Evidence Brief
Tutoring Buddy Letter Sounds

Tutoring Buddy Letter Sounds is a computer program that can be used by interventionists to teach young children letter sounds using incremental rehearsal (IR; Tucker, 1989). The literature on incremental rehearsal has supported its effectiveness in promoting mastery/acquisition (e.g., Bunn, Burns, Hoffman, & Newman, 2005), fluency (e.g., Burns, 2005), retention (e.g., MacQuarrie-Klender, Tucker, Burns, & Hartman, 2002), and generalization (Nist & Joseph, 2008). Incremental rehearsal has been found effective across a range of literacy skills including letter sound knowledge (Volpe, Burns, DuBois, & Zaslofsky, 2011; DuBois, Volpe, & Hemphill, 2014), letter naming (Bunn et al., 2005), sight-word knowledge (Szadokierski & Burns 2008), with associated gains in reading fluency (Burns, Deans, & Foley, 2004), and reading comprehension (Burns, et al., 2004). In addition the effectiveness of incremental rehearsal has been documented across a wide age range and for typically developing and affected students (Bunn et al., 2005; Burns, 2005; Matchett & Burns, 2009; Peterson et al., 2014) including students with intellectual disabilities (Burns, 2007).

Theoretical Basis

Learning to read in an alphabetic system requires an understanding that units of text map onto specific units of speech, not units of meaning (Perfetti, 1984). Children must learn that each letter of the alphabet is associated with a meaningless unit of speech (a phoneme). When children are able to fluently link each letter of the alphabet to an individual phoneme, they develop the capacity to decode and read unfamiliar words, which increases opportunities to practice reading (Adams, 1990) and makes reading a productive activity. The sequential relationship between alphabetic skills and word reading is addressed in Ehri's four-phase model of sight-word development (Ehri, 2005). In this model, all children begin in a pre-alphabetic phase in which they lack awareness of phoneme-grapheme relationships and often guess what words are on the basis of physical features (e.g., a popular brand logo) or context (i.e., logographic reading). In the partial-alphabetic phase, children acquire knowledge of grapheme-phoneme correspondences. With repeated exposure to grapheme-phoneme relationships, children enter a full alphabetic phase in which they begin applying this knowledge fluently and accurately to text. In the concluding phase (consolidated alphabetic), children are able to exercise their skills to decode and articulate unfamiliar words. Therefore, knowledge of letter sounds can be conceptualized as a skill that provides the foundation for activities that involve decoding and reading.

Incremental rehearsal is a method for teaching fact-based knowledge. The mechanism of IR's efficacy likely rests in the incorporation of components that facilitate the transfer of newly presented information from short-term memory to long-term memory. Incremental rehearsal affords a high number of opportunities to respond (Bums, 2007; Volpe, Mulé, Briesch, Joseph, & Bums, 2011), which has been shown repeatedly to enhance acquisition and retention (Greenwood, Delquadri, & Hall, 1984; MacQuarrie, Tucker, Bums, & Hartman, 2002). IR also features distributed practice (Dempster, 1991), training to automaticity (Jones & Christensen, 1999), and errorless learning (Browder & Shear, 1996).

Incremental rehearsal procedures traditionally require interventionists to present

information on flashcards in a specific sequence, which can be time intensive. Tutoring Buddy Letter Sounds was developed to reduce the time and training required to implement incremental rehearsal and to automate cumbersome tasks (arranging and manipulating cards, recording responses, data management and progress monitoring).

Empirical Support

The first evaluation of Tutoring Buddy Letter Sounds employed a multiple-baseline-across-participants design. Volpe and colleagues (2011) investigated the effects of the program as delivered by first-year graduate students on four kindergarten students who were non-responsive to an evidence-based secondary reading intervention. The program had a significant and positive impact on letter sound fluency (ES = 2.87 across the four participants). Treatment fidelity across sessions was 99.9% (range 97 – 100%). These initial data provided evidence that Tutoring Buddy is a highly effective intervention.

DuBois et al. (2014) conducted a randomized control trial to replicate and extend these findings. Participants in this study were 30 kindergarten and first-grade students who were identified by their classroom teachers as struggling readers. Students were randomly assigned to a 2-week intervention or waitlist control condition. Graduate students again served as interventionists. In addition to measuring letter sound knowledge and letter sound fluency, the impact on decoding skills was also measured (i.e., nonsense word fluency). Rates of growth for letter sound knowledge (LSK), letter sound fluency (LSF), and nonsense word fluency (NWF), as well as level of performance for each measure 1 week post treatment, were significantly higher for the treatment group as compared to the control group. On average, students in the treatment condition learned 6.6 letter sounds during the course of the intervention (range, 4-10). Effect sizes were in the medium range: 0.53, 0.59, and 0.67 for LSE, NWF, and LSF, respectively.

Most recently DuBois, Volpe, Burns, & Hoffman (2015) employed a multiple-baseline-across-participants design to study the efficacy of caregiver implementation of Tutoring Buddy Letter Sounds. Participants were three 4-year-old students and their parents. Parents administered the intervention on an iPad over 6-weeks. Results indicated that the intervention was effective for all three students. Effect sizes ranged from .83 to 1.0.

Summary

Based on a strong theoretical foundation and several well-designed experimental studies, Tutoring Buddy Letter Sounds is a strong method to support the literacy development of at-risk students. Given that the tool automates data collection, and tracks student progress, it is highly efficient and useable.

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