Using Response to Intervention for Speech Sound Disorders: Exploring Practice Characteristics and Geographical Differences

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Purpose: Speech sound disorders (SSDs) comprise a large percentage of school-based speech-language pathologists’ (SLPs) caseloads, particularly for those practicing in elementary schools. Many service delivery models have been proposed to manage rising caseload sizes. One particular approach, response to intervention (RTI), was introduced as an optional model of intervention in the 2004 reauthorization of the Individuals With Disabilities Education Act and in the 2015 Every Student Succeeds Act. This model ensures that children who may not yet require special education services still receive individualized support. Given the risk for literacy, cognitive, and social impairments in children with SSDs, it is imperative to explore how RTI is implemented for this population of children.

Method: In this study, we asked 575 school-based SLPs if they implement RTI for children with SSDs. Furthermore, we explored which practice characteristics and geographical factors may be associated with the use of RTI for children with SSDs.

Results: SLPs with smaller caseloads are more likely to implement RTI for children with SSDs.

Conclusions: RTI is an optional approach that should be considered for children with SSDs to ensure appropriate and timely service provision. However, the characteristics of an SLP’s work setting, such as caseload size, may impede the use of this approach. As such, administrators should work to improve the workload for SLPs, and state legislators should work to support RTI as an option for SLP services.

Speech sound disorders (SSDs) are characterized by a delay in acquisition of appropriate speech sounds (Lewis et al., 2006), which can influence academic, linguistic, vocational, and socioemotional skills in children and adolescents (Hitchcock, Harel, & Byun, 2015; McCormack, McLeod, McAllister, & Harrison, 2010; McLeod & Harrison, 2009). SSDs include deficits that may have previously been categorized as either “articulation” or “phonological” (Pennington, 2006). Children with SSDs are at an increased risk for language and literacy deficits, as they often have poor phonological processing skills (Cabbage, Farquharson, & Hogan, 2015; Farquharson, 2015; Farquharson, Hogan, & Berenthal, 2017; Leitao & Fletcher, 2004; Leitao, Hogben, & Fletcher, 1997; Lewis & Freebairn, 1992; J. Preston & Edwards, 2010; Raitano, Pennington, Tunick, Boada, & Shriberg, 2004). In addition, children with persistent SSD have a higher rate of comorbid oral language impairment and/or reading disability compared with children with normalized speech sound
production (Lewis et al., 2015). School-based services are critical to creating positive effects on students’ speech, language, and literacy outcomes. As such, it is imperative to explore the factors that contribute to service provision for children with SSDs. Generally, children with SSDs are formally assessed and treated through Individualized Education Programs (IEPs) or 504 plans, which place them on a speech-language pathologist’s (SLP) caseload. However, the 2004 reauthorization of the Individuals With Disabilities Education Act (IDEA) introduced a method of service delivery called response to intervention (RTI; IDEA, 2004b). RTI is a preventative model using multiple tiers of increasingly intensive and specialized instruction (Ehren, Montgomery, Rudebusch, & Whitmire, 2006; Farquharson-Schussler, 2008; Justice, 2006). In the 2004 amendment of IDEA, a clause about RTI was included in the regulations for identifying children with specific learning disabilities (SLDs) to be determined by each state (IDEA, 2004a). This study investigates the use of RTI as an optional model of service provision in schools across the United States and the various factors that may affect its implementation and use for children with SSDs.

RTI and the SLP

RTI is a multitier system of supports and an optional approach to service delivery under IDEA for identifying children with SLDs. This model ensures that there are systems in place in general education to help all students to be successful both behaviorally and academically using evidence-based instruction and interventions, with regular monitoring of the response to these interventions (Heinemann, Bolanos, & Griffin, 2017; Rudebusch & Wiechmann, 2011). In 2015, the Every Student Succeeds Act (ESSA) highlighted multitier system of supports as a means by which schools could flexibly use Title I and IDEA funds to provide services to children who are struggling. Specifically, ESSA supports the provision of services to students "who are not currently identified as needing special education or specialized instructional support but who need additional academic and behavioral supports to succeed in a general education environment" (American Speech-Language-Hearing Association [ASHA], 2016b, p. 17).

RTI is a three-tiered system, although Shapiro (2014) mentions subdivision of tiers and four-tiered models. Tier 1 involves evidence-based, high-quality instruction at the general classroom level; Tier 2 includes supplemental instruction for those who require additional intervention; and Tier 3 includes specialized instruction for those who require maximum supports (Heinemann et al., 2017). These increasingly intense tiers of intervention are intended to create a preventative model promoting positive academic outcomes for all students (Dexter, Hughes, & Farmer, 2008; Heinemann et al., 2017; A. I. Preston, Wood, & Stecker, 2015). Several benefits to RTI have been noted, including a reduction in inappropriate special education referrals, quicker identification of students with disabilities, and improved collaboration between teachers, special educators, and parents (Farquharson-Schussler, 2008; Heinemann et al., 2017; Moore-Brown, Montgomery, Bielinski, & Shubin, 2005). SLPs are uniquely qualified to contribute to RTI efforts, particularly with language instruction, identifying patterns of student need, and explaining the relationship between spoken and written language (Rudebusch, 2008). Through this framework, SLPs can work preventatively to track the progress of at-risk students so that appropriate intervention can be applied for communication disorders in a timely manner.

RTI and SSDs

RTI addresses both special and general education by providing opportunities for the majority of students to progress at the expected rate through early identification and intensive interventions (Heinemann et al., 2017). This framework encourages educators to be proactive in the early identification of delays that may evolve into more substantial learning disabilities. This approach is applicable to SSDs given their robust relation to later literacy outcomes (Cabbage et al., 2015; Farquharson et al., 2017; J. Preston & Edwards, 2010; J. L. Preston & Edwards, 2007; J. L. Preston, Hull, & Edwards, 2013; Raitano et al., 2004) and the residual language and cognitive effects (Couture & McCauley, 2000; Farquharson, 2015; Farquharson et al., 2017; Lewis & Freebairn, 1992). For instance, children who demonstrated improvements in speech production skills through therapy or spontaneous change were shown to have stronger reading skills by
the end of the school year (Foy & Mann, 2012; M. S. Overby, Trainin, Smit, Bernthal, & Nelson, 2012). Furthermore, the previously noted benefits of RTI also apply when RTI is used to identify and treat students with SSDs. Mire and Montgomery (2009) found that 98% of students with between one and two speech sound errors remediate these errors in less than 9 months in an RTI framework. This time was shorter than the typical eligibility process (Mire & Montgomery, 2009). In addition, RTI and progress monitoring can be effectively used to treat children with SSDs who may not qualify under IDEA based on specific state criteria concerning the “educational impact” of those errors (Farquharson & Boldini, in press; Mire & Montgomery, 2009). A separate case study by Taps (2008) also showed that children with mild SSDs remained on caseloads for an average of 3 years and received between 50 and 100 hr of treatment, leading to overall higher caseloads for SLPs. When an RTI framework was implemented, the number of students with mild articulation disorders on IEPs reduced from 821 to 95 students over the course of 4 years (Taps, 2008). Students who were being treated through RTI for SSDs completed the intervention within 17–20 hours of treatment, a significantly shorter time frame compared with an IEP. Furthermore, even when students were referred for an IEP after being treated through an RTI model, they required significantly less time in therapy than students who began treatment on an IEP (Bruce, Peter, & Weinhold, 2017). Because children with more severe SSDs required a longer time to complete RTI, it was also possible to predict which students would likely need an IEP based on how they fared in the RTI framework (Bruce et al., 2017). Though there is evidence for the positive outcomes of RTI implementation for treating SSDs, it remains unclear how frequently or consistently this model of service delivery is used across the United States for this population. In addition, the factors that influence how and why SLPs engage in an RTI framework are unknown.

Effects of Legislation on Variable Implementation of RTI

According to IDEA, a child may have an SLD if they do not achieve grade-level standards in areas including oral expression, listening comprehension, written expression, basic reading skills, reading comprehension, and reading fluency skills (IDEA, 2004a). In this context, RTI is mentioned as a way to prevent reliance on a discrepancy model (IDEA, 2004a). Reference to SLDs, instead of specific communication impairments, may contribute to the inconsistent use of RTI for SSDs. As SSDs are not specifically noted as an SLD, these children may not be identified or treated through an RTI system as outlined by federal law. Furthermore, a child may not qualify for any services at all if there is no evidence of “educational impact” due to the SSD (Dublinske, 2002; Farquharson & Boldini, in press; Thomas, 2016).

State-Based Implementation of RTI

When determining intervention needs for children with SSDs, state variance in interpretation of the federal legislation may affect whether a child receives intervention. As dictated by national IDEA regulations, all states “must permit the use of a process based on the child’s response to scientific, research-based intervention” (IDEA, 2004b); however, states can choose if and to what extent this is implemented (Zirkel, 2012). Therefore, RTI systems could be implemented only to identify children with SLDs or extend to other communication disorders, such as SSDs, depending on a state’s interpretation of this clause.

Guidelines vary widely across states and U.S. regions (Zirkel, 2012). There is variability in how federal legislation is interpreted by states and regions regarding speech and language eligibility determination and service provision, and the source of these guidelines varies between SLPs (Farquharson & Boldini, in press). Inconsistent and ambiguous state and regional interpretations of federal IDEA guidelines affect whether children with SSDs are being included for identification through an RTI system. Relatedly, variability in the source of SLPs’ eligibility guidelines can affect how SLPs provide services through RTI for students with SSDs. By examining potential sources of variability in state-wide RTI services, we can get a better understanding of how SSDs are addressed through RTI systems across different states and regions.
SLP’s Practice Characteristics as Factors in RTI Implementation

Administrative, experiential, and practical factors at the level of the individual SLP could cause potential variability in RTI use for SSDs. To understand the factors that underlie such variability, it can be useful to examine how practice characteristics such as caseload size, number of schools served, and years of experience play a role in an SLP’s decision to use RTI for this population.

The size of an SLP’s caseload may determine whether he or she incorporates RTI as a method of speech and language intervention (Sanger, Snow, Colburn, Ganger, & Ruf, 2012). Although many SLPs have noted that they appreciate the benefits of implementing RTI frameworks, demanding workloads and caseloads can be obstacles in using RTI systems (Sanger, Mohling, & Stremlau, 2012). SLPs have reported that their caseloads were less manageable when their caseload sizes were larger (Katz, Maag, Fallon, Blenkarn, & Smith, 2010). Furthermore, SLPs with large caseloads were unsure of how to apply RTI principles without adequate training, staff, and time (Sanger, Snow, et al., 2012). Although many sources suggest that it is necessary to move from a caseload approach to a workload approach to allow complete SLP involvement in RTI models (Ehren, 2007; Rudebusch & Weichmann, 2011), this shift often requires systemic change. Just as large caseload sizes can be a challenging factor when incorporating RTI, serving multiple schools might also increase an SLP’s workload demands (Ehren, 2007); this, in turn, may affect how well SLPs are able to apply RTI models, in addition to the caseload demands they are responsible for across multiple schools. As such, another aim of this study is to explore how caseload size and number of schools served are related to the use of RTI for children with SSDs.

Implementation of RTI may also be affected by the experience that an SLP has with this framework both in terms of educational and practical knowledge. For instance, graduate education prior to 2004 would not have discussed the principles of RTI, as IDEA had not yet been reauthorized. Conversely, after the reauthorization, graduate education curricula would have been more likely to include information regarding RTI frameworks. However, one study did find that the majority of SLPs were involved in continued education opportunities regarding RTI, regardless of years of experience in the field (Sanger, Mohling, et al., 2012); however, many SLPs also reported limited education and training regarding RTI and acknowledged the need for more information on the model (Sanger, Mohling, et al., 2012). Furthermore, Katz et al. (2010) reported that SLPs with fewer years of experience reported finding their caseloads more manageable than those SLPs with more years of experience. The researchers attribute this finding to changes within the field over the past decade, which might include the introduction of RTI systems into the school. Therefore, if less seasoned SLPs find their larger caseloads more manageable than their seasoned colleagues, it might be because they are more likely to incorporate RTI as a method of service delivery for their students.

This Study

RTI was created as a multitiered system of support to comply with IDEA standards. Because RTI is optional in the legislation, it is unclear when RTI is implemented for children with SSDs and how that varies across the nation. Therefore, this study aims to investigate variables that may affect whether an SLP uses RTI to address SSDs in a school-based population. Using a nationally distributed survey, the researchers explored the following questions:

1. Do SLPs use RTI or similar multitiered systems of support to address SSDs?
2. Do SLPs’ practice characteristics (i.e., caseload size, number of public schools served, years of experience) affect whether they use RTI to address SSDs?
3. Does the state or region in which an SLP practices affect his or her use of RTI for SSDs?
4. Where do SLPs obtain guidelines for implementing an RTI model for SSDs, if at all?
Method

Data for this study were collected from a 53-question, web-based survey developed in 2016, which was nationally distributed to school-based SLPs (Farquharson & Boldini, in press). The questionnaire was created using SurveyMonkey, an online survey program. Those who responded to the survey provided demographic information, information regarding their caseload and current occupational role, the eligibility and dismissal criteria for children with SSDs at their school, and their interpretation of IDEA and educational need. Question types included multiple choice, select all that apply, dropdown menu, and fill in the blank. The survey took approximately 15–20 min to complete and was open for 13 weeks. Participants who completed the survey were entered into a raffle to win one of two $100 Amazon gift cards.

Public school SLPs were recruited via e-mail and social media. Messages about the survey included information about the purpose of the survey, the estimated completion time, information about the raffle, and the link to the survey. Reminders were also sent to potential participants 1 week before the survey closed. A total of 844 SLPs visited the survey link, and 575 SLPs completed the entire survey for a 68% completion rate. Partial completions were included in data analysis only for questions that were answered.

SLPs who were currently working in IDEA-funded schools from all 50 states and Washington, DC, participated in the survey. These states were divided into nine regions based on the U.S. Census, including Pacific, Mountain, West North Central, West South Central, East North Central, East South Central, South Atlantic, Middle Atlantic, and New England (U.S. Census Bureau, 2010). Participants reported a wide range of experience from less than 1 year to more than 20 years. Reported caseload sizes ranged from eight to 146 clients. All respondents reported working with children who had an SSD; this included children with diagnoses of SSD only or children with SSD comorbid with another disorder. Respondents varied with respect to the grade levels with which they worked, including preschool (n = 268), elementary school (n = 625), middle school (n = 246), and high school (n = 168). Note that respondents could choose multiple grade levels, as it is common for a single clinician to provide services to multiple schools. In our sample, most respondents indicated only providing services to one school (n = 412); however, some participants indicated providing services to up to four schools (n = 52; see Farquharson & Boldini, in press, for more information).

The survey examined the associations between caseload size, number of schools served, geographical region, an SLP’s years of experience, and the source of an SLP’s eligibility guidelines on the use of RTI for children with SSDs. Analyses were initially applied to all 50 states, but more specific analyses were conducted for the states of Massachusetts (MA), Texas (TX), California (CA), and New Jersey (NJ). These four states were chosen for further analyses as they provided the highest number of responses (MA, n = 69; TX, n = 52; CA, n = 44; NJ, n = 42) and represented some geographic variety. In addition, each state showed significant variability in its guidelines for RTI. For example, the California Department of Education’s (CDE, 2009) report on the use of RTI notes that some SLPs use the system to treat speech-only articulation difficulties to benefit oral language development. However, NJ notes that articulation disorder evaluations must be conducted formally with no mention of using RTI systems for this evaluative process (Special Education Code, 2016).

From the survey questions, Question 20 “Does your school provide services to children with SSD through a Response to Intervention (RTI) or similar model?” was analyzed in association with other survey questions including the following:

1. In what U.S. state or territory do you work?
2. How many years of experience do you have working as an SLP?
3. What is your current caseload size?
4. How many public schools do you serve?
5. Think about the current criteria used to identify a child with an SSD as needing an IEP at your school. Please choose one primary source of these criteria.

**Results**

To analyze the research questions in this study, the entire sample ($n = 575$) was analyzed. Data from the four states with the most responses (CA, MA, NJ, and TX) were also compared. The use of RTI for SSDs was a variable in all analyses. Approximately half of the SLPs reported using RTI (46.7%, $n = 313$) and 53.3% reported not using RTI ($n = 357$) to provide services to children with SSDs.

**RTI and Caseload Size**

The first research question analyzed the association between the use of RTI and an SLP's caseload size. Participants reported caseload sizes in whole numbers, which were recategorized into three groups: small (0–40), average (41–60), and large (61 or more; Biancone, Farquharson, Justice, Schmitt, & Logan, 2014). Of the reporting SLPs, 28.4% ($n = 204$) reported small caseload sizes, 51.78% ($n = 371$) reported average caseload sizes, and 19.9% ($n = 143$) reported large caseload sizes. A chi-square test of independence showed a significant association between the use of RTI and the size of an SLP's caseload, $\chi^2(2, N = 669) = 7.909, p = .019$. More specifically, having a small caseload was significantly associated with the use of RTI than having an average caseload, $\chi^2(1, N = 542) = 7.107, p = .008$. No significant differences were found between small and large caseload sizes or average and large caseload sizes.

**RTI and Geographical Region**

This question examined the association between the use of RTI and geographical region of the United States. U.S. Census regional divisions were used to group states (U.S. Census Bureau, 2010). A chi-square test of independence was used to analyze the association between the use of RTI and regions of the United States. These results were not significant across the nine regions, $\chi^2(1, N = 542) = 7.107, p = .136$. However, as many states had low numbers of participants (e.g., Montana, $n = 1$), use of RTI was analyzed within the four states with the largest number of respondents (CA, MA, NJ, TX); these states also happen to lie within four of the nine regions outlined by the U.S. Census. Table 1 displays the descriptive statistics for each state's use of RTI. A chi-square test of independence was used to analyze the differences between the four states with the most responses. Significant differences were found between NJ and the three other states (see Table 2). Many more participants in NJ reported that they did not use RTI as compared with SLPs in MA, CA, and TX.

**Table 1. Percent of SLPs who use RTI to treat children with SSDs by state.**

<table>
<thead>
<tr>
<th>State</th>
<th>Percent that uses RTI</th>
<th>Percent that does not use RTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA</td>
<td>51.4%</td>
<td>48.6%</td>
</tr>
<tr>
<td>MA</td>
<td>45.5%</td>
<td>54.5%</td>
</tr>
<tr>
<td>NJ</td>
<td>19.5%</td>
<td>80.5%</td>
</tr>
<tr>
<td>TX</td>
<td>51.1%</td>
<td>48.9%</td>
</tr>
</tbody>
</table>
This research question explored the association between the use of RTI and the number of years that an SLP had been practicing. Data for this variable were divided into four categories of years of experience: 0–4, 5–10, 11–15, and 16–20 or more. A chi-square test of independence was not significant, \( \chi^2(3, N = 669) = 2.937, p = .401 \). This variable was later divided into two groups, 0–20 years and 20 years or more. The researchers believed this would more accurately capture those SLPs who were educated prior to the 2004 change in legislature and those who received graduate education after this change. A chi-square test of independence was not significant, \( \chi^2(1, N = 669) = 0.098, p = .754 \).

### RTI and Number of Schools Served

This research question investigated the association between the number of schools that an SLP serviced and the use of RTI for SSDs. When reporting the number of schools they serviced, participants could choose between one, two, three, or four or more schools. A chi-square test of independence was not significant, \( \chi^2(3, N = 670) = 5.427, p = .143 \).

### RTI and Source of Eligibility Guidelines

The final research question examined the association between SLPs’ use of RTI and where they received information about eligibility criteria for identifying students with SSDs. When choosing a primary source of eligibility criteria, participants could select either of the following: (a) state guidelines; (b) district guidelines; (c) State Speech-Language-Hearing Association (e.g., Mississippi Speech-Language-Hearing Association, Texas Speech-Language-Hearing Association [TSHA]); (d) federal guidelines (IDEA); (e) My school provides me with guidelines, but I am not sure where those guidelines originate; or (f) other. Group differences were analyzed using frequency information for the four states with the most respondents (CA, MA, NJ, TX). The percentage of total respondents from each state who chose each variable is reported in Table 3. For three of the four states analyzed, “state” was the choice made by the majority of respondents; however, the majority of respondents from MA chose “district guidelines.”

#### Table 2. Differences in RTI use in NJ compared with CA, MA, and TX.

<table>
<thead>
<tr>
<th>Compared states</th>
<th>( \chi^2 ) statistic</th>
<th>( p ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA and NJ</td>
<td>( \chi^2(1, N = 78) = 8.711 )</td>
<td>( p = .003 )</td>
</tr>
<tr>
<td>MA and NJ</td>
<td>( \chi^2(1, N = 107) = 7.432 )</td>
<td>( p = .006 )</td>
</tr>
<tr>
<td>TX and NJ</td>
<td>( \chi^2(1, N = 86) = 9.292 )</td>
<td>( p = .002 )</td>
</tr>
</tbody>
</table>

#### RTI and SLPs’ Years of Experience

This research question explored the association between the use of RTI and the number of years that an SLP had been practicing. Data for this variable were divided into four categories of years of experience: 0–4, 5–10, 11–15, and 16–20 or more. A chi-square test of independence was not significant, \( \chi^2(3, N = 669) = 2.937, p = .401 \). This variable was later divided into two groups, 0–20 years and 20 years or more. The researchers believed this would more accurately capture those SLPs who were educated prior to the 2004 change in legislature and those who received graduate education after this change. A chi-square test of independence was not significant, \( \chi^2(1, N = 669) = 0.098, p = .754 \).

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#### Table 3. Source of eligibility criteria when identifying children with SSD by state.

<table>
<thead>
<tr>
<th>Reported</th>
<th>State</th>
<th>State</th>
<th>District association</th>
<th>Federal</th>
<th>School</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA</td>
<td>57.1%</td>
<td>17.1%</td>
<td>0.0%</td>
<td>11.4%</td>
<td>2.0%</td>
<td>11.4%</td>
</tr>
<tr>
<td>MA</td>
<td>18.6%</td>
<td>30.5%</td>
<td>5.1%</td>
<td>20.3%</td>
<td>5.1%</td>
<td>20.3%</td>
</tr>
<tr>
<td>NJ</td>
<td>84.2%</td>
<td>2.6%</td>
<td>0.0%</td>
<td>10.5%</td>
<td>0.0%</td>
<td>2.6%</td>
</tr>
<tr>
<td>TX</td>
<td>28.6%</td>
<td>20.0%</td>
<td>34.3%</td>
<td>11.4%</td>
<td>5.7%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
Discussion

This study investigated the variability in the implementation of RTI for treatment of SSDs in school-based settings. The researchers examined the following questions:

1. Do SLPs use RTI or similar multitiered systems to address SSDs?
2. Do an SLP’s practice characteristics (i.e., caseload size, number of public schools that they serve, years of experience) affect whether he or she uses RTI to address SSDs?
3. Does the state or region in which an SLP practices affect his or her use of RTI for SSDs?
4. Where do SLPs obtain guidelines for implementing an RTI model for SSDs, if at all?

Responses across all 50 states, as well as state-specific responses (i.e., CA, MA, NJ, and TX), were analyzed to explore variability. The results of these analyses led to three key findings in this study. First, although all respondents reported working with children with SSDs, less than half said that they used RTI as a method of service delivery for these children. Second, some aspects of an SLP’s practice characteristics (e.g., caseload size) have significant implications for whether they use RTI to treat SSDs. Third, there is significant variability between states regarding where SLPs receive their guidelines for implementation of RTI and whether they adhere to these guidelines.

SLP Use of RTI for Children With SSDs

Before examining specific factors that might affect an SLP’s use of RTI, the researchers explored how many SLPs reported using a multitiered system of intervention to treat SSDs. According to responses from this study, roughly half of SLPs use RTI to treat SSDs and half do not. However, all participants reported treating children with SSDs on their caseloads. This reflects data from The ASHA’s 2016 Schools Survey Report, which states that 88.7% of school-based SLPs regularly provide services to children with SSD (ASHA, 2016a). This report also indicates that the average number of children with SSDs on a caseload is the second highest of all communication disorders addressed by school-based SLPs (ASHA, 2016a). However, it is noteworthy that less than half of the participants in this survey reported using RTI as a method of service delivery for these students. As seen in previous studies (Bruce et al., 2017; Mire-Montgomery, 2009; Taps, 2008), the implementation of RTI for students with SSDs can be beneficial for both students and SLPs. Thus, it is surprising that the number of SLPs who report using RTI for SSDs does not parallel the number of SLPs who report addressing SSDs overall. However, this outcome was expected given the ambiguity of federal guidelines for RTI and the variety of ways this is interpreted by individual states for addressing disorders and disabilities outside of SLDs (Zirkel, 2012). This information provides important details about how treatment is being implemented for children with SSDs. Taken together, it is clear that, although the great majority of SLPs are working with students with SSDs, half do not use RTI or multitiered systems to provide intervention; rather, they seem to use IEPs or 504 plans where a child is likely formally evaluated and placed on the SLPs’ caseload. It is certainly plausible that this team-based decision is made because IEPs were considered the most appropriate placement or service delivery model for a particular child. However, this can have repercussions in increasing the size of an SLP’s caseload and the number of children who are placed on IEPs (Mire-Montgomery, 2009; Taps, 2008).

SLP Practice Characteristics

The researchers specifically explored the relation between the use of RTI and caseload numbers, the number of public schools served, and the SLP’s years of experience. Significantly more SLPs with small caseloads reported implementing RTI for treating students with SSDs than those with average-sized caseloads. This aligns with previous research, which surveyed SLPs about their use of RTI; many SLPs with large caseloads noted that they felt uncertain on how to implement multitiered systems of intervention, such as RTI, into their workload without additional help (Ehren, 2007; Sanger, Snow, et al., 2012) and that larger caseloads were considered to be

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“a problem” (Chiang & Rylance, 2000, p. 31). SLPs with larger caseloads have also reported that collaboration with other professionals is more difficult (Katz et al., 2010). However, caseloads were perceived as more manageable with higher levels of collaboration. As the foundation of RTI is based upon collaboration between all educators in a school system, implementing RTI could potentially assist in making an SLP’s large caseload more manageable overall. It is striking that SLPs with larger caseloads are less likely to use RTI considering that previous literature supports that it can reduce the number of children referred and placed in special education, thus lowering caseload numbers (Ehren et al., 2006; Moore-Brown et al., 2005; Taps, 2008). The outcome that SLPs with smaller caseloads are more likely to use RTI suggests that the decreased workload associated with a smaller caseload size allows for SLPs to incorporate RTI as a system of intervention. However, implementing RTI into schools where SLPs have larger caseloads may increase the workload demands for the SLP. Many sources have reported that using a traditional caseload model is detrimental to the implementation of RTI and that it is necessary to use a workload model to effectively involve SLPs in an RTI model (Ehren, 2007; Ehren et al., 2006; Rudebusch & Wiechmann, 2011). This finding is important in considering how SLPs’ caseloads and workloads may have an effect on the quality or quantity of services provided (see Biancone et al., 2014). It may also affect an SLP’s ability to effectively function in a school system that uses RTI. In fact, some SLPs have reported that large caseloads can interfere with their professional responsibilities, including providing less than the necessary amount and type of therapy for a student (Chiang & Rylance, 2000).

We found also that the number of public schools that an SLP served was not significantly related to his or her use of RTI. This did not support our original hypothesis that the more schools that an SLP served, the more likely he or she would be to use RTI. Although caseload demands increase when an SLP serves a larger number of schools, research suggests that SLPs do not find that their caseloads are less manageable if they serve more schools (Katz et al., 2010); thus, it makes sense that SLPs who work at multiple schools would not be more likely to use RTI as this factor does not seem to affect the manageability of their caseloads overall. This finding could also be related to the variability in implementation of RTI at the individual school level. Although an SLP may use RTI to treat SSDs at one of the schools that he or she serves, school-level differences may affect whether this is consistent across all schools in a district. Despite state- and district-level legislation, individual schools can choose to continue to use a discrepancy model to identify students with disabilities (IDEA, 2004b). This finding suggests that the variability in the interpretation of federal guidelines about RTI can extend to the individual school level.

An SLP’s number of years of experience in the workforce was also not significantly related to his or her use of RTI. This result did not support the researchers’ hypothesis that SLPs with more than 20 years of experience would be less likely to use RTI than SLPs with fewer than 20 years of experience, given that the changes to IDEA to include guidelines for RTI implementation occurred in 2004. Furthermore, as SLPs with more years of experience were less likely to feel that larger caseloads were unmanageable (Katz et al., 2010), we expected that SLPs with more years in the workforce might report less use of RTI as they did not need to implement this to better manage their work demands. However, though this finding was not statistically significant, it supports the research that suggests that many school-based SLPs attend workshops, conferences, and in-services on RTI (Sanger, Snow, et al., 2012). It also indicates that both early and seasoned SLPs are equally educated on updates to the legislation. Furthermore, it suggests that SLPs with significant experience who entered the workforce prior to the changes in IDEA are as well versed in updates to federal and state legislation and district and school policies on the use of RTI. As this variable did not seem to affect an SLP’s use of RTI, it seems that the legislation that determines RTI use is equally ambiguous to all SLPs regardless of amount of experience working in the school system.

State-Level Differences in RTI Use

We investigated potential regional and state differences in the use of RTI for SSDs. We found significant variability between the four largest responding states (CA, MA, NJ, and TX), specifically
between NJ and the other three states. Although some SLPs in NJ reported using RTI to treat students with SSDs, the majority of SLPs in this state reported not using RTI for SSD treatment. In contrast, significantly more SLPs in CA, MA, and TX reported using RTI to treat articulation or phonological disorders. However, with the exception of NJ, there were no significant differences between the number of SLPs who implemented or did not implement RTI within the states of CA, MA, and TX. This result was unexpected, given that each of these states has provided guidelines or references for the use of RTI in their state legislation (CDE, 2009; Massachusetts Department of Elementary and Secondary Education, 2016; Special Education Code, 2016; Texas Education Agency, 2017; TSHA, 2009). Therefore, we expected that SLPs in these states would report practices that align with these state guidelines. For example, although slightly more SLPs in CA reported using RTI to treat SSDs, a large proportion also reported not using this system of intervention to treat these students. However, CA state guidelines note that “SLPs should expand their practice to incorporate prevention and identification of at-risk students who could benefit from speech and language-based intervention as part of the RTI process at the school” and that some SLPs are providing speech-only interventions through RTI to students with single-sound articulation difficulties (CDE, 2009). Nevertheless, the majority of SLPs from CA reported that they obtained their eligibility guidelines from state legislation. Therefore, it seems that the majority of SLPs in CA are obtaining their guidelines from the state legislation and following these guidelines but that a significant number of SLPs are receiving their guidelines from other sources, causing variability in the use of RTI.

In NJ, although state legislature provides guidelines for providing RTI to students with SLDs, there is no specific mention of using this method of service delivery for students with SSDs (Special Education Code, 2016). As a significant majority of SLPs in NJ reported not using an RTI framework to treat children with SSDs, it seems that the SLPs from this state are adhering to how the state of NJ has interpreted federal guidelines regarding RTI. As the vast majority of SLPs from NJ reported that their source of eligibility criteria for identifying students with SSDs was based on state guidelines, this provides further evidence that this may be a reason why so few SLPs in NJ are using RTI models when working with children with SSDs.

Similar trends were found in both MA and TX. In MA, state laws do not outline implementation of RTI any differently than what is included in federal legislation and give no specific guidance on how to implement such a system for children with SSD (Massachusetts Department of Elementary and Secondary Education, 2016). Thus, it was unsurprising that the majority of SLPs in MA reported that they did not use RTI to treat SSDs and that there was high variability in where they reported where they gathered their eligibility guidelines from for SSDs. The Texas Education Agency (2017) also did not specifically provide guidelines for treating children with SSDs through an RTI system; however, they provide a direct link to a set of guidelines created by the TSHA (2009), which discusses the use of RTI across a variety of communication impairments, including SSDs. The majority of SLPs in TX reported receiving their eligibility guidelines from TSHA, which supports the use of RTI for articulation and phonological disorders; this falls in line with the finding that the majority of SLPs in TX use RTI for treatment of SSDs and suggests that most SLPs in this state are following the guidelines provided by TSHA.

Overall, for each state that was examined in this study, SLPs tend to use their eligibility sources as a way to also determine whether or not they should use RTI to treat children with SSDs. Although it is known that federal education legislation can be reinterpreted at the state, district, and local school levels, there is a dearth of research to show from what level SLPs are obtaining guidelines for evaluation and treatment of their students. These results fill an important gap in the literature to show that there is a high level of variability between states as to where SLPs may obtain this information. The source of an SLP’s guidelines can dictate how they choose to identify, assess, and provide treatment to their students. Inconsistent interpretations of the laws regarding RTI place children with SSDs at risk of not being appropriately identified or treated and “falling through the cracks.” Thus, clear legislature is paramount to providing appropriate assessments and treatments to children with SSDs.
Limitations

The limitation of this study, noted below, should serve as factors that researchers should consider in planning other investigations on how communication disorders are addressed through RTI systems. First, only one categorical question in this survey explicitly addressed the use of RTI or other multilitered systems of intervention. As this question asked specifically about RTI for SSDs, there was no information available about the general use of RTI for other communication disorders or for SLDs. Furthermore, we were not able to examine what types of RTI systems were being used (i.e., informal or formal) and the extent to which this had an effect on students with SSDs being treated through either model. Second, several states had a very small representation (e.g., \( n = 1 \)), which made it difficult to interpret data at the individual state level and through regional groupings. Third, as we only had information about which state the SLP was working in, it was difficult to examine variability in interpretation of legislation at county or district levels. Next, as with most surveys, the participants in this survey may have chosen to participate based on their interest in SSDs. Therefore, we may be missing input from school-based SLPs who have different clinical interests and make different decisions about RTI. Nevertheless, these limitations provide opportunities for future research. For example, next steps may examine variability in interpretation of federal law regarding optional use of RTI at district and local levels to see to what extent this may affect an SLP’s ability to treat students with SSDs through this service delivery model. Future research should also examine the efficacy of formal and informal RTI programs that target speech sound production, measure student speech sound and literacy outcomes, and determine whether an SLP’s perceived workload affects the implementation of RTI models. Finally, analyzing qualitative information regarding SLPs’ perceptions of the categories evaluated in this quantitative study (years of experience, caseload size, source of guidelines) could improve the understanding of school-based SLPs’ thoughts regarding RTI.

Clinical Implications and Summary

The 2004 revision of IDEA permitted educators to use “a process based on the child’s response to evidence-based interventions” (IDEA, 2004a) without requiring the use of a severe discrepancy between intellectual ability and achievement to determine if a child has an SLD (IDEA, 2004b). However, children with SSDs may not be included in the criteria to qualify as having an SLD and, therefore, may or may not be treated through an RTI framework. There is a robust link between SSDs and later literacy outcomes, and identifying and treating these SSDs early and effectively could alleviate that impact of literacy disorders for these students. Indeed, it is current practice in many schools to not provide services—at all—to children with SSDs. Coupled with their risk for literacy impairments, this can cause many negative downstream effects. However, RTI offers an optional and short-term approach to service provision that may help to support children with SSDs before their impairment results in a persistent speech sound error and/or a reading deficit. Previous research has shown that using RTI for SSDs is effective and often a much more rapid process than placing the student on an IEP (Mire-Montgomery, 2009; Taps, 2008), and yet the legislation is vague regarding how to appropriately implement this system for students with SSDs. As caseload sizes increase in size, it is critical that SLPs and special educators advocate for their students with SSDs and for themselves. Using an RTI model for children with SSDs is not only beneficial to the student but can also benefit the clinician by reducing his or her caseload size (Taps, 2008) and preventing overidentification of students for IEPs. In advocating for students, SLPs should also question the ambiguity and inconsistency of the state, district, and local school legislature and rules regarding the use of RTI for students with SSDs. Exploring the inconsistency across different levels of government in the interpretation of the use of RTI could be an effective way to advocate for this population. Although there is some debate about whether RTI should be used for single-sound articulation disorders where there is no educational impact (Ehren, 2011), the vast majority of the literature has shown that these students are still at risk for developing academic, emotional, social, and behavioral difficulties (Daniel & McLeod, 2017; Overby, Carrell, & Bernthal, 2007; Farquharson, Hogan, & Bernthal, 2017). Furthermore, Pennington (2006) has suggested that the field move away from
dichotomizing SSDs into either articulation or phonological, as we often do not know the underlying cause. In addition, this dichotomization is problematic for the exact reasons raised in this study—we often do not know the underlying phonological skills of children with SSDs, particularly those with a single sound in error. Assumptions may be made that a single sound in error does not affect educational performance (Farquharson & Boldini, in press), but a robust and individualized assessment must be conducted to determine that. Although there may not be an educational impact at the time of initial assessment, the literature shows that, if left untreated, these risks can turn into realities. Even though RTI was initially intended as a method of service delivery for oral language and literacy disorders, when used to treat SSDs, it may be an effective method of prevention for later difficulties with literacy. However, it is important to remember that RTI is a system that cannot be implemented by one person alone. It is most effective when all members of school staff are well trained and working together to cohesively incorporate the model into both general and special education. Therefore, it is important for all school staff to advocate for the implementation of RTI for the benefit of the students at the school and provide appropriate services to those who need it, including students with SSDs.

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