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Using a Response-to-Intervention Approach in Preschool to Promote Literacy

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A response-to-intervention model (RTI) has been identified as a promising way to identify and intervene early with children who are experiencing learning difficulties. The general RTI approach also holds promise of preventing learning difficulties with preschoolers. This article examines the potential benefits of implementing a RTI model in preschool settings as well as the feasibility of implementation with respect to current preschool assessment technologies, teacher preparation, and program philosophical orientations. Although the research supporting the efficacy of systematic early literacy interventions in reducing pervasive reading problems is convincing, it is concluded that current preschool programs have not embraced these findings into everyday practice. Implications for school psychologists serving young children are addressed.

Key Words: RTI, Preschool, Literacy, Early Identification

Learning to read is the foundation for children's success both in and outside of the classroom, yet reading problems persist among America's children. The National Assessment of Educational Progress (NAEP, 2003) estimates that only 31% of fourth graders are reading at a proficient level. Moreover, NAEP results show that the poorest readers are reading even lower than previous assessments, whereas higher-performing readers have made gains in reading. In a study looking at the persistence of poor reading skills, Cunningham and Stanovich (1997) found that first grade reading skills were a strong predictor of how a child will be reading in 3rd, 5th, and 11th grades. These studies, along with many others (Baydar, Brooks-Gunn, & Furstenberg, 1993; Dickenson & Sprague, 2001; Juel, 1988; Scarborough, 2001; Shaywitz, Escobar, Shaywitz, Fletcher, & Makuch, 1992), suggest that the acquisition of literacy skills follows a developmental trajectory that is stable over time, both for advanced and delayed readers.

Although the outlook for children struggling to learn to read is bleak, one way of improving outcomes is to identify and intervene with young children to ensure they have mastered essential early literacy skills prior to beginning formal reading instruction. Convergent research evidence now shows that the acquisition of important pre-literacy skills, such as phonological awareness, directly affects the ease of reading acquisition and subsequent reading achievement (National Reading Panel, 2000; Simmons & Kaméenui, 1998; Whitehurst & Lonigan, 2001). More importantly, these skills can be reliably measured, successfully taught, and systematically monitored in young children before they enter kindergarten; thus, decreasing the prevalence of children experiencing reading difficulties in school. The purpose of this article is to describe available research literature examining response-to-intervention (RTI) approaches in education, and propose a RTI model for implementation in early childhood settings that focuses on early identification and intervention of preschool-age children at-risk for reading difficulties. Early literacy data collection methods and intervention models appropriate for preschool settings will be described as well as the benefits and challenges of implementing a RTI model in early childhood settings. Additionally, implications for school psychologists providing early intervention services will be discussed.

RTI DEFINED

In response to the President's Commission on Excellence in Special Education (2002) and the reauthorization of the Individuals with Disabilities Education Improvement Act (IDEIA, 2004; PL-108-446), there is growing interest in RTI approaches for remediating learning problems and making decisions regarding eligibility and services for special education, specifically identifying children with learning disabilities (LD). Although no single model defines a RTI approach, it generally includes the following core elements: (a) implementing research-based instruction; (b) monitoring student progress using socially important outcome measures; and (c) modifying instruction, if needed, based on student progress and need (Fuchs, Mock, Morgan, & Young, 2003). The need for instructional modifications and/or additional services is based on the child's failure to make adequate progress. This approach was initially conceptualized by Heller, Holtzman, and Messick (1982) as a means of identifying students with LD, and was further elaborated by Fuchs and Fuchs (1998) and Speece and Case (2001). Currently, several school districts around the country are utilizing a RTI service delivery approach as a way to meet the needs of diverse learners and have reported positive results in decreasing rates of referrals to special education (Ikeda, Tilly, Stumme, Volmer, & Allison, 1996; Kovaleski, Gickling, Morrow, & Swank, 1999; Telzrow, McNamara, & Hollinger, 2000), and decreasing disproportionate representation of minorities in special education (Marston, Muyskens, Lau, & Canter, 2003). Unfortunately, little, if any, research is available demonstrating RTI models in early childhood settings. Implementing an early literacy RTI approach in preschool has the potential to significantly decrease the number of children who are experiencing reading difficulties and increase the number of students who receive timely early intervention in literacy.

RTI: Data Collection

Implementing a RTI approach necessitates the inclusion of several critical elements for making decisions regarding student needs. First, data regarding children's basic skills are needed to determine who is in need of intervention. A second consideration is determining the content and intensity of what will be taught. Third, data are needed to determine the effectiveness of the intervention in meeting the child's instructional needs. Thus, data collection instruments must meet a wide-variety of purposes to be considered for use in a RTI model. In a recent report by the U.S. Office of Special Education Programs, National Center on Student Progress Monitoring (2005), seven standards of technical adequacy critical to evidence-based student progress monitoring were identified: (a) availability of alternate forms; (b) specification of rates of improvement; (c) specification of benchmarks and/or goal setting; (d) sensitive to small increments in learning; (e) leads to improvement in teacher planning and student learning; (f) established reliability; and (g) validity.

Two of the most commonly cited and empirically-validated progress monitoring measurement systems used in a RTI model are Curriculum-Based Measurement (CBM; Shinn, 1989) and Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 1996). Both measurement systems meet most, if not all, criteria stated above. Specifically, CBM tasks have established technical adequacy and are considered reliable and valid indicators of reading, writing, math, and spelling for children in first through eighth grades (Marston, 1989). Alternate forms are available to facilitate progress monitoring (Shinn, 1989), and goal setting guidelines and instructional placement standards are established (Fuchs, 1998; Fuchs & Deno, 1982). Additionally, research shows that utilizing CBM procedures enhance the quality of instruction and achievement of students receiving specialized services (Fuchs, Fuchs, & Hamlett, 1990). Similarly, DIBELS tasks, specifically Initial Sound Fluency (ISF), Phonemic Segmentation Fluency (PSF), and Nonsense Word Fluency (NWF), have been estab-

lished as technically adequate measures of early literacy skills for children in kindergarten through first grade. These tasks also include alternate forms, are sensitive to learning over short periods of time, and have specified benchmarks for determining adequate performance. Although both measurement systems are appropriate for use in RTI models, CBM and DIBELS tasks have not been established as useful or appropriate for measuring preschool literacy skills, nor have the psychometric properties been validated with preschool-age children.

The technology for implementing a successful RTI model for preschool-age children to improve reading outcomes is in the early stages of development. A workgroup at the University of Minnesota recently developed a series of early literacy and language indicators for preschool-age children. Of the approximately 10 measures developed as potential tools for identifying children in need of intervention and evaluating the effectiveness of interventions, three tasks best meet the measurement requirements put forth by the National Center for Student Progress Monitoring: Picture Naming, Rhyming, and Alliteration. Preliminary research indicates that these measures hold promise for implementing a response-to-intervention approach with preschoolers to improve literacy outcomes.

The Picture Naming (PN) task is a measure of a child's expressive language development. On this task, the child is presented a series of color pictures of objects found in common settings (e.g., home, classroom, and community) and told to name the pictures as quickly as possible. The number of pictures named correctly in one minute is the child's score. A total of 120 color pictures are available. The alternate-form reliability over one-month for this task ranges from .44 to .78 (McConnell, Priest, Davis, & McEvoy, 2002). Test-retest reliability of the PN task across three weeks is .67 (Missall & McConnell, 2004). The criterion-related validity of the PN task with the Peabody Picture Vocabulary Test –Third Edition (PPVT-3) is .56 to .75, and .63 to .79 with the Preschool Language Scale-3. When compared to preschooler's performance on the DIBELS tasks, the PN task correlated .32 to .37 with Letter Naming Fluency, and .44 to .49 with Initial Sound Fluency (McConnell et al., 2002). Construct validity of the PN task is evident by significant correlations between children's scores and chronological age ($r = .41$ and $r = .60$), and the differential performance of typically developing children ($r = .63$), children attending Head Start ($r = .32$), and children receiving early childhood special education services ($r = .48$; McConnell et al., 2002). Additionally, studies show the PN task to be sensitive to small changes in the development of preschoolers' expressive language skills (Missall & McConnell, 2004).

The Rhyming task is a measure of a child's developing phonological awareness skills. On this task, the child is presented with a series of cards. Each card includes four pictures: a picture at the top of the card (i.e., stimulus word), and three pictures below. The examiner points and names each picture and tells the child to point to one of three pictures that sounds the same as the top picture (Missall & McConnell, 2004). The number of correctly identified pictures in two minutes is the child's score. Fifty-four stimulus cards that can be randomly sampled for administration are available for this task. Test-retest reliability on the Rhyming task ranges from .83 to .89 over three weeks (Missall & McConnell, 2004). Criterion-related validity of the Rhyming task was established with the PPVT-3 ($r = .56$ to .62); Concepts About Print (CAP; $r = .54$ to .64); and the Test of Phonological Awareness (TOPA; $r = .44$ to .62; Missall & McConnell, 2004). Moderate to high correlations were found with the PN task ($r = .46$ to .63), and Alliteration task ($r = .43$), and the DIBELS' Letter Naming Fluency ($r = .48$ to .59), and Initial Sound Fluency ($r = .44$ to .68; McConnell et al., 2002; Missall & McConnell, 2004). This measure also is sensitive to small changes in learning with significant positive correlations found between children's performance on the Rhyming task and age. Performance differences also were found between typically developing children and children with identified disabilities, children from low-income homes, children with speech and language disabilities, and English Language Learners (Missall & McConnell, 2004).

Like the Rhyming task, the Alliteration task is a measure of a child's beginning phonological awareness skills. Similarly, the examiner presents a series of stimulus cards to the child that depicts four pictures: one at the top (i.e., stimulus word) and three pictures below. The examiner points and names each picture and tells the child to find the picture with the same initial sound as the stimulus word. The number of correctly identified pictures in two minutes is the child's score. A total of 46 stimulus cards are available for this task that can be randomly selected for administration. Test-retest reliability for this task over three weeks is .46 to .80. Criterion-related validity was established with the PPVT-3 ($r = .40$ to $.57$), the TOPA ($r = .75$ to $.79$), the CAP ($r = .34$ to $.55$) and the DIBELS' Letter Naming Fluency ($r = .39$ to $.71$; McConnell et al., 2002). Construct validity evidence includes positive correlations between performance on the Alliteration task and age, and differentiated performance on this task between typically developing children and children with disabilities, and children from low-income backgrounds and English Language Learners (Missall & McConnell, 2004).

Based on the criteria established by the National Center on Student Progress Monitoring (2005), the PN, Rhyming, and Alliteration measures meet two of the seven technical adequacy standards recommended for progress monitoring: availability of alternate forms and sensitivity to small increments in learning. Currently, empirical evidence is not yet available regarding (a) children's typical rates of progress, (b) guidelines for goal setting and benchmarks, and (c) improvement in teacher planning and subsequent student achievement. Although the current psychometric characteristics of these measures are promising, more data are needed to establish acceptable reliability and validity estimates, as well as document improved teacher-effectiveness from using these measures. However, merely demonstrating the technical adequacy of RTI data collection tools is insufficient for implementing RTI procedures in educational settings. As illustrated by Fuchs (2003), to make informed decisions regarding student responsiveness to intervention, further research is needed to establish the optimal timing of measurement (e.g., weekly, pre- and post-intervention growth, and post-intervention status), determining the criterion for deciding responsiveness (e.g., slope, level, and/or dual discrepancy), and clarifying a norm-group or benchmark to compare post-intervention performance.

RTI: Intervention Models

Aside from the provision of evidenced-based intervention combined with data collection to inform instructional decision-making, there are no conceptual or procedural standards that define intervention in an RTI model. However, two RTI intervention models have surfaced in the research literature as the most common approaches to providing intervention: problem-solving and standard-protocol (Fuchs et al., 2003; Vaughn & Fuchs, 2003). Although each model serves to provide effective, intensive, and individualized instruction to struggling learners, the methodology each approach uses is significantly different.

Problem-solving is possibly the most commonly implemented RTI intervention approach utilized in the field of school psychology. Based on Kratochwill and Bergan's (1990) behavioral consultation model, problem-solving embodies a set of specified, sequenced decisions based on the assumption that interventions represent testable hypotheses that must be evaluated for each student. Thus, no intervention can be determined to be successful with a student before its implementation despite the empirical evidence of its effectiveness. The delivery of problem-solving intervention models has assumed a wide-variety of labels: pre-referral intervention teams, mainstream assistance teams, teacher assistance teams, intervention based assessment, building assistance teams, and instructional support teams (Conway & Kovaleski, 1998; Fuchs, 2003; Fuchs, Fuchs, & Bahr, 1990; Ikeda et al., 1996; Telezrow et al., 2000). Despite the difference in name, problem-solving is delivered via a four-step process to identifying student needs and determining responsiveness to intervention: problem identification, prob-

lem analysis, exploring solutions, and evaluating solutions. Through each step in the model, a student's individual instructional needs are determined based on the collection of pre-intervention data, individualized instruction is provided based on student skill deficits, and continuous data are collected to guide instructional planning. It is only after a student has progressed through these steps, possibly more than once, and has not responded adequately to effective instruction that inferences regarding the presence of a disability and need for sustained, structured and individualized instruction outside the general education setting (e.g., special education) are considered.

The second approach to intervention in an RTI model is the standard protocol. Instead of individually-designed interventions that are developed and modified in response to individual student needs, the standard protocol approach is characteristic of a brief, intensive, small-group intervention provided to students who exhibit similar skill deficits in an academic domain (Fuchs et al., 2003). Thus, a generally effective intervention program is provided to a generally homogenous group of students for a specified amount of time. At the end of the intervention phase, students are categorized as "responders" or "non-responders" and subsequently, inferences regarding non-responsiveness generally lead to the conclusion that those students possess underlying skill deficits that can't be explained by poor instruction. Although less research has been conducted on this approach and thus, less is known about the function of data collection in informing instruction, the standard protocol approach remains promising for schools and districts that do not have the expertise or resources to conduct individual problem-solving cases. At the same time, the assumption that "non-responsiveness" is indicative of an underlying disability may be erroneous.

RTI: IMPLEMENTATION IN PRESCHOOL SETTINGS

Consistent with early intervention models, a preschool RTI approach would assume a proactive preventative model of promoting the timely acquisition of key emergent literacy skills, such as phonological awareness and alphabet principle knowledge, while decreasing the risk of developing learning difficulties. While literacy activities in preschool are typically characterized as implicit, informal, and naturalistic interactions with literacy-related materials and activities, young learners from diverse backgrounds require a more explicit, efficient, and expedient approach to intervention (Justice, Chow, Capellini, Flanigan, & Colton, 2003). In this vein, a standard protocol RTI approach to teaching emergent literacy skills may best suit the needs of preschool children in the earliest stages of acquiring important pre-academic skills. A protocol of carefully constructed activities and structured tasks designed to overtly and systematically promote literacy performance is proposed for inclusion in preschool classrooms. Utilizing this approach, a set series of activities in a specific area or domain for a particular amount of time each day or week would be prescribed. Data collection efforts and results dictate the intensity, structure, and grouping of the intervention as it relates to what should be taught, how, for how long, with whom, and by whom. As ongoing (e.g., weekly or bi-weekly) data are collected, the form, structure, content, and grouping of instruction may change based on the needs of individual students. Once children's responsiveness to intervention is determined (e.g., level, slope, and/or dual discrepancy), the provision of instructional resources is allocated based on need, with children with the lowest amount of responsiveness receiving continued, intensive intervention.

Benefits to Implementation in Preschools

The potential promise of implementing a RTI approach in preschool settings for the prevention of short- and long-term learning difficulties is considerable. Aside from the large body of knowledge documenting the effectiveness of early intervention, especially for individuals from economically impoverished backgrounds (Bowey, 1995; Lonigan et al., 1999; Raz & Bryant, 1990), convergent re-

search strongly suggests that the provision of preschool emergent literacy instruction is a seemingly powerful vehicle for reducing the risk of later reading problems (Adams, 1990; Lundberg, Frost, & Petersen, 1988; Snow, Burns, & Griffin, 1998; Whitehurst et al., 1999). This is especially notable given the stability of individual reading differences in the early elementary years.

Challenges to Implementation in Preschools

Unfortunately, few preschool programs, especially programs serving children from disadvantaged backgrounds who are the most at-risk for developing reading problems, have realized their full potential in preventing reading problems (Barnett, 2004). Several explanations are offered as to why programs serving young children have not utilized data-based decision making models such as RTI to increase academic outcomes for young children, including (a) the focus of preschool curricula and instruction, (b) the adequacy of assessment, and (c) early childhood teacher training and professional development.

Preschool programs, especially those serving children from disadvantaged backgrounds such as Head Start, have been accused of providing few activities that promote emergent skills in literacy, and focusing rather on music, arts and crafts, and physical activities (National Academy of Sciences, 2003). For example, Burchinal et al. (2000) reported that preschool classrooms lack exposure and opportunity to engage in language and literacy activities. More recently, a study conducted by McGill-Franzen, Lanford, and Adams (2002) found that preschools serving children from low-income homes tend to adopt curricula and pedagogical approaches that endorse a narrow view of learning outcomes by providing preschoolers with little access to print, few opportunities to participate in literacy, and little experience listening to or discussing relevant literature. In a study investigating preschool teacher beliefs concerning the importance of teaching a variety of developmental skills, teachers rated social-emotional skills significantly higher than language, literacy, and early math skills (Kowalski, Pretti-Fronczak, & Johnson, 2001). Moreover, skills most closely associated with academic content received the lowest ratings. Dickinson (2001) reported a negative relationship between preschool teacher endorsements of social-emotional skills and their students' performance on early literacy indicators.

The relatively low importance preschool teachers place on including pre-academic content and activities in the classroom ignores an extensive body of research identifying classroom features, materials, instructional content, teacher behavior, and classroom activities that support and extend children's growing literacy and mathematics skills. The long-heated debate by developmentally appropriate practice enthusiasts and direct instruction advocates should be reconsidered within the seminal findings by the National Reading Panel (2000) and National Academy of Sciences (2003) that note the benefits of early childhood direct instruction on increasing academic outcomes for young children with no evidence of deleterious effects on children's motivation and independence in learning. Research supporting the efficacy of child-centered, explicit-embedded instruction in the acquisition of academic skills that seemingly do not compromise children's self-confidence and intrinsic motivation to learn may have influenced the most recent position statement from the National Association for the Education of Young Children on developmentally appropriate practice (Bredekamp & Copple, 1997). This policy statement indicates a shift from exploratory learning toward providing preschoolers direct instruction and opportunities to develop print awareness, learn letter names and letter-sound correspondences, build language skills, and experiment with writing. In many preschool programs, especially those serving children from low socioeconomic backgrounds, however, the incorporation of pre-academic content has yet to be realized.

Commonly, early childhood educators do not receive adequate pre-service training or subsequent

professional development in functional assessment and intervention models to effectively and efficiently identify young children needing intervention and the skills that need to be taught. An executive summary written by the National Academy of Sciences (2003) on educating preschoolers concluded that few early childhood teachers are trained on the usefulness and purposes of traditional standardized assessments and thus, misuse is rampant. In another study examining teachers' use of assessment and curricula, most teachers reported using a wide-variety of assessment measures. However, they commonly cited measures that were inadequate for linking assessment to intervention, with many teachers reporting use of self-developed and/or program-developed measures of unknown reliability and validity (Pretti-Frontczak, Kowalski, & Brown, 2002). When asked about curriculum practices, over half of the teacher responses did not meet the definition of an actual curriculum. Thus, preschool teachers' current assessment and curricular practices may not meet professional standards that actually promote the growth and development of young children's pre-academic skills.

IMPLICATIONS FOR SCHOOL PSYCHOLOGISTS

Much has been written in the past decade on the call for school psychologists to work as early interventionists (Barnett, 2002; National Association of School Psychologists, 1997). This seems warranted given the fact that most states awarding credentials in school psychology endorse practitioners to work with youth ages 3-22 (California Commission on Teacher Credentialing, 2004). Additionally, most training programs in school psychology place a significant emphasis on preparing school psychologists as problem solvers and significant members of school teams (Gutkin & Curtis, 1999), skills necessary for implementing a successful RTI agenda. However, with the passage of the Individuals with Disabilities Education Improvement Act of 2004 (PL-108-446) and the increased focus on preventing learning problems and intervening early with struggling learners, school psychology training programs will need to emphasize assessment models that inform intervention, while deemphasizing deficit-focused assessment. Moreover, school psychology practitioners will likely assume a more significant role in establishing partnerships with parents, strengthening home-school collaboration, and utilizing an ecological approach to the identification and prevention of problems in a variety of educational settings.

Currently, an initiative slated to be on the June 2006 ballot will, if approved, make preschool available for all of California's preschoolers. The initiative calls for state and local policy and action to guide preschools toward preparing three- and four-year-olds for kindergarten by developing preschool content standards, providing continual quality professional development to preschool teachers, and developing and implementing an accountability system (California Department of Education, 2005). Additionally, the California Department of Education is advocating the development and utilization of preschool performance monitoring instruments to measure children's developing early literacy, language, and math skills on an ongoing basis. It is proposed that these progress monitoring instruments directly assess children's academic skills so that preschool teachers can modify instruction to fit the needs of their children. In this vein, school psychologists can play a major role in working with preschool programs in selecting progress monitoring measures that meet the standards set forth by the National Center on Student Progress Monitoring (2005). Furthermore, school psychologists can be instrumental in training preschool teachers on the administration, scoring, and interpretation of assessment data to identify at-risk children and link assessment data to instruction. With the mandate to implement a preschool accountability system, school psychologists can be instrumental in collaborating with preschool directors and teachers to ensure all preschoolers are equipped with the necessary skills to meet the demands of an increasingly academically oriented kindergarten.

CONCLUSIONS AND FUTURE DIRECTIONS

Although research has yet to be conducted on implementing a RTI model in preschool settings, much of the risk of replacing the current IQ-achievement discrepancy model with a RTI approach to identifying LD is not relevant for implementation in preschool settings because the negative ramifications of falsely identifying preschoolers for inclusion in intervention is low (Kaminski & Good, 1998). That is, adhering to a high standard for assessment and intervention procedures to indicate the presence of LD as a function of inadequate response to instruction may not be as important as utilizing measurement tools that indicate who may be at-risk of developing reading difficulties, the focus of instruction, and when interventions have reduced the risk of reading problems. The focus on prevention instead of remediation in a preschool RTI model affords the use of assessment instruments with a less rigorous standard of reliability and validity because the cost of a decision error is relatively low. If a child were mistakenly provided with additional intervention, as opposed to labeled with a disability and placed in a special education program, negative consequences would be minimal. For young children who indeed have an unidentified disability, a preschool RTI perspective can serve as a model for identifying young children with a disability who may need sustained, structured and individualized instruction outside the general education setting.

Nonetheless, implementation of a RTI model in preschool necessitates the empirical investigation of the utility, feasibility, and value of RTI with preschoolers. Thus, many of the same unknowns of implementing RTI in K-12 settings are applicable to early childhood settings. Specifically, additional research is needed to compare the effectiveness and viability of a standard protocol and problem-solving approach to examine the fidelity of implementing a RTI model by teachers and/or paraprofessionals who may have little knowledge of functional assessment practices and data-based decisions; to analyze the costs of implementation in relation to the benefits; and to examine teachers' acceptability of RTI procedures and outcomes.

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