The Conditions of Beginning Reading Instruction for Students With Autism Spectrum Disorder

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Abstract

A disproportionate number of students with autism spectrum disorder (ASD) are below grade level in reading. This trend may be due in part to characteristics of the disability, but it may also reflect lack of access to the instructional conditions needed for success in beginning reading. In this study, we surveyed special education teachers to investigate the conditions of reading instruction for K-3 students with ASD. Consistent with recommendations regarding beginning reading, teachers ($n = 66$) indicated that the vast majority of students with ASD ($n = 226$) participated in daily reading instruction and received more comprehensive instruction than the sight word approach that has been used in the past. Findings of concern included frequency of use of paraprofessionals to provide primary instruction, teachers' relatively low self-efficacy for teaching reading to students with ASD, and provision of less than the recommended instructional time for K-3 reading.

Prior research has confirmed the critical role that instruction plays in the development of reading. Without adequate beginning reading instruction, students who lag behind their peers in first grade are apt to remain behind throughout their school careers and into adulthood (Snow, Burns, & Griffin, 1998). Although several studies have documented strengths in word recognition for some students with autism spectrum disorder (ASD; for example, Newman et al., 2007), most investigators have concluded that a disproportionate number of students with ASD do not meet grade-level expectations in word recognition or comprehension (Asberg, Dahlgren, & Sandberg, 2008; Brown, Oram-Cardy, & Johnson, 2013; Estes, Rivera, Bryan, Cali, & Dawson, 2011; Huemer & Mann, 2010; Nation, Clarke, Wright, & Williams, 2006; Norbury & Nation, 2011; Ricketts, Jones, Happé, & Charman, 2013).

The trend toward low reading achievement may be linked in part to cognitive, behavioral, and verbal limitations associated with ASD (e.g., Mayes & Calhoun, 2003; Nation & Norbury, 2005; Williamson, Carnahan, & Jacobs, 2012); however, it may also reflect insufficient access to the instructional conditions that are essential to success in beginning reading. Several reports have described the exclusion of some students with ASD from comprehensive literacy programs, an instructional overemphasis for other students on narrow skills such as sight-word knowledge, and lack of systematic instruction in key components such as comprehension (Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozzine, 2006; Kliewer & Biklen, 2001; Mirenda, 2003; Whalon & Hart, 2011).

Within the broader literature on literacy acquisition, three instructional conditions have been identified as essential to beginning reading success, especially for students at risk for reading difficulties. First, students should receive instruction from teachers who have the greatest preparation and knowledge to assume that responsibility (Braunger & Lewis, 2006; Snow, Griffin, & Burns, 2005). In recent years, a growing body of research has confirmed a link between what teachers know about reading and the reading achievement gains of their students (McCutchen et al., 2002; McCutchen, Green, Abbott, & Sanders, 2009; Piasta, Connor, Fishman, & Morrison, 2009; Podhajski, Mather, Nathan, & Sammons, 2009). Teaching reading is rocket science (Moats, 1999), and those charged with that responsibility must have "deep knowledge of what they are teaching, knowledge of the student's history, routines, dispositions, and inquiry skills to alter instruction when an approach is not working" (Pearson, 2003, p. 15).

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In addition, teachers responsible for reading instruction should have confidence in their own abilities to influence student achievement, also known as efficacy for teaching (Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998). Previous research has established an association between teachers' self-perceptions of competence and student gains in reading (e.g., Ashton & Webb, 1986; Guo, Piasta, Justice, & Kaderavek, 2010). Other investigators have documented a relationship between self-efficacy and teacher behavior. For example, teachers with stronger versus weaker efficacy for teaching tend to work longer with students who are experiencing difficulties (Gibson & Dembo, 1984), to be more planful and organized (Allinder, 1994), to set higher end-of-the-year goals for their students (Allinder, 1995), and to express more willingness to try new methods (Berman, McLaughlin, Bass, Pauly, & Zellman, 1977; Guskey, 1988).

A second condition relates to instructional time and intensity. Beginning readers should be engaged in instruction for a sufficient amount of time to support progress. A common recommendation for K-3 programs is a dedicated instructional block of 90 to 120 min for all students (Allington, 2009; Foorman & Connor, 2010). In addition, students who are reading below grade level should receive more intensive instruction than other students (Allington, 2009, 2013; Griffiths & Stuart, 2013; Vaughn, Denton, & Fletcher, 2010). Instructional intensity may be enhanced by increasing instructional time and reducing group size (e.g., Mellard, McKnight, & Jordan, 2010; Vaughn et al., 2010).

Third, beginning instruction should be comprehensive, addressing all essential components of reading (Foorman & Connor, 2010; National Institute of Child Health and Human Development, 2000; No Child Left Behind Act, 2001). Prior investigations of classroom reading programs have revealed considerable variation in scope, ranging from exclusive focus on alphabetics (e.g., phonemic awareness, phonics) to exclusive focus on vocabulary and comprehension (e.g., Vaughn, Moody, & Schumm, 1998). Considerable consensus now exists that beginning readers should have access to instruction on ALL components, including phonological awareness, phonics, fluency, vocabulary, and comprehension. Indeed, the Common Core State Standards for Grades K-3 specify grade-by-grade accomplishments in each of these areas (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010).

Little is currently known about the implementation of the above conditions in reading instruction for students with ASD. With respect to teacher expertise, we were unable to locate any studies that identified the personnel who deliver reading instruction to students with ASD, their qualifications to assume that responsibility, or their self-perceptions of competence. The use of paraprofessionals may be a particularly important question to address, because many schools have turned to paraprofessionals to provide direct instruction to students with disabilities who need individualized instruction (Giangreco, 2010). On one hand, results of research on paraprofessionals' effects on reading achievement have identified ways in which they can be used to improve reading skills of students with learning difficulties (e.g., Lane, Fletcher, Carter, Dejud, & DeLorenzo, 2007; Vadasy, Sanders, & Peyton, 2006a, 2006b; Vadasy, Sanders, & Tudor, 2007). On the other hand, studies that have directly compared the effectiveness of teacher-led with paraprofessional-led intervention have identified the former as more effective than the latter (e.g., Ehri, Dreyer, Flugman, & Gross, 2007; Vadasy & Sanders, 2009; Wasik & Slavin, 1993). It remains unknown how often paraprofessionals rather than teachers have primary responsibility for reading instruction for students with ASD.

Similarly, the research base is silent on the question of instructional time and intensity in reading programs for K-3 students with ASD. Although many K-3 classroom reading programs are organized to provide a daily, 90- to 120-min literacy block, we were unable to locate any data on the frequency of participation of students with ASD in reading instruction, the amount of time allocated for reading instruction, or the group size in which instruction is delivered.

Finally, an electronic search of the literature failed to uncover any studies documenting the scope of reading instruction for beginning readers with ASD. Both Chiang and Lin (2007) and Whalon, Al Otaiba, and Delano (2009) concluded from their reviews of intervention research that students with ASD can benefit from some of the same instructional strategies as were recommended by the National Reading Panel (NRP; National Institute of Child Health and Human Development, 2000) in the areas of phonological awareness, phonics, fluency, vocabulary, and comprehension. At present, however, it remains unknown how often K-3 students with ASD receive instruction on these components.

The purpose of this exploratory study was to investigate, among programs for K-3 students with ASD, implementation of three conditions of reading instruction that have been identified as essential to the success of beginning readers: (a) use of personnel who are qualified to assume the responsibility, and who feel confidence in their own abilities, to deliver instruction; (b) provision of instruction with sufficient frequency and intensity to support progress; and (c) provision of instruction on the essential components of reading. To do so, we surveyed special educators to find out who provides reading instruction to students with ASD, how prepared and effective special educators perceive themselves to be in teaching reading to students with ASD, how much time is allocated for teaching reading to students with ASD, in what group size reading instruction is delivered, and the components of reading on which students receive instruction.

Method

Data were collected using an anonymous, online survey of special educators in a New England state. Two strategies were used to recruit participants. First, all special education administrators (*n* = 120) in the state were contacted by email and asked to forward an invitation to special educators having K-3 students with ASD on their caseloads. Second, state data were used to identify school districts with at least 10 students with ASD (*n* = 47). An invitation to participate was emailed to all special educators in elementary schools in those districts (*n* = 364). Teachers were instructed to respond only if they had K-3 students with ASD on their caseloads and to submit only one survey even if they received more than one invitation. At the time the study was conducted, there were no statewide initiatives related to reading or instruction for students with ASD that would have affected the expertise of participating teachers.

To maintain consistency across participants, the survey defined K-3 students with ASD as students who were identified with autism under the Individuals With Disabilities Education Improvement Act (IDEIA; 2004) and who were either in Grades K-3 or of chronological age to be in Grades K-3. Surveys were completed anonymously to encourage candid responses and to ensure that students on participating teachers' caseloads would not be identifiable.

Survey Development

The Reading Instruction Survey (RIS) was designed to investigate instructional conditions that have been identified as critical to success for beginning readers. All RIS items were developed specifically for this study with the exception of an item from the *Childhood Autism Rating Scale* (CARS; Schopler, Reichler, & Renner, 1998) and items adapted from the *Teacher Efficacy Scale* (Gibson & Dembo, 1984). Using the CARS item, teachers indicated the number of students with ASD on their caseloads performing at or in between four verbal communication levels (1 = *normal*, 2 = *mildly abnormal*, 3 = *moderately abnormal*, 4 = *severely abnormal*).

Teacher efficacy items were included to assess self-perceptions of preparation and effectiveness in teaching reading to three groups of students: students with ASD, learning disabilities (LD), and no disabilities (ND). Items were adapted from the Gibson and Dembo (1984) instrument, with wording changes to fit the task of teaching reading and to obtain ratings for each student group. The items were as follows:

- I have adequate training for teaching reading to students with (ASD, LD, ND).
- I have the ability to deliver effective reading instruction to students with (LD, ASD, ND).

We included ratings for two student groups in addition to ASD as points of comparison in interpreting results. Teachers indicated their agreement with the six statements using a 4-point Likert-type scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *agree*, 4 = *strongly agree*).

Members of the research team drafted all other items, following established procedures for survey development (e.g., Baumann & Bason, 2011; Jaeger, 1997). Each team member independently reviewed items for clarity and match to research questions, achieving 100% agreement. The survey was then piloted with a sample of graduate students who were practicing special educators using a think-aloud approach within cognitive interviewing, a technique for identifying problems with wording of questionnaires (Willis, 2005). A research assistant administered the survey individually to teachers, asking them to think aloud while answering questions. Questions that were difficult to answer or subject to multiple interpretations were eliminated or revised.

The background section of the survey included questions on respondents' gender, years of special education teaching experience, certification status, recent participation in professional development in the areas of reading and ASD, school characteristics, and caseload characteristics. School information included size and percentage of students receiving free or reduced lunch. Items about caseload addressed (a) number of students served (both with and without ASD), (b) diagnostic category within the autism spectrum, (c) functional communication skills of students with ASD (i.e., CARS ratings as discussed above), and (d) reading achievement of students with ASD. To describe reading achievement, teachers indicated the number of students with functional performance either at/above or below grade level in six areas: phonological awareness, phonics, reading fluency, vocabulary, reading comprehension, and sight words.

The first five areas corresponded to the essential components of reading for K-3 students identified by the NRP (National Institute of Child Health and Human Development, 2000) and the No Child Left Behind Act (2001). Brief descriptions of each component, shown in the appendix, provided a common frame of reference for ratings. The descriptors were adapted from *Put Reading First: The Research Building Blocks for Teaching Children to Read* (Armbruster, Lehr, & Osborn, 2006). Ratings of sight-word knowledge were included because, historically, that has been a central goal for many students with cognitive disabilities (Browder et al., 2006).

Remaining survey items, also shown in the appendix, addressed implementation of instructional conditions that have been identified as critical to beginning reading success: (a) personnel responsible for delivering reading instruction to students with ASD, (b) allocation of time and group size during reading instruction, and (c) components of reading targeted for instruction.

Results are reported below, beginning with a description of respondents, their schools, and their caseloads, and continuing with results pertaining to implementation of the three instructional conditions noted above. As can be seen in the appendix, survey items directed teachers to identify the number of students on their caseload who received a particular type of instruction, not to report practices for individuals or subgroups of students. Results, therefore, are not disaggregated by student characteristics such as grade level, diagnosis within the autism spectrum, or communication level. For example, we identify the percentage of students on teachers' caseloads who received varying amounts of instructional time, but not whether the allocation of instructional time varied by student characteristics. Most analyses were descriptive; however, where applicable, alpha was set at .05 for tests of statistical significance.

Results

Sample

A total of 66 teachers completed the survey, providing data on instructional practices for 226 K-3 students with ASD. Response rate was difficult to estimate given the lack of a statewide list of teachers serving K-3 students with ASD; however, state data for the year that the study was conducted indicated that 830 K-3 students were identified under the IDEIA category of autism. We estimated, therefore, that responses reflected the experiences of about 27% of K-3 students with ASD.

As mentioned above, surveys were completed anonymously and some teachers received two invitations to participate, one through a district administrator and one through direct email. To rule out the possibility that some teachers submitted more than one survey, we examined the data for duplicate cases on teacher, school, and caseload characteristics. None was found.

The majority of respondents were female teachers (92.4%) with prior teaching experience ($M = 10.6$ years, $SD = 8.4$). More than 90% were fully qualified as defined by the state certification office, holding either professional (78.8%) or provisional certificates for those with less than 3 years of experience (10.6%). Only 7.6% were teaching under conditional, transitional, or targeted needs endorsements, arrangements that enable districts to hire less than fully qualified teachers. Almost half (41%) were certified in both general and special education, and 88% were certified to teach students with mild/moderate disabilities rather than students with severe disabilities.

Although the state does not require teachers to have a graduate degree, 70% had post-baccalaureate degrees. Sixty-nine percent had taken at least one university course related to literacy within 3 years prior to the study, but only 35% had taken a recent course pertaining to ASD. More

than 85%, however, had participated in at least one reading-related professional development (PD) experience within 3 years prior to the study, and most had participated in multiple PD experiences in reading ($M = 3.81$, $SD = 4.01$) and/or ASD ($M = 3.12$, $SD = 3.00$).

Schools in which teachers were employed varied in size, with 80% of student populations ranging from 100 to 500. The socioeconomic status of schools, as estimated by the proportion of students receiving free or reduced lunch, reflected the level of socioeconomic diversity statewide (less than 25% = 26.3%, 25%–50% = 33.3%, 50%–75% = 29.8%, greater than 75% = 10.5%).

The number of K-3 students with ASD served by each teacher ranged from 1 to 20 ($M = 3.42$, $SD = 2.99$), with 80% serving 4 or fewer K-3 students with ASD. Overall, students with ASD comprised 5% to 100% of teachers' caseloads ($Mdn = 40\%$), indicating that most did not work exclusively with students with ASD.

The caseloads of participating teachers included more students who were diagnosed with autistic disorder (67.1%) than Asperger syndrome (17.8%) or Pervasive Developmental Disorder–Not Otherwise Specified (PDD-NOS; 14.2%). Teachers perceived 68.9% of students to have normal to mildly abnormal communication, with only 31.1% falling in the moderately abnormal to severely abnormal range.

Teachers also provided ratings of reading achievement, indicating the number of students with ASD on their caseloads who they judged to be functioning either at/above or below grade level in six areas: phonological awareness, phonics, fluency, vocabulary, comprehension, and sight-word knowledge. Descriptively, more students were rated as being at/above grade level in phonics (52.1%) and sight-word knowledge (49.7%) than in phonological awareness (38.6%), fluency (32.1%), comprehension (26.4%), or vocabulary (26.4%).

Responsibility for Reading Instruction

On the survey, teachers indicated the context in which reading instruction was delivered and the personnel responsible for instruction. As can be seen in Table 1, the most common setting for instruction was special education (42.4%); however, teachers reported that just more than half of all students with ASD participated in reading instruction in general education classrooms, either exclusively (27.8%) or in combination with special education (29.7%).

All of the special educators in the sample identified themselves as having some responsibility for reading instruction for their students with ASD. The *primary* reading instructor for students with ASD, however, was equally likely to be a special educator, general education teacher, or paraprofessional (see Table 1).

Teachers also responded to a series of Likert-type items pertaining to their preparation and effectiveness in teaching

reading: (a) I have adequate training for teaching reading to students with (ASD, LD, ND) and (b) I have the ability to deliver effective reading instruction to students with (ASD, LD, ND; 1 = *strongly disagree*, 2 = *disagree*, 3 = *agree*, and 4 = *strongly agree*). The first step in the analysis was to examine the correlation between the two items for each student group. Results indicated that teachers who perceived themselves to have better preparation to teach reading to a particular group of students also perceived themselves to be more effective in teaching reading to that group of students (ASD preparation and effectiveness r = .86, LD preparation and effectiveness r = .86, ND preparation and effectiveness r = .90).

Given this finding, we created a single index for each group by averaging each teacher's score across the two items (i.e., preparation and effectiveness). For convenience, we refer to the average score as the Efficacy for Teaching Reading index (ETR), one for teaching reading to students with ASD (ETR-ASD), one for teaching reading to students with learning disabilities (ETR-LD), and one for teaching reading to students with no disabilities (ETR-ND).

Second, we compared ETR across the three student groups. The results of repeated-measures ANOVA indicated statistically significant, within-teacher differences in ETR by group, $F(2, 122) = 8.03, p < .001, \eta_p^2 = 12$. Post hoc tests indicated significantly lower ETR-ASD (M = 2.79, SD = 0.72) than ETR-LD (M = 3.18, SD = 0.69), with teachers scoring about a half SD lower on ETR-ASD than ETR-LD (d = 0.55). ETR-ASD was comparable with ETR-ND (M = 2.98, SD = 0.73), and ETR-LD exceeded ETR-ND although only by .28 SD. About 30% of the respondents disagreed that they had sufficient training or the ability to deliver effective reading instruction to students with ASD. In contrast, only about 10% expressed lack of confidence in their training or effectiveness in teaching reading to students with LD, and only 20% expressed lack of confidence in their training and effectiveness in teaching reading to students without disabilities.

Instructional Time and Intensity

Teachers indicated that 87% of K-3 students with ASD (n = 197) received daily instruction in reading. To examine instructional intensity, we asked teachers to report the group size in which students received most of their instruction and the length of the instructional block for those who received daily instruction. As can be seen in Table 1, students with ASD received most reading instruction one-to-one or in a small group format, with few taught primarily through whole-class instruction. Similarly, groups of 2 to 4 students were more commonly used than groups of 5 to 9 or more than 10 students.

Teachers also estimated the length of the instructional block for students who received daily reading instruction (see Table 1). Among those receiving daily instruction,

Table 1. Percentage of Students With ASD on Teachers' Caseloads by Instructional Condition.

Condition	% students
Setting (n = 212)	
Special education only	42.4
General education only	27.8
Special and general education	29.7
Primary instructor (n = 214)	
Special education teacher	35.5
General education teacher	34.1
Paraprofessional	30.4
Literacy specialist	0.0
Primary instructional format (n = 215)	
One-to-one	45.1
Small group	39.5
Whole class	15.3
Primary group size (n = 208)	
One-to-one	44.7
2–4 students	30.3
5–9 students	13.0
10 or more students	12.0
Instructional time per day (n = 197)[a]	
30 min or less	15.2
31–60 min	41.1
61–90 min	32.9
More than 90 min	10.7

Note. ASD = autism spectrum disorder.
[a]Provided only for students receiving daily instruction.

instructional time varied greatly. The most prevalent time block for reading was 31 to 60 min, followed by 60 to 90 min. Only 10% received more than 90 min a day, and about 15% received 30 min or less a day of reading instruction.

Components of Reading Instruction

Teachers identified the number of students who received reading instruction on each of the five essential components of reading (i.e., phonological awareness, phonics, fluency, vocabulary, and comprehension) and on sight-word recognition. They also indicated the frequency of instruction by component.

Several trends can be seen in the data shown in Table 2. First, more than 90% of students with ASD participated in at least some instruction on each component, with at least half receiving daily instruction, and an additional 15% to 25% receiving instruction at least 3 to 4 days a week. Second, the proportion of students receiving daily instruction varied by component, ranging from 57.6% for fluency to 70.5% for phonics. The components on which students were least likely to receive regular instruction (i.e., less than once a week or not at all) were phonological awareness, fluency, and sight words.

Table 2. Percentage of Students With ASD Receiving Instruction by Reading Component and Frequency of Instruction.

Area	Student (n)	Frequency of instruction				
		Daily (%)	3–4 days a week (%)	1–2 days a week (%)	Less than once a week (%)	Not at all (%)
Phonological awareness	186	62.4	16.9	8.6	3.2	8.6
Phonics	193	70.5	16.6	6.7	3.1	3.1
Fluency	191	57.6	24.1	8.4	5.2	4.7
Vocabulary	196	59.2	21.9	16.8	0.0	2.0
Comprehension	191	69.1	21.8	9.0	1.6	1.6
Sight words	196	66.8	14.8	8.7	1.5	8.2

Note. ASD = autism spectrum disorder.

Discussion

In this study, we surveyed special education teachers to investigate beginning reading instruction for students with ASD. Survey items addressed three instructional conditions that have been identified as essential to reading success in Grades K-3: (a) use of personnel who are qualified, and who feel confidence in their own abilities, to assume the responsibility; (b) provision of instruction that is of sufficient frequency and intensity to support progress; and (c) provision of instruction on essential beginning reading components.

Responsibility for Reading Instruction

All survey participants indicated that they provided at least some reading instruction to students with ASD. The majority were experienced special educators who were fully qualified as professional special educators, had participated in recent professional development experiences pertaining to ASD and to reading, and had taken recent university course work in reading. In addition, about half were also certified as general education teachers.

Despite these general qualifications, roughly a third of the teachers did not consider themselves to have adequate training or skills to be effective in teaching reading to students with ASD. In addition, teachers rated themselves lower on preparation and effectiveness in teaching reading to students with ASD than to students with LD, another group with low reading achievement. This is a potentially important finding given the link between self-perceptions of teaching competence and teacher behavior. As mentioned above, teachers with stronger versus weaker self-efficacy tend to work longer with students who are experiencing difficulties (Gibson & Dembo, 1984), to be more planful and organized (Allinder, 1994), to set higher end-of-the-year goals for their students (Allinder, 1995), and to express more willingness to try out new methods (Berman et al., 1977; Guskey, 1988).

In addition, teachers reported that the *primary* reading instructor for students with ASD was just as likely to be a paraprofessional as a special or general education teacher. This finding runs counter to the rule of thumb that students with the most complex needs in reading should be taught by the most qualified professionals, and the finding that teacher-led interventions are generally more effective than paraprofessional-led interventions (Ehri et al., 2007; Vadasy & Sanders, 2009; Wasik & Slavin, 1993). Prior reports have identified an increase in the use of paraprofessionals to provide direct academic instruction to students with disabilities (Giangreco, 2010), but they have not identified the specific areas of instructional responsibility for their work. The results of the present study indicate that beginning reading instruction is an area in which paraprofessionals are given primary responsibility for a substantial percentage of students with ASD.

Instructional Time and Intensity

Historically, many students with ASD were excluded from reading instruction (Kliewer & Biklen, 2001; Mirenda, 2003). Teachers in the present study, in contrast, indicated that 87% of students with ASD received daily instruction. In addition, just more than half participated in at least some reading instruction in general education classrooms. These findings suggest that progress has been made in providing access to reading instruction. Similarly, prior research has indicated greater effectiveness of one-to-one or small group instruction over whole-class or large group instruction, particularly for beginning readers and students with reading difficulties (Wanzek & Vaughn, 2007). The present results suggest that students with ASD do receive most of their instruction in more intensive contexts.

At the same time, teacher reports indicated that about half of their students received fewer than 60 min of instruction per day, and more than a quarter received 30 min or less of instruction a day (inclusive of the 13% who received less than daily instruction). These results are inconsistent with the recommendation of beginning reading experts regarding implementation of a 90- to 120-min reading instructional block in Grades K-3, and provision of additional instructional time beyond the standard block for students performing below grade level in reading.

Components of Reading Instruction

Teachers indicated how often in a typical week, students on their caseloads received instruction on five essential components of reading and sight-word recognition. The pattern of results in the present study indicated that most K-3 students with ASD received more comprehensive instruction than the functional sight-word approach that has been widely used in the past with students with cognitive disabilities (Browder et al., 2006). Indeed, sight-word knowledge was one of the three least-frequent instructional targets.

Limitations and Implications for Research and Practice

This study had several limitations. First, the data depicted the practices of a volunteer sample of teachers working in one state. Also, because surveys were anonymous, we were unable to compare responders and non-responders to identify possible differences between them. Caution is therefore needed in generalizing results to broader populations of special educators.

Second, we relied on self-report to identify instructional practices. This is a strategy that has frequently been used in research on reading instruction (e.g., Baumann, Hoffman, Duffy-Hester, & Ro, 2000; Mesmer, 2006), but it has well-known limitations. Tools such as teacher logs (e.g., Kurz et al., 2014; Rowan, Camburn, & Correnti, 2004) and direct observation (e.g., Whalon & Hart, 2011) are recommended to validate survey results in subsequent research.

Third, the study was not designed to investigate the relationship between instructional practices and student characteristics (e.g., grade level, diagnosis, or communication level). Questions directed teachers to identify the number of students on their caseload who received a particular type of instruction, not to report practices for individual students. A logical next step in this line of research is to collect data at the level of the individual student to enable disaggregation of results by student characteristics. For example, some students may not have received instruction on a component such as phonological awareness because they no longer required instruction in that area.

The above limitations notwithstanding, this study serves to direct the attention of researchers to questions for further study and to alert practitioners to potential areas of need in delivering reading instruction to students with ASD. Given the well-established link between instructional time and achievement, we recommend that school personnel evaluate the adequacy of instructional time in reading for students with ASD. In addition, the expertise and self-efficacy of personnel used to deliver reading instruction to students with ASD should be examined rather than assumed to ensure that readers with the greatest needs receive instruction from personnel with the greatest expertise.

Conclusion

The results of this exploratory study shed light on the conditions of school-based reading instruction for some K-3 students with ASD, an area in which there has been little prior research. On the positive side, teachers indicated that the vast majority of students with ASD participated in daily reading instruction and received more comprehensive instruction on the essential components of reading than the sight-word approach that has been used in the past. Of concern, though, were the findings that almost one third of students received primary instruction from a paraprofessional, a sizable percentage of teachers lacked confidence in their preparation and effectiveness in teaching reading to students with ASD, and a majority of students received less than the recommended instructional time for K-3 reading. The first step in solving a problem is identifying the problem. The present study has identified several problems in some school programs that, if addressed, could lead to improved reading achievement among K-3 students with ASD.

Appendix

Descriptors of Components of Reading on the Reading Instruction Survey

Phonological awareness: Ability to identify and manipulate sounds in speech (e.g., rhyming, alliteration, and elision)

Phonics: Knowledge of letter–sound correspondences and their use in reading and spelling, decoding unfamiliar words

Sight words: Recognition of familiar whole words in print

Fluency: Reading with speed, accuracy, and proper expression

Comprehension: Constructing meaning from text

Vocabulary: Understanding word meanings

Items From Reading Instruction Survey Pertaining to Responsibility for Reading Instruction, Frequency and Intensity of Instruction, and Scope of Instruction

Responsibility for reading instruction

1. How many of your K-3 students with autism receive reading instruction in the following environments: Special Education setting *only*, General Education setting *only*, Special Education setting *and* General Education setting, Other (please specify)?
2. How many of your K-3 students with autism receive any reading instruction from the following personnel: You, Other special education teacher, General

education teacher, Paraprofessional, Literacy specialist or other reading interventionist, Other (please specify)?

3. How many K-3 students with autism receive *MOST* of their reading instruction from each of the following personnel: You, Other special education teacher, General education teacher, Paraprofessional, Literacy specialist or other reading interventionist, Other (please specify)?

Frequency and intensity of instruction

4. How many students with autism receive *most* of their reading instruction in the following formats: Large group/whole-class, Small group, One-to-one?

5. How many students with autism receive *most* of their reading instruction in the following group sizes: 10 or more students, 5 to 9 students, 2 to 4 students, One-to-one (see Note 1)?

6. Think about the total amount of instructional time for K-3 students with autism who receive some reading instruction *daily*. How many receive reading instruction each day for 30 min or less, 31 to 60 min, 61 to 90 min, More than 90 min?

Components of reading instruction

7. How many K-3 students with autism receive instruction in each of the following areas (phonological awareness, phonics, reading fluency, vocabulary, reading comprehension, sight words), and how often (daily; 3–4 days a week; 1–2 days a week; less than once a week; not at all)?

Declaration of Conflicting Interests

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Note

1. Questions regarding format and group size were not presented consecutively on the online survey.

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