Treiman & Kessler, 2003). Both accuracy and speed of letter identification are needed (Roberts, Christo, & Shefelbine, 2010). Yet several sources of evidence from both larger- and smaller-scale studies persuasively document that many preschool children are not achieving high levels of alphabetic knowledge as reflected in measures of letter name or sound accuracy.

In the USA, recent evaluations of Head Start (U.S. Department of Health and Human Services, 2005), multi-component preschool

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literacy curricula (PCERC, 2008), and the Early Reading First federal initiative (Gonzalez et al., 2011; Jackson et al., 2007), reveal mixed evidence of alphabet knowledge growth in accuracy. For example, children learned on average five letter names in one year of Head Start. Similarly, the PCERC found that only one of the 15 curricula tested improved children's letter/word performance at preschool. The number of letters (names or sounds) that children have learned, with learning construed as letter accuracy, from alphabetic instruction within individual studies has varied markedly from 4 to 23 or from 18% to 78% of the letters that were taught (Castles, Coltheart, Wilson, Valpied, & Wedgwood, 2009; Diamond, Gerde, & Powell, 2008; Roberts, 2003; U.S. Department of Health and Human Services, 2005).

The nature of the alphabetic content has varied across studies of alphabetic instruction. Letter names (LN), letter sounds (LS), or letter names + letter sounds (LN + LS) have been taught. Preschool teachers are uncertain about and keenly interested in which alphabet content they should teach (O'Leary, Cockburn, Powell, & Diamond, 2010). Scholars and even entire countries have debated the relative merits of teaching letter names and sounds (cf., Ellefson, Treiman, & Kessler, 2009; Levin et al., 2006).

Empirical investigation to determine the relative merits of teaching LN-Only, LS-Only, or LN + LS to preschool-age children becomes even more pressing in the light of two facts. The first fact is that logical and theoretically plausible arguments can be given for the potential benefits of each of the three types of initial alphabet instruction content. The second fact is that there has been very limited research to determine which alphabet content may be most advantageous for gaining early alphabet knowledge.

We reviewed 12 randomized control trials (RCT) and quasi-experimental studies of preschool English alphabet instruction conducted in educational or clinic settings and found that only five investigated alphabet instruction alone, without phonological awareness instruction (see Appendix A). None compared letter name, letter sound, or letter name plus letter sound content within one study or examined both letter knowledge accuracy and speed. None disaggregated data based on whether children first learned English or a non-English language.¹

Another characteristic of these studies is that linkages between instructional design and the cognitive learning processes (CLPs) most involved in learning to identify letters were not detailed. Missing information on instructional details prevented Piasta and Wagner (2010) from analyzing the effectiveness of different instructional routines in their meta-analysis of alphabet instruction. These differences in the extent of alphabetic learning and the apparent limitations in theoretically guided instructional design led us to conclude that alphabet instruction used in previous studies has not fully and consistently capitalized on underlying cognitive learning processes (CLPs) most strongly involved in alphabet learning. This state of affairs particularly merits remedying because small differences in instructional details affect early literacy learning (Byrne & Fielding-Barnsley, 1991; Connor, Morrison, & Slominski, 2006). The CLPs investigated in this study are paired associate learning (PAL), articulation-referencing learning (ARL), and orthographic learning (OL).

In this study we examine the relative merits of teaching letter names, letter sounds, or letter names + letter sounds with respect to speed and accuracy in letter identification and letter writing. We also examine the extent to which instruction that activates and extensively draws upon underlying cognitive learning processes influences learning of letter names and letter sounds, and engagement compared to typical preschool instruction. Finally we

consider how individual differences in cognitive learning processes enlisted in learning letter name/sound correspondences and language status influence alphabetic learning. A mix of DLL and English only (EO) children were included.

To examine these questions preschool-age children were randomly assigned to one of four treatments. Three experimental treatments included different alphabet content (LN-Only, LS-Only, and LN + LS which we refer to as Experimental LN + LS to differentiate it from the fourth treatment) with instructional routines based on paired-associate learning, and the subcomponents of articulation-referencing learning, and orthographic learning. A fourth treatment based on classroom instruction typically used by preschool teachers was a treated control (Typical LN + LS). Measures of alphabet learning (letter name and sound identification, letter naming speed, letter and word spelling) were collected at pretest, midtest, and posttest and related to paired-associate learning, articulation-referencing learning, and orthographic learning competence. Children's engagement during learning was determined with observations of each child multiple times during instruction.

1.1. Optimal content for alphabet instruction: letter names, letter sounds, or letter names + letter sounds?

Below we review theoretical arguments and existing evidence for the benefits of the three types of alphabet instruction content commonly enacted in preschool classrooms and compared in this study. Examining these three types of instruction in one study is a unique feature of the present investigation. This theory and research guides our first research question.

1.1.1. Should we teach letter names?

Young children typically know more letter names than letter sounds, but the source of the discrepancy is not known. U.S. children may have greater exposure to letter names than sounds. Letter names may also be easier to learn than sounds because of the fleeting and less distinctive nature of letter sounds and because letter names provide a whole-word verbal label for letter forms (Boyer & Ehri, 2011; Ehri & Roberts, 2006; Treiman & Kessler, 2003). Letter name instruction may also be advantageous for preschool-age children whose representations of individual English phonemes are still developing, and particularly so for DLLs who are learning the alphabet in a new language. Most letter names contain clues to their sounds (e.g., B-/b/, T-/t/), although a few do not (e.g., "y" and "w") (Treiman, Weatherston, & Berch, 1994; Treiman, Tincoff, Rodriguez, Mouzaki, & Francis, 1998). Consequently preschool letter name instruction may lead to explicit letter name and implicit letter sound knowledge that may become available in phonological awareness, spelling, and word decoding tasks (Cardoso-Martins, Mesquita, & Ehri, 2011; Ehri, 1986).

1.1.2. Should we teach letter sounds?

Knowledge of letter sounds is more directly applicable to literacy skills such as phonological awareness, spelling and word decoding than letter name knowledge, suggesting instruction in letter sounds may be more beneficial to later authentic reading and spelling. The belief that letter sounds should be taught first is held so strongly in the United Kingdom that since 2007 their National Literacy Strategy stipulates that all children will first be taught letter sounds and synthetic phonics beginning at ages 4–5 (Department for Education, 2014; Rose, 2006). Concern has also been voiced that sounds may be preferred over names because letter names may actually introduce confusion to initial decoding and spelling because letter names map less well to sounds in words than do letter sounds. In contrast, letter sound instruction may be particularly challenging for preschool DLL children whose mental representations of English phonemes are emerging or for those who

¹ A child whose first language is not English is referred to as a dual language learner (DLL).

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