

PHONOLOGICAL AWARENESS ASSESSMENT PRACTICES FOR CHILDREN
WITH SPEECH SOUND DISORDERS: RESULTS OF A NATIONAL SURVEY

A Master's Thesis

Presented to

The Faculty of the Department of
Communication Sciences and Disorders
University of Houston

In Partial Fulfillment

Of the Requirements for the Degree of
Master of Arts

By

Meghan Sharensen

May 2019

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ABSTRACT

The purpose of this study was to examine assessment procedures of phonological awareness skills by speech-language pathologists (SLPs) when evaluating children who have suspected or diagnosed speech sound disorders (SSDs), including children with isolated SSDs or SSDs with co-morbid communicative impairments (e.g. language, ADHD). A survey utilizing a variety of answer selection formats was administered using the online survey website Survey Monkey. A hyperlink to the survey was distributed through email sharing and through postings on the American Speech-Language-Hearing Association's (ASHA) network of Special Interest Groups (SIGs). Out of 202 collected responses from SLPs working in a variety of settings (e.g. public and/or private schools, private clinics), regarding the comorbidity of SSDs and reading problems, 90.10% of respondents indicated that they currently have students on their caseloads with SSDs and concomitant reading problems. Out of those respondents, 77.72% have assessed for phonological awareness skills in their students with SSDs. While a large majority of SLPs have assessed phonological awareness skills in their students with suspected or diagnosed SSDs, the actual frequency of such evaluations in relation to the overall population of children with both impairments is comparatively low. Overall, the survey respondents agree that speech and language impairments demonstrate reciprocal relationships with the development of literacy skills, with a significant majority of respondents agreeing that both domains are included within an SLP's clinical responsibilities as they relate to the development of communication skills, both oral and written.

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Dedication

This thesis is dedicated to my son, Wesley Sharensen for providing a constant reminder of my love for children and why I have worked so diligently to pursue a second career in Speech-Language Pathology. I also dedicate this thesis to my husband, Andrew Sharensen, who has accompanied me on this entire journey from post-baccalaureate to master's degree with patience, love, and most importantly, humor.

Phonological Awareness Assessment Practices for Children with Speech Sound Disorders: Results of a National Survey

Introduction

Speech sound disorders (SSDs) occur when a child has difficulties producing speech sounds and encompass both articulatory and phonological impairments. Articulatory impairments occur when a physical, structural, or motor deficit affects sound production (e.g. lateral or frontal lisp, cleft palate, or apraxia of speech). Phonological impairments occur when a child demonstrates a set of phonological processes, in which errors occur in patterns (e.g. deletion of final consonants, fronting of velar sounds) (Peña-Brooks & Hegde, 2015). SSDs affect an estimated range of 2 to 25% of early school-age children and can exist in isolation or with comorbid impairments such as language impairment (LI), autism spectrum disorders (ASD), attention-deficit-hyperactive-disorders (ADHD), or other communicative and/or social-pragmatic impairments (Hayiou-Thomas, Carroll, Leavitt, Hulme, & Snowling, 2017; Law, Boyle, Harris, Harkness, & Nye, 2000). An additional and sometimes clinically overlooked co-morbid impairment in a subset of children with SSDs concerns the presence of associated phonological awareness skill deficiencies which contribute to the impaired acquisition and development of literacy skills. The research literature suggests a link between SSDs and impaired reading development, specifically due to phonological awareness deficits which are associated with SSDs, thus demonstrating the need for assessment of phonological awareness skills in this population, particularly in educational settings (Bird, Bishop & Freeman, 1995; Bishop & Adams, 1990; Catts, 1993; Larrivee & Catts,

1999; Leitao, Hogben, & Fletcher, 1997; Preston and Edwards, 2010; Rvachew, 2007; Rvachew & Grawburg, 2006). However, assessments of phonological awareness skills are often not included in a standard speech and language assessment along with requisite formal measures of speech sounds and expressive and receptive language skills. An appropriate and accurate assessment of all pertinent areas is a crucial first step when determining an individual child's need for additional support services within the school setting in particular, whether such services concern speech, language, reading, or a combination of such skills.

Literature Review

The Academic Importance of Literacy Skills

Literacy skills in particular have the utmost academic relevance, particularly in the current American educational system, where early literacy is systematically considered fundamental for early and continued academic success throughout traditional school years and into higher education and adulthood (National Early Literacy Panel, 2008). Additionally, in the current educational climate in the United States, wherein the allotment of special education services in public schools is reliant upon the combination of standardized test scores within a specific range along with the educational relevance of associated impairments, appropriate assessment of educationally relevant skills becomes increasingly important for children who are in need of additional support both in and outside of the classroom (Special Education Rules and Regulations, 2017). Therefore, any insight that can be achieved regarding appropriate assistance and/or support for children who have difficulties with early reading development and associated precursory

reading skills will likely prove beneficial for early, effective, and continued remediation of such impairments.

The National Early Literacy Panel (NELP) of 2002 was formed in response to the Employment, Training and Literacy Enhancement Act of 1997, H. R. 1385 and the subsequent National Reading Panel (2000). The National Reading Panel was created for the purpose of evaluating literacy instruction with the goal of fostering greater reading achievement among students in American schools. However, the National Reading Panel did not examine scientific research regarding reading instruction for children from birth through the age of five, thus the NELP was convened in 2002 for this purpose. The fundamental goals of the NELP were to evaluate the available scientific literature in order to determine which educational approaches/programs, interventions, parental activities, learning environments, and child characteristics were associated with the initial development of as well as future outcomes in the areas of reading, writing, and spelling. The resulting National Early Literacy Panel Report (2008) detailed a core group of pre-literacy skills and abilities which contribute to the development and continued acquisition of literacy skills in the domains of decoding, reading comprehension, and spelling. The primary pre-literacy skills were as follows: alphabet knowledge, rapid automatic naming (RAN) of letters or digits, RAN of objects or colors, and writing. The two remaining core skills of phonological memory and phonological awareness are part of a larger skill set known as phonological processing, which is largely understood to be the underlying impairment in dyslexia and other reading disorders (Snowling & Melby-Lervåg, 2016). Phonological processing impairments can also be considered an associated characteristic of dyslexia which further exacerbates the risk for progressive reading impairments. It

should also be noted that phonological awareness, alphabet knowledge and RAN have been identified as robust predictors of reading skills in children with familial risk for dyslexia or other reading disorders (Anthony & Francis, 2005; Snowling & Melby-Lervåg, 2016). Phonological processing skills are of particular interest to this study because of their shared implications for both literacy development and the reciprocal development of speech and language. Throughout the literature, these six core skills outlined by the NELP demonstrated consistently robust correlations with the development and acquisition of more formalized reading abilities in the early school-age years. Additionally, the acquisition of these core skills was associated with future reading abilities even when factors such as IQ or socioeconomic status (SES) were taken into consideration. The NELP also described literacy skills which are moderately correlated with reading development, including the acquisition of oral language skills in both receptive and expressive domains, and which, like phonological processing abilities, share reciprocal implications between the areas of literacy instruction and speech-language pathology (National Early Literacy Panel, 2008).

Phonological Processing Skills and Literacy Development

Phonological processing abilities are necessary for the acquisition and continued development of literacy skills and include the subskills of phonological memory (storing coded sounds or phonological representations in short-term memory), phonological access to lexical storage (the ability to retrieve phonological representations from short-term memory), and phonological awareness, (the ability to process, differentiate, and manipulate sounds within words). These three skills demonstrate reciprocal relationships with each other and subsequently contribute to overall reading development, however,

phonological awareness has the closest association with literacy (Anthony & Francis, 2005).

Phonological awareness is viewed throughout the literature as an individual cognitive domain which begins to develop during the preschool and early elementary school years, even before children begin formalized literacy instruction (Snowling & Melby-Lervåg, 2016). Phonological awareness encompasses a number of smaller skills including but not limited to segmenting words into smaller individual or blended sounds, combining individual sounds into words, and comparing words in order to find phonemic commonalities. Other widely used aspects of phonological awareness include the perception, discrimination, and manipulation of syllables into onsets, consonants or consonant clusters which appear in the initial position of a word, and rhymes, which include the remaining vowel and consonants (Anthony & Francis, 2005; Anthony, Lonigan, Driscoll, Phillips, & Burgess, 2003; Schatschneider, Francis, Foorman, Fletcher, & Mehta, 1999).

Additionally, both expressive and receptive language play roles in phonological awareness development. Oral language affects phonological awareness due to the overall complexity of language in terms of phonotactics (the study of the rules regarding the construction and placement of viable phoneme sequences in a language), as well as morphologic and articulatory complexity, while exposure to written language during the onset of formal literacy instruction accelerates the acquisition of phonological awareness skills, providing additional support for early reading development (Anthony & Francis, 2005). The complementary relationship between the development of phonological awareness and literacy is further detailed in a benchmark study by Perfetti, Beck, Bell

and Hughes (1987), and in subsequent studies by Ziegler et al., (2007), and Choi et al., (2016). Perfetti et al. (1987) specifically demonstrated that learning letter names and their corresponding sounds assist in early reading development along with phonological awareness skills acquired prior to initial reading instruction. Furthermore, the beneficial effects of phonological awareness are the most potent when children are learning to associate letter sounds and names, while subsequent reading and writing skills also prove beneficial for continued phonological awareness growth.

Early phonological awareness skills have further implications for reading due to their predictive characteristics regarding future literacy development (Catts, 1993; Catts, Fey, Zhang, & Tomblin, 2001; Gellert & Elbro, 2017; Hogan, Catts, & Little, 2010; Myers & Robertson, 2015). However, it should also be noted that phonological awareness skills lose their potency for predicting future reading skills once children have grown beyond preschool and early elementary age. The role of phonological awareness diminishes further regarding effective remediation of reading difficulties as continued reading development becomes more reliant upon reading comprehension and language abilities than upon phonological awareness skills as children get older (Buil-Legaz, Aguilar-Mediavilla, & Rodriguez-Ferrero, 2015; Hogan et al., 2010; Skebo et al., 2013; Storch & Whitehurst, 2002). Therefore, early assessment and identification of phonological awareness deficits in the preschool and early elementary school years is essential for the optimization of such skills during intervention.

Reading Skills in Children with Isolated Speech Sound Disorders

Heterogeneity within the population of children with SSDs results in a number of views regarding children with isolated SSDs with no comorbid language or other

communicative disorders. Some research finds that children with isolated SSDs have reading skills within normal limits and that many of these children learn to read and write without difficulty, especially if their SSD resolves by the time formal literacy instruction begins and provided that they have adequate phonological awareness skills (Leitao et al., 1997; Nathan, Stackhouse, Goulandris, & Snowling, 2004; Peterson, Pennington, Shriberg, & Boada, 2009; Raitano, Pennington, Tunick, Boada, & Shriberg, 2004). In related studies, children with isolated SSDs demonstrated performance on early literacy tasks that was consistent with or in some cases above that of a typically developing (TD) control group and that only the presence of comorbid LI resulted in impaired performance in children with SSDs (Bishop & Adams, 1990; Catts, 1993; Peterson et al., 2009). However, it should be noted that while children with isolated SSDs in these studies performed on average at comparable levels to national normative scores, these children were still impaired in early literacy measures such as phonological awareness skills, letter-sound knowledge, and reading and writing of both real and non-words in relation to their typical age-matched peers (Bird et al., 1995; Larrivee & Catts, 1999; Lewis & Freebairn, 1992; Peterson et al., 2009). This variance may be explained by evidence that children with isolated SSDs and unimpaired and age-appropriate language skills still have poorer phonological awareness skills than their peers (Bird et al., 1995; Raitano et al., 2004; Rvachew, Ohberg, Grawburg, & Heyding, 2003). Additionally, phonological awareness impairments in children with isolated SSDs may in some part be accounted for by the reciprocal permeability between oral and written language growth and development, in that each domain has an effect, either positive or negative, upon the other. In other words, children with oral language impairments often have difficulties

with written language and reading and vice versa. With younger children in particular, the development of both reading and writing skills are influenced substantially by both preceding and concurrent oral language development (Hulme & Snowling, 2013). Additionally, children who present with an isolated SSD upon entering school may develop progressive language and/or literacy disorders, through which language and literacy skills become increasingly impaired over time, particularly in relation to typically developing peers. These progressive impairments develop even though some children with isolated SSDs present with developmentally appropriate language skills at the time of identification. These children initially perform at comparable levels to their age-matched peers on literacy measures, however, as evolving language and literacy skills become increasingly important for academic success, children with isolated SSDs may experience changes in these domains as schoolwork becomes more demanding and academic achievement is increasingly reliant upon comprehension skills more than upon basic word-decoding abilities (Farquharson, 2015).

Additionally, literacy skill acquisition in children with SSDs may appear as somewhat stagnant in relation to their peers, when in actuality, the reading abilities of children with unimpaired speech and language are growing quickly in correlation with increased reading skill demands, (e.g. a greater emphasis on reading comprehension and language skills than upon decoding and phonological awareness abilities as they grow older). Conversely, literacy skill development in children with SSDs can occur at a slower rate, thus increasing the disparity between individuals with SSDs and RD in comparison with their typical age-matched peers (Bird et al., 1995; Larrivee & Catts, 1999; Nathan et al., 2004). Therefore, without the implementation of appropriate literacy

intervention, reading abilities in children with SSDs remain impaired in relation to their typically developing peers, because the trajectory of their progressive reading development grows at a correspondingly slower rate. It is also worth mentioning that children who present with residual speech sound errors are more likely to experience increased social and emotional difficulties in addition to academic impairments in comparison with their typically developing peers. Such impairments may continue to have detrimental impacts upon activity participation and overall quality of life which persist into adolescence and adulthood. Furthermore, these difficulties are not restricted to children with more severe SSDs, and children who have milder disorders are still at risk for social, emotional, and academic impairments (Hitchcock, Harel, & McAllister-Byun, 2015; McCormack, McLeod, McAllister, & Harrison, 2007).

Similarly, children who present with more prevalent forms of SSDs, such as inconsistent or persistent speech production difficulties within isolated SSDs, perform comparably to controls on tests of early reading ability (Holm, Farrier, & Dodd, 2008; Peterson et al., 2009). However, while the research does not demonstrate significant differences between early reading performance by children with SSDs and controls, the presence of an isolated SSD still places these children at risk for difficulties with phonological processing skills and continued reading acquisition, due to poor emergent literacy skills (e.g. phonological awareness, RAN) (Bird et al., 1995; Carroll, Leavitt, Hulme, & Snowling, 2017; DeThorne, 2006; Hayiou-Thomas et al., 2017; Nathan et al., 2004; Raitano et al., 2004; Rvachew et al., 2003; Rvachew, Chiang, & Evans, 2007; Schuele, 2004).

Phonological Awareness Skills in Children with Speech Sound Disorders

Phonological awareness skills have implications for all children as they learn to read, however, there is a specific link between phonological awareness deficits, impaired literacy development, and SSDs which can often be overlooked in the overall context of speech and language impairment. The research literature provides some support for the relationship between SSDs, phonological awareness, and reading, therefore such evidence should be acknowledged when considering assessment and treatment options for younger children with suspected or identified SSDs, particularly in educational settings due to the significant role which reading plays in overall academic achievement (National Early Literacy Panel, 2008).

The most substantial amount of published research regarding phonological awareness and SSDs by far pertains to preschool and early school-aged children, most likely due to the fact that phonological awareness skills provide the most significant contribution to literacy development in these early years before children begin formalized literacy instruction (Catts et al., 2001; Lonigan, Burgess, & Anthony, 2000). Although the link between isolated SSDs and phonological awareness skills has been suggested throughout the literature, there is a notable amount of variability within the evidence regarding the strength of this relationship, particularly in relation to children who have isolated SSDs and no comorbid language impairment (LI). Significant variability within the literature is largely due to the distinct heterogeneity of the population of children with SSDs. Nevertheless, the literature generally reaches a consensus that not all children with SSDs have concomitant reading disability (RD), however, there are subsets within the larger population of children with SSDs who are at risk for impaired reading

development at least in part due to impaired phonological awareness skills (Bird, Bishop & Freeman, 1995; Bishop & Adams, 1990; Catts, 1993; Larrivee & Catts, 1999; Leita, Hogben, & Fletcher, 1997; Preston and Edwards, 2010; Rvachew, 2007). Similarly, it should also be noted that a significant amount of variability within the SSD population can be accounted for by phonological awareness skills and corresponding reading outcomes (Larrivee & Catts, 1999).

Variability regarding phonological awareness skills within the SSD population becomes increasingly evident when reading outcomes for children with SSDs are examined. Larrivee and Catts (1999) looked at the phonological awareness skills of two groups of children with SSDs, with good and impaired reading outcomes, respectively. The children with positive outcomes had significantly higher phonological awareness abilities than the reading disabled (RD) group, demonstrating that phonological awareness skills are correlated with reading performance. Phonological awareness deficits associated with SSDs may be explained in part by corresponding deficits in phonological representations which contain the speech sound structure of words along with semantics, letter-sound correspondence, and motor planning and execution for articulation (Anthony et al., 2010; Elbro, 1996; Fowler, 1991). A measure of support has been documented regarding phonological representation difficulties as a cause for impaired phonological awareness skills and subsequent RD in children with SSDs (Anthony et al., 2011; Bird et al., 1995; Catts, 2001; Holm et al., 2008; Leita & Fletcher, 2004; Preston & Edwards, 2010; Rvachew & Grawburg, 2006; Sutherland & Gillon, 2007). Because phonological awareness skills rely upon intact phonological representations, deficits in this domain have implications for both spoken language and

word decoding skills during early literacy acquisition (Lewis et al., 2011). Phonological representations have also been associated with receptive vocabulary skills because children with larger receptive vocabularies are considered to have more mature phonological representations from which to draw upon during reading tasks, therefore they have better phonological awareness skills than children with more impaired receptive language abilities (Metsala, 1999). The ability to access accurate phonological representations may also be predictive of future reading skills and may be difficult for children with SSDs due to impaired phonological working memory skills which hinders their ability to retrieve phonological representations from storage in long-term memory (Farquharson, 2012; Preston & Edwards, 2010; Sutherland & Gillon, 2007).

Just as receptive vocabulary skills are associated with more accurate phonological representations, the development, size, and organization of a child's vocabulary are directly related to phonological awareness skills. Typical vocabulary development causes the phonological lexicon to become more organized and allows for elementary school-aged children to acquire the ability to segment larger lexical structures into individual phonemes in order to assist with word decoding (Walley, 1993). Additionally, the size of a child's vocabulary relates to their phonotactic abilities, through which they learn to recognize phonemic patterns and sequences both within and between words. Strong phonotactic skills facilitate lexical acquisition and thus foster literacy development and have been associated with larger vocabularies in very young children (Graf Estes, Chen-Wu Gluck, & Grimm, 2016). Children who have impaired vocabulary development due to receptive and expressive LI are therefore more likely to have a disorganized phonological lexicon and associated difficulties with word segmentation which make

word decoding increasingly challenging. Further support for associations between phonological awareness and vocabulary was demonstrated by Metsala (1999), who found that kindergarten and first-grade children performed significantly better on phonological awareness tasks incorporating well-known words than on tasks utilizing less familiar or non-words. These results demonstrate that vocabulary development and phonological awareness, along with the ability to access accurate phonological representations, are foundational for the acquisition and continued development of reading skills.

Additionally, Geirut and Morrisette (2015) attribute lexical development to the organization of newly acquired words into dense and sparse neighborhoods. Dense neighborhoods are composed of words which share the same or similar phonological forms, while sparse neighborhoods contain words with little to no overlap of phonological form. The differentiation between these two types of neighborhoods becomes evident in typically developing children and children who have speech and/or language delays. Typically developing children are better able to organize lexical information into dense neighborhoods, thus facilitating better phonological processing skills, which subsequently helps them acquire literacy skills more readily than their speech-and-language-delayed peers (Geirut & Morrisette, 2012b; Geirut & Morrisette, 2015; Stoel-Gammon, 2011).

Further research on SSD and comorbid RD explores implications for severity and persistence of phonological impairments and subsequent effects upon reading development. Children with more severe SSDs demonstrate impaired reading outcomes along with poorer phonological processing and language skills when compared with children with less severe phonological impairments (Larrivee & Catts, 1999). Children

with more severe and/or persistent SSDs also have an increased risk for problems with literacy acquisition due to associated phonological awareness deficits and reading abilities which are comparable to those of children with phonological dyslexia, a literacy impairment which involves a greater impairment in reading of non-words in relation to reading of more commonly encountered words (Caccappolo-van Vliet, Miozzo, & Stern, 2004; Carroll & Snowling, 2004; Nathan, et al., 2004; Raitano et al., 2004; Rvachew et al., 2007; Webster & Plante, 1992).

Atypical speech errors demonstrated by children with SSDs are also associated with poor phonological awareness skills, reading impairment, and an increased risk for continued difficulty with literacy acquisition. Such errors may be representative of a deeper underlying impairment of cognitive-linguistic speech processing skills in this subset of children with SSDs which relates to problems in phonological awareness skills such as segmentation of words and identification and grouping of phonemes (Leitao & Fletcher, 2004). Children with non-developmental speech sound errors therefore demonstrate greater difficulty with phonological awareness and reading tasks than peers who present with more typical errors who, on average, perform at comparable levels to controls (Harris, Botting, Myers, & Dodd, 2011). Persistent non-developmental speech errors have also been associated with both early and persistent long-term phonological processing and literacy impairment, the effects of which are seen in younger school-aged children and on into early adolescent years. Additionally, atypical speech errors have been found to be more predictive of phonological awareness deficits from preschool age than typical speech sound errors and distortions, which are not correlated with phonological awareness skills. Furthermore, preschool speech error patterns have not

only been shown to predict school-age phonological awareness skills, but also literacy and articulation abilities four years later (Preston, Hull & Edwards, 2013). And as with many subsets of children with SSDs, weak underlying phonological representations in children have been associated with atypical speech sound errors and related phonological and reading impairments (Leitao et al., 1997; Leitao and Fletcher, 2004; Preston et al., 2013; Preston & Edwards, 2010).

As evidenced throughout the research literature, there is marked heterogeneity among the population of children with isolated SSDs in terms of persistence, severity, and the nature of speech sound errors (e.g. atypical/non-developmental). This evidence suggests that in order to avoid overlooking phonological processing deficits as risk factors and contributors to impaired reading development, all children with SSDs should be assessed for phonological awareness, or at the very least monitored and/or screened for potential problems. Additionally, distinct variability among these children makes differential diagnosis within the larger population of children with SSDs very difficult, therefore requisite testing of phonological awareness impairments should be employed for all of these children, regardless of concomitant language abilities (Dodd, 2014).

Speech Sound Disorders, Co-Morbid Language Impairment, and Reading Skills

A larger body of research is dedicated to SSDs and comorbid LI, which places children at the highest level of risk for reading impairment in comparison to children with either isolated SSDs or LI alone, likely due, at least in part, to a composite risk of phonological awareness deficits which are associated with both SSD and LI (SSD + LI) (Leitao et al., 1997; Raitano et al., 2004). It is also important to observe, as in children with isolated SSDs, that children with SSD + LI are a notably heterogeneous population,

and that such variations should be carefully considered when evaluating reading abilities within this population (Buil-Legaz, et al., 2015). Along the same lines, when evaluating SSD + LI, it is important to understand the contributions which LI alone has upon literacy development, just as the implications for SSD alone must be carefully observed. Children who are diagnosed with LI during their preschool years have an increased risk for RD, largely due to receptive and expressive language deficits. Receptive and expressive language impairments contribute to reading comprehension deficits and impaired word reading skills which become increasingly apparent in children throughout elementary school (Catts, 1993; Catts et al., 2002; Schuele, 2004). Additionally, children with language delay demonstrate significantly impaired reading comprehension in comparison with corresponding reading accuracy measures of their typical peers (Bishop & Adams, 1990).

Although LI undoubtedly provides a significant contribution to reading difficulties, additional research suggests that it does not entirely account for phonological processing impairments in children with SSDs, therefore SSDs continue to have some role in reading impairment, albeit a diminishing role over time (Bird et al., 1995; Rvachew et al., 2003). Children with SSD + LI are widely considered to be at a greater risk for RD and subsequent academic difficulties (Bishop & Adams, 1990; Catts, 1993; Schuele, 2004; Shriberg & Kwiatkowski, 1988; Sices, Taylor, Freebairn, Hansen, & Lewis, 2007). This increased risk for impairment can be attributed to findings by Catts (1993), Schuele (2004), and Skebo et al. (2013) that SSDs alone carry risk for phonological awareness impairment while LI adds further implications for reading comprehension, thus making children with SSD + LI substantially more likely to be

impaired. This combined and exacerbated risk becomes evident due in part to the consensus that phonological awareness skills are associated with word decoding skills while language abilities are more closely related to reading comprehension, therefore, children with SSD + LI experience problems across both domains, placing them at an increased disadvantage for early and continued literacy acquisition. Furthermore, word decoding and reading comprehension have a reciprocal relationship, in that each skill can have either positive or negative effects upon the other. Consequently, the whole impact of the two impairments when occurring simultaneously is essentially greater than the sum of the parts, which puts children at SSD + LI at a unique risk for difficulties in the acquisition and continued development of literacy skills. In addition to evaluations of SSD and LI as potential risk factors for RD, studies of reading outcomes for children with SSD + LI have demonstrated significant reading impairment in comparison to both controls and children with isolated SSD, largely due to the aforementioned composite deficits (Hayiou-Thomas et al., 2017; Skebo et al., 2013).

Furthermore, children with some form of LI typically have persistent problems with reading comprehension and decoding which continue into adolescence (Hall & Tomblin, 1978; Leitaio & Fletcher, 2004). Prevailing deficits and associated academic outcomes resulting from contributions of LI alone become more apparent over time as the impact of SSD and related phonological awareness deficits diminish as children grow older. Phonological impairments become less relevant for literacy growth in middle and late elementary years while language skills, such as depth and quality of vocabulary and syntactic abilities, become increasingly important due to their close relationship with reading comprehension (Silverman et al., 2015). Therefore, LI becomes more

problematic in later years by affecting both word reading and comprehension skills, which become increasingly important as children transition from basic word decoding and move into reading for comprehension and analysis around third grade (Hulme, Nash, Gooch, Lervåg, & Snowling, 2015; Storch & Whitehurst, 2002).

Buil-Legaz et al. (2015) offer a supplemental explanation for the increasing prominence of reading comprehension deficits over time in children with SSD + LI. As children with SSD + LI mature, word decoding abilities related to their SSDs/oral language impairments may improve because SSDs alone are often a primary target of earlier speech and language intervention. This is primarily due to the notion that SSDs are often the most overt impairment in children with SSD + LI early on. SSDs are particularly evident in younger children who have not yet begun formalized literacy instruction, when latent reading comprehension deficits due to language impairments cannot be identified (or remediated) at such an early stage in language and literacy development. Additionally, speech sound errors and word decoding abilities are relatively easier to remediate than reading comprehension deficits, because they can be targeted using drill and drill play activities suited to the needs, interests, and attention levels of younger children. In other words, SSDs and associated word decoding difficulties are often the more obvious impairment in younger children with SSD + LI and they are easier to identify and remediate than reading comprehension deficits, therefore they are more likely to be targeted consistently during therapy, and such skills are more likely to improve. This earlier focus on the remediation of SSDs and associated deficits causes reading comprehension difficulties associated with LI to become even more apparent when they initially manifest in middle elementary school (Buil-Legaz et al., 2015).

Long-Term Literacy Outcomes for Children with Speech Sound Disorders

Research that examines long-term literacy outcomes in relation to SSDs and deficits in early literacy skills is rare in comparison with studies of preschool and early school-aged children. The few studies that have examined the effects of childhood SSDs later in life have found that adolescents and adults who were diagnosed with SSDs as children continue to have impairments with receptive language and cognition into adulthood (Bird, 1995; Ciesla & Stein, 2013; Farquharson, 2015; Fletcher, 2004; Lewis & Freebairn, 1992; Skebo et al., 2013). Furthermore, these individuals continue to struggle academically in the domains of reading, writing, and oral language even after they have been dismissed from formal speech and language therapy. Such difficulties are likely due to underlying language impairments associated with SSDs. In congruence with younger children with non-developmental speech errors, adolescents who received earlier intervention for their atypical speech errors continue to perform significantly worse than their peers on measures of phonological awareness, reading comprehension, reading accuracy, and spelling (Farquharson, 2015). Similarly, adolescents who have residual or persistent speech sound errors have demonstrated continued deficits in phonological awareness and the ability to access accurate phonological representations, each of which have adverse effects upon reading accuracy, decoding, and spelling, as well as upon overall academic achievement (Johnson, Beitchman, & Brownie, 2010; Leitaio & Fletcher, 2004; Lewis & Freebairn, 1992; Nathan et al., 2004; Preston & Edwards, 2007). And finally, isolated SSDs have also been associated with long term negative effects on reading when literacy skills are measured in middle childhood (Lewis, Freebairn, & Taylor, 2002).

Long-term effects of SSDs and the implications for future reading skills and academic achievement throughout schooling further emphasize the need for early requisite assessment of phonological awareness skills along with speech and language abilities within the SSD population. Phonological awareness deficits are a more internalized impairment that may not be immediately evident due to the corresponding severity of more prevalent speech sound and/or language impairments. However, the small amount of research on long-term effects is clear. Phonological awareness impairments in early childhood may persist into adolescence and adulthood even when surface impairments such as speech sound errors have been resolved. Although phonological awareness skills diminish in influence regarding reading achievement over time, residual deficits in this domain continue to affect individuals if these skills have not been appropriately assessed and effectively remediated at an early age, when such skills are the most potent and relevant for literacy development.

Research Literature Support for Phonological Awareness Skill Assessment in Children with Speech Sound Disorders

Despite a number of studies detailing the relationship between phonological awareness deficits and associated reading difficulties in children with SSDs with or without comorbid communicative impairments, there is a relative paucity of explicit and/or substantial support for the requisite assessment of phonological awareness skills in these children. Support for phonological assessment is largely relegated to the conclusion section of research studies and is primarily limited to somewhat brief statements regarding clinical implications for such assessments. Anthony and Francis (2005) provide perhaps the most substantial support for phonological awareness assessment in

conjunction with testing of associated cognitive abilities and overall academic achievement. The authors acknowledge the significance of phonological awareness in reading development, therefore they advocate for the use of such assessments. Additionally, the authors assert that in order for an assessment to be as effective as possible at identifying children who are at risk for reading disabilities and determine developmentally appropriate interventions, phonological awareness measures should utilize skills that accurately correspond with an individual's current level of phonological development. If assessments are developmentally appropriate, then the prospects for early identification and subsequent intervention before formal reading instruction begins improving substantially. However, in light of such strong support for phonological awareness assessments by Anthony and Francis (2005), it should be noted in this particular article, the authors are referring to the larger population of children and reading disorders such as dyslexia, and not specifically to children with SSDs. Anthony et al. (2011) include SSDs along with other causes of reading impairment and provide a comprehensive list of reading-related skills which includes expressive phonology, speech perception, motor speech coordination, and phonological awareness. These skills should be included in interventions designed specifically for children with SSDs in concordance with associated deficits in reading development, therefore it is reasonable to conclude that such skills should also be part of a proceeding comprehensive assessment.

Research studies that advocate for phonological awareness assessment based upon findings from those same studies and specifically referring to the subset of children with SSDs with or without concomitant communicative impairments are relatively small in number compared to the total number of studies conducted regarding the link between

SSDs, LI, and impaired literacy development. Only a handful of studies distinctly support the inclusion of phonological awareness in a standardized testing battery for children with isolated SSDs. Preston and Edwards (2010) state that phonological awareness assessments for children with SSDs are not currently standard clinical practice, however, due to the well-established link between SSDs and reading impairment, assessment of phonological awareness skills should be included in a typical speech and language testing battery for all children with SSDs. Particular attention should be paid to children who present with unconventional speech sound errors who are more likely to have problems with phonological awareness skills. Similarly, Preston and Edwards (2007) support the inclusion of phonological processing testing as part of a comprehensive assessment for children and adolescents with residual speech sound errors in collaboration with evaluation by other educational professionals in order to achieve a complete picture of a child's phonological processing abilities as they relate to speech, language, and literacy.

Additional research provides somewhat less explicit, however still relatively substantial support for phonological awareness assessment in children with SSDs. Catts (1991) contended that phonological awareness assessment should be implemented by speech-language pathologists (SLPs) due to their academic knowledge and clinical experience regarding the development of speech and language skills in concordance with literacy development. Additionally, SLPs are fundamental to the early detection of phonological awareness deficits because they are often the first professional to identify speech and language impairments in children. Further support for phonological awareness assessment in Catts (1991) is illustrated by the author's suggestion that SLPs need to develop early identification protocols for children at risk for reading problems

such as criterion measures for phonological awareness skills which can be shared with classroom teachers and used in conjunction with similar measures for speech and language (Catts, 1993). SLPs may also play an important role in the identification of children who are at risk for progressive reading difficulties through determination of the severity of a child's expressive phonological disorder by using phonologically complex stimuli in an assessment of phonological processing abilities (as opposed to less complex, more common words used on a standard articulation assessment), along with measures of phonological awareness and language skills (Larrivee & Catts, 1999). Similarly, Grawburg and Rvachew (2007) place responsibility for early assessment and intervention of phonological awareness skills on SLPs due to their specific clinical expertise. Furthermore, early testing of phonological awareness deficits in children with SSDs is critical in order for early and appropriate intervention of such skills to be effective and that developmentally appropriate interventions addressing phonological awareness and letter knowledge should be initiated as soon as possible after phonological deficits have been identified to ensure that treatment is effective. Further support for assessment is evidenced through the close relationship between speech, language and literacy domains, which demonstrates that phonological awareness testing can easily be incorporated into a typical speech and language assessment battery (Grawburg & Rvachew, 2007; Nathan et al., 2004).

Additional research provides support for phonological awareness assessment in children with SSDs to varying degrees. Rvachew and Grawburg (2006) and Rvachew (2007) and both provide support for the early assessment of phonological processing difficulties in preschool-aged children through the use of speech perception, receptive

vocabulary, emergent literacy skills, and phonological awareness tasks. Furthermore, the implementation of progressive reassessments of literacy growth and achievement in children with early identification of SSDs would be advisable, primarily if such skill impairments are identified before the child begins kindergarten. Identification of such deficits in children indicating an increased risk for reading impairment can occur as early as 3 ½ years of age (Puolankanhaho et al., 2007).

Rvachew et al. (2003) argue that preschool children should be carefully monitored for signs of phonological awareness deficits so that school SLPs can be aware of such impairments as soon as a child enters kindergarten. Furthermore, screening of phonological awareness skills in children with expressive phonological delays should be implemented even when a child does not present with an associated delay in language development. Hayiou-Thomas et al., (2017); Macrae, Tyler and Lewis (2014); Preston and Edwards (2013); Rvachew (2007); and Rvachew et al. (2007) all support closely monitoring children with SSDs who have an increased risk for phonological awareness deficits and reading difficulties throughout the early stages of reading development. Additional monitoring of children with SSDs through the use of weekly assessments within a response to intervention model (RTI) which integrates periodic assessment along with the remediation of alphabet knowledge and phonological awareness skills can also foster growth in the early stages of literacy development (Kruse, Spencer, Olszewski, & Goldstein, 2015). Similarly, screening tools which include phonological awareness skills may be utilized periodically for children with phonological disorders (Webster & Plante, 1992).

Skebo et al. (2013) recommend routine re-evaluation for children with SSDs with or without LI, while Holm et al. (2008), Nathan et al. (2004), Leita0 and Fletcher (2004), and Sices et al. (2007) briefly address the value of early assessment for the identification of children with phonological awareness deficits so that appropriate intervention programs designed for the remediation of future reading difficulties can be administered effectively. Similarly, Fletcher (2004) and Leita0 and Fletcher (2004) support the assessment of phonological processing skills (including phonological awareness skills) along with speech testing as a precursor to intervention. Support for dynamic phonological awareness testing is provided by Gellert and Elbro (2017), who concluded that this form of phonological awareness assessment may predict early reading skills, however, they question the use of dynamic assessments, citing reasons such as the need for extra time and resources required for effective administration of dynamic assessments as opposed to more standardized forms of phonological awareness testing.

The lack of research support for the assessment of phonological awareness skills in children with SSDs becomes evident in a national survey regarding assessment practices of SLPs for children with possible SSDs conducted by Skahan, Watson, and Lof (2015). Within the survey, the authors provided a list of typically used standardized phonological assessments and participants were instructed to indicate which tests they have used and the corresponding frequency of such use (e.g. always, sometimes, infrequent, never). However, there was no inclusion of any standardized measures of phonological awareness among the answer choices. Similarly, a corresponding list of components of phonological assessment did not include any informal measures of

phonological awareness, with only phonemic awareness listed as the most closely related correlative skill.

American Speech-Language-Hearing Association (ASHA) Position Statements Regarding Reading and Writing in School-Aged Children

The American Speech-Language-Hearing Association (ASHA) has issued two position statements regarding the roles and responsibilities of SLPs concerning reading and writing in school-aged children. The ASHA 2001 statement exclusively addresses reading and writing skills and provides support for the inclusion of literacy intervention within the context of speech and language therapy. The statement describes the role of SLPs as essential in the development of both receptive and expressive forms of written language in students with speech, language, and communication impairments across various abilities and disorders. Additionally, the role of the SLP in literacy development is not singular and therefore requires collaboration with other educational professionals who contribute to literacy development by applying their own knowledge and experience in cooperation with the SLP and other members of the reading intervention team.

Specific roles and responsibilities regarding reading and writing designated to SLPs according to ASHA's 2001 position statement which supports the SLP's unique role in both assessment and collaborative intervention of reading and writing difficulties in the context of speech and language impairments include a) support of early language as a means of preventing written language difficulties in school; b) advocating with parents and teachers regarding exposure to and support for early literacy practices; c) screening for reading and writing deficits; d) assessment and data gathering regarding reading and writing performance in school; e) applying diagnoses of language-based

reading and writing deficits; f) designing treatment plans which address reading and writing in the context of speech-language pathology; g) providing treatment for reading and writing deficits in the context of speech-language pathology; and h) consulting with general education teachers to maximize success for children with speech and language impairments with comorbid reading and writing deficits in the classroom.

Furthermore, the 2001 ASHA position statement provides support for the inclusion of SLPs in collaborative literacy intervention by illustrating the relationships between both spoken and written forms of expressive language as they relate to the growth of reading and writing skills. These significant relationships include the concept that oral and written language are foundational for the acquisition of reading and writing skills and that the two domains have reciprocal effects upon one another, for example, gains in one area facilitate gains in the other. However, it should be carefully noted that the interrelations between oral and written language may also exacerbate impairments, for example, reading and writing impairments may also compound difficulties with language production and/or comprehension, awareness of language, and use of language for communication, thinking, and learning. Further associations include the prevalence of oral language from infancy and throughout a child's formal education and the observation that children who struggle with reading and writing often have language impairments, while children with language disorders often have difficulties with reading and writing. Additionally, direct support of writing skills plays an important role in fostering the development of oral language, while, in turn, explicit support for spoken language fosters the development of written language skills.

The 2010 ASHA position paper from is a more comprehensive statement of professional issues which addresses the entire scope of roles and responsibilities of SLPs in educational settings and presents reading and writing as a subheading within a larger clinical context. The statement stipulates a core group of fundamental roles for school-based SLPs which includes support of literacy growth and associated academic progress in the context of speech and language development. ASHA's 2010 position paper also reiterates positions regarding the role of SLPs described in more detail in the 2001 ASHA statement, citing the reciprocal relationship between speech, language and written forms of communication as well as the responsibility of SLPs to assist with literacy remediation in students with communication impairments and/or learning disabilities in collaboration with other educational professionals.

In addition to expertise in speech and language development and corresponding associations with reading development, SLPs have a unique role regarding assessment. Speech and language services in the schools are typically administered in group settings due to large caseloads, however, speech and language assessments are conducted individually. This gives the SLP a unique opportunity to provide individualized testing which includes both formal and informal measures of phonological awareness skills along with oral speech and language measures. Such individualized testing will likely not occur in the general classroom setting, simply due to multiple demands upon the general education teacher's time and resources, therefore phonological awareness testing administered by the SLP is more likely to identify any phonological processing deficits that could be overlooked in the general education classroom.

Research Questions

The goal of this research study was to evaluate current assessment practices of phonological awareness skills by SLPs. Seven questions guide this investigation.

Research Question #1: What percentage of students with SSDs also have reading problems as reported by SLPs?

Hypothesis: There is a high percentage reported of students with SSDs and co-morbid reading problems.

Research Question #2: How often do SLPs working with students with SSDs assess for phonological awareness skills in this population?

Hypothesis: The frequency of evaluation of such skills by SLPs is low in comparison with reported incidence rates of SSDs and comorbid reading impairments.

Research Question #3: Does a greater incidence of reading problems associate with use of phonological awareness assessment?

Hypothesis: SLPs who have a higher caseload of children with SSDs and reading difficulties are more likely to assess for phonological awareness skills as part of their typical test battery for this population.

Research Question #4: How do suspected reading problems influence an SLP's course of action for assessments?

Hypothesis: Clinicians who suspect reading problems in children with SSDs are likely to assess in additional areas such as phonological processing, as well as providing referrals

and participating in consultations with general education teachers, reading specialists, administrators, and parents.

Research Question #5: How does the year a Master's Degree in Communication Sciences and Disorders was obtained associate with reported knowledge of the 2001 ASHA position statement and frequency of assessment of phonological awareness skills in children with SSDs?

Hypothesis: Clinicians receiving their degrees in 2001 or later, and who are familiar with or have read the position statement, are more likely to assess for phonological awareness skills for children with SSDs.

Research Question #6: In which settings have SLPs received training in conducting assessments of phonological awareness skills?

Hypothesis: SLPs have received training in phonological awareness assessments in a variety of settings.

Research Question #7: What percentage of SLPs believe that reading and writing fall within their scope of practice?

Hypothesis: A significant number of SLPs do not believe that reading and writing are within their scope of practice, therefore they would be less likely to assess for phonological awareness skills for children with SSDs.

Method

Survey Development

The survey was developed in conjunction with a literature review of the currently available research regarding the link between speech-sound disorders (SSDs), phonological awareness, and literacy development, as well as a review of research support for assessment of phonological awareness skills in children with SSDs. The literature review involved a systematic search of research studies in peer-reviewed journals and periodicals. The survey was composed at the University of Houston and was largely based upon the 2001 position statement of the American Speech-Language-Hearing Association (ASHA) regarding the roles and responsibilities of SLPs concerning reading and writing in school-aged children (ASHA, 2001). The work of Skahan, Watson, and Lof (2007), was also utilized as a guide for content and format.

The survey consisted of thirty-two questions presented in multiple-choice, fill-in-the-blank, true/false, yes/no, and chart selection formats. Introductory questions concerned demographic information of the participants in areas of education, clinical experience, and occupational settings. The main body of the survey pertained to the assessment practices of SLPs working in educational settings as they relate to children with SSDs, more specifically in the areas of reading, writing, and phonological awareness skills. Additional questions involved Likert-type scales and a chart format in order to measure participants' frequency of use of commercially available standardized assessments for phonological and phonemic awareness skills. The final portion of the survey addressed the 2001 ASHA position statement regarding SLPs' roles and responsibilities concerning reading and writing (ASHA, 2001) in order to obtain

information on SLPs' views regarding scope of practice and the inclusion of reading and writing assessments and interventions within the roles and responsibilities of SLPs.

The survey was administered using the online survey website Survey Monkey, and was distributed through email sharing as well as through postings on ASHA's network of Special Interest Groups (SIGs). Two SIG groups were deemed appropriate forums for distribution of the survey. SIG 1 involves Language Learning and Education and SIG 16 concerns School-Based Issues. Appropriate permissions were obtained from the discussion board moderators before posting the survey in the SIG group forums.

All potential participants, whether receiving the survey directly through email, or by viewing a SIG online forum post, received access to a recruitment letter explaining the research study and its approval by the Institutional Review Board (IRB) at the University of Houston. The recruitment letter provided an active link to the survey on the Survey Monkey website. Upon opening the survey link, participants indicated consent before proceeding to the survey itself. If participants did not consent to participate in the survey, the survey was terminated.

Respondent Demographics, Education, and Experience (both overall and specific to children with SSDs)

Participants' practice setting, years of experience in licensed practice (both overall and specific to services provided to children with SSDs), and estimated percentage of students with SSDs currently part of caseloads are detailed in Tables 1-5. Multiple responses were allowed regarding practice setting in order to allow for the inclusion of individuals who work part-time in more than one setting. The majority of respondents provide full-time services in the public-schools and a wide range of

experience levels was noted both overall and specifically for children with SSDs.

Caseload percentages dedicated to children with SSDs (see Table 5) were also quite variable.

Table 1. Participants' practice setting ($N = 206$), multiple responses accepted

Practice Setting	<i>n</i>	%
Public school full-time	126	61.84%
Public school part-time	25	12.08%
Private school full-time	5	2.42%
Private school part-time	2	0.97%
Private clinic full-time	10	4.83%
Private clinic part-time	19	9.18%
Other	35	17.39%

Tables 2 and 3 address the respondents' overall years of clinical experience as licensed SLPs and experience specific to children with SSDs.

Table 2. Number of years in practice as a licensed speech-language pathologist ($N = 206$)

Reported years of experience	<i>n</i>	% of total respondents
0-5 years	20	9.71%
6-10 years	43	20.87%
11-15 years	29	14.08%
16-20 years	26	12.62%
21-25 years	15	7.28%
26-30 years	32	15.53%
30+ years	41	19.90%
<i>Mean years of experience = 19.49</i>		<i>SD = 11.75 years</i>

Table 3. Number of Years providing services for children with SSDs (N = 206)

Reported years providing services for SSDs	<i>n</i>	% of total respondents
0-5 years	28	13.59%
6-10 years	43	20.87%
11-15 years	31	15.05%
16-20 years	28	13.59%
20-25 years	19	9.22%
26-30 years	26	12.62%
30+ years	31	15.05%
<i>Mean years of experience = 18.22</i>		<i>SD = 11.32 years</i>

Additionally, because the survey was largely based upon the 2001 ASHA position statement regarding roles and responsibilities for SLPs concerning reading and writing, the year degrees were obtained should be considered in relation to publication of the statement (see Table 4). Responses indicating the year Master's Degrees were obtained were received from 186 of the 206 total survey respondents. Twenty participants only supplied the field of study and omitted the year of graduation which was requested within the survey. Educational demographics of the participants were roughly even between those who received degrees before and after the publication of the position statement in 2001, with a majority of respondents receiving their degrees prior to publication of the statement.

Table 4. Year of Degree Obtained in Relation to Publication of the 2001 ASHA Position Statement: Roles and Responsibilities of Speech-Language Pathologists with Respect to Reading and Writing in Children and Adolescents ($n = 186$)

Year Master's Degree Obtained	Frequency	%
Pre-position statement	106	56.99%
Post-position statement	80	43.01%
Total	186	

Table 5. Percentage of caseloads consisting of children with SSDs ($N = 206$)

Estimated % of SSDs on caseload	n	% of total responses	Estimated % of SSDs on caseload	n	% of total responses
0-9%	11	5.34%	50-59%	35	16.99%
10-19%	20	9.71%	60-69%	17	8.25%
20-29%	28	13.59%	70-79%	27	13.11%
30-39%	17	8.25%	80-89%	21	10.19%
40-49%	20	9.71%	90-100%	10	4.85%
				$M = 46.84\%$	$SD = 26.02\%$

The survey received a total of 214 responses with 207 participants (96.73%) indicating that they currently have students with SSDs on their caseload. Of the remaining seven participants (3.27%) who are not currently working with SSDs, five of these seven participants (2.34%) did not indicate clinical experience with SSDs. The two remaining respondents skipped this question. Subsequently, these seven responses were excluded because they were not based upon current practices of assessment of children with SSDs, which is the focus of this particular study. One additional response was

omitted because several of the participant's responses regarding frequency of assessment were deemed anomalous in comparison to those of the remaining sample. For example, when indicating numerical frequency of use for standardized phonological awareness assessments, this respondent indicated using a particular test more than 200 times, while all other participant responses were recorded at 100 times or less, with the majority between 20 and 50 times administering the assessment. The number of 200 administrations for this test was considered an outlier which could skew the study results and facilitate inaccuracies in data interpretation which may not be truly representative of the study sample, therefore the response was omitted. This last omission brought the final total number of respondents to 206.

Results

Research Question #1: What percentage of students with SSDs also have reading problems as reported by SLPs?

This first research question incorporates responses from two specific survey questions, concerning the incidence of SSDs and comorbid reading impairments on current caseloads. The first survey question asked if respondents have students on their caseloads with SSDs and concomitant reading problems, wherein 90.10% of respondents indicated that they currently provide services for such students, while 9.90% of respondents currently do not. The second survey question collected responses regarding estimated caseload percentages of children with both SSDs and reading impairment (see Table 6). Out of the total 206 respondents, 179 provided current percentage estimates. A strong correlation ($r = 0.82$) was found between the respondents' overall years of clinical

experience as licensed SLPs and experience specific to children with SSDs (see Tables 2 and 3).

Table 6. Percentage of children with both SSDs and comorbid reading difficulties (RD) in relation to the total number of students with SSDs on current caseloads ($n = 179$)

Estimated % of SSDs with RDs on caseload	<i>n</i>	% of total respondents
0-9%	25	13.83%
10-19%	21	11.70%
20-29%	36	19.15%
30-39%	21	11.17%
40-49%	10	5.32%
50-59%	30	15.96%
60-69%	6	3.19%
70-79%	11	9.57%
80-89%	12	7.98%
90-100%	7	2.13%
<i>M</i> = 36.35%		<i>SD</i> = 26.22%

Responses detailing caseload percentage estimates of children with both SSDs and reading impairment were distributed into 10-percentage-point ranges, with the largest number of respondents (36; 19.15%) indicating that 20-29% of their students with SSDs also present with reading impairments in relation to their entire caseload of students with SSDs. However, the entire distribution of responses ranges between 0-100% of children presenting with both impairments, indicating a marked amount of variability within these groups on current caseloads.

Research Question #2: How often do SLPs working with students with SSDs assess for phonological awareness skills in this population?

A substantial portion of SLPs have assessed for phonological awareness skills for their students with SSDs and reading impairment at some time during their clinical practice to date (see Table 7). Responses from five participants who cited referrals to other educational professionals (e.g. general education teacher, educational diagnostician, or school psychologist) for additional assessments outside the typical areas of speech and language in an associated open-ended response question were omitted from this data set.

Table 7. Phonological Awareness Assessment Use ($n = 201$)

Value	Frequency	%
Yes	157	77.72%
No	44	21.78%
Total	201	

The use of specific assessments and the frequency of administration were examined through the use of a checklist/table by which respondents were asked to indicate which standardized phonological awareness assessments they have administered as well as the frequency of use (e.g. Always, Sometimes, Infrequently, or Never), (see Table 8). Responses were provided by 161 participants (45 participants declined to provide answers). Additionally, some respondents provided a numerical estimation of use of individual assessments throughout their careers to date. The Comprehensive Test of Phonological Processing (CTOPP/CTOPP-2) was by far the most frequently administered assessment, with 31 respondents always using the CTOPP/CTOPP-2 and 49 respondents

sometimes using the CTOPP/CTOPP-2. It is also interesting to note that the number of “always use” and “sometimes use” responses drop off significantly for other assessments, beginning with the Phonological Awareness Test (PAT), which was “always” used by 8.28% (12) participants, and “sometimes used” by 24.82% (36) participants. None of the remaining 13 assessments had more than 3% of respondents reporting frequent use.

Table 8. Standardized Assessments, Frequency of Use, and Estimated Number of Times Administered (*n* = 161), multiple responses accepted

Assessment	Always use	Sometimes use	Infrequently use	Never use	Total	Aggregate # of users
Comprehensive Test of Phonological Processing (CTOPP or CTOPP-2)	31 19.87%	49 31.41%	31 19.87%	45 28.85%	156	111
Phonological Awareness Test (PAT)	12 8.28%	36 24.82%	22 15.17%	75 51.72%	145	70
Test of Phonological Awareness (TOPA)	2 1.41%	15 10.56%	23 16.20%	102 71.83%	142	40
Woodcock-Johnson III Diagnostic Reading Battery, Sound Awareness Subtest	0 0.00%	16 11.76%	14 10.29%	106 77.94%	136	28
Phonological Awareness Profile (PAP)	2 1.46%	9 6.57%	14 10.22%	112 81.75%	137	25
Woodcock-Johnson III Diagnostic Reading Battery, Word Attack Subtest	1 0.76%	12 9.10%	11 8.33%	108 81.81%	132	24

Assessment	Always use	Sometimes use	Infrequently use	Never use	Total	Aggregate # of users
Test of Phonological Awareness Skills (TOPAS)	0 0.00%	8 6.07%	9 6.82%	115 97.12%	132	18
Phonological Awareness Literacy Training (PALS) Pre-K	0 0.00%	4 2.86%	11 7.86%	125 89.29%	140	15
Phonological Awareness Literacy Training (PALS) K	0 0.00%	4 2.94%	9 6.62%	123 90.44%	136	13
Test of Early Reading Ability (TERA)	0 0.00%	3 2.21%	9 6.62%	124 91.18%	136	12
Phonological Awareness Literacy Training (PALS) Grades 1-3	0 0.00%	3 2.24%	8 5.97%	123 91.79%	134	11
Phonological Awareness Skills (PASS)	1 0.75%	6 4.48%	3 2.24%	124 92.54%	134	10
Pre-Literacy Skills Screening (PLSS)	0 0.00%	5 3.68%	4 2.94%	127 93.38%	136	9
Phonological Print and Awareness Scale (PPA)	0 0.72%	1 0.73%	8 5.84%	128 93.43%	137	9
Test of Phonological Awareness- Kindergarten (TOPA-K)	0 0.00%	2 1.56%	4 3.13%	122 95.31%	128	6
Total	161					

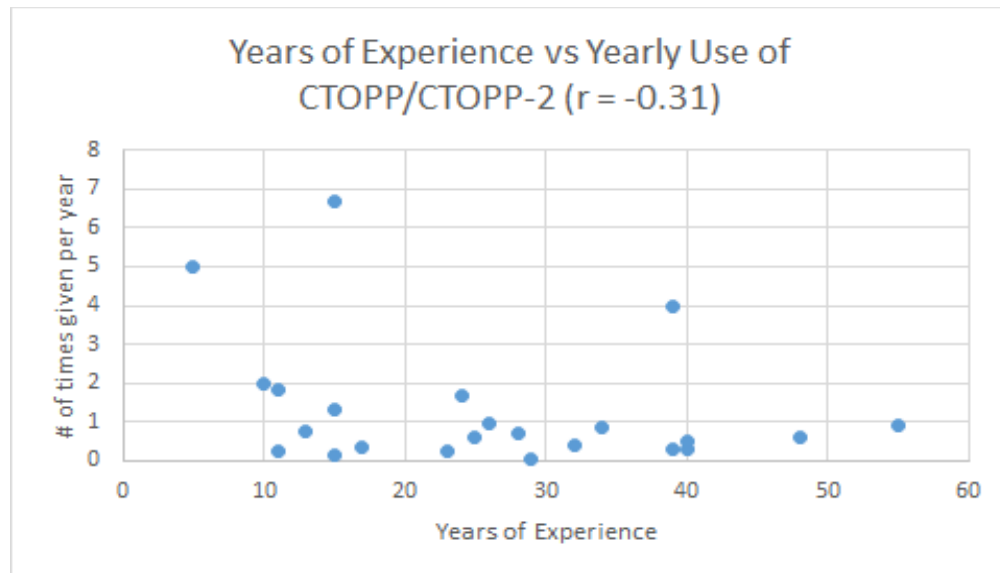
Individual responses concerning the estimated number of times specific assessments have been given were both sporadic and variable; for example, the Comprehensive Test of Phonological Processing (CTOPP/CTOPP-2) received a wide range of responses within the “always use” frequency category alone. Of the 31 participants who answered that they always use the CTOPP/CTOPP-2 for phonological awareness assessments, 18 respondents provided additional numeric responses. Such responses ranged between 11-100 times total administering the CTOPP over the course of a career, with the majority of responses ranging between 11-50 times total (see Table 9).

Table 9. Usage of CTOPP/CTOPP-2 per Entire Career to Date (*n* = 18)

CTOPP use	# of times administered across career	Years experience with SSDs	CTOPP use	# of times administered across career	Years experience with SSDs
Always	11	40	Always	25	26
Always	12	32	Always	25	5
Always	12	39	Always	30	19
Always	15	32	Always	30	29
Always	20	11	Always	40	18
Always	20	15	Always	50	55
Always	20	10	Always	100	15
Always	20	40	Always	4 x per year	25
Always	20	32	Always	30% of the time	38

Responses regarding years of experience working with SSDs and number of times the CTOPP was administered per year were also compared. No direct correlation between years of experience and number of times the CTOPP was given was found ($r = -0.31$, see Figure 1).

Figure 1. Yearly Use of CTOPP/CTOPP-2 vs Years of Clinical Experience



Aggregate scores for each test were also examined in order to compare clinician preferences for the 15 available phonological awareness assessments (see Table 8). The CTOPP/CTOPP-2 was by far the most administered test, with 111 respondents citing use of the test at some point in their careers. CTOPP/CTOPP-2 usage was followed by the Phonological Awareness Test (PAT) with 70 users and the Test of Phonological Awareness (TOPA) with 40 users. The remaining 12 assessments ranged between 8-28 users (0-10% of respondents) across the categories of “always use”, “sometimes use”, and “infrequent use”. When comparing the aggregate scores to the number of total responses, the percentage of respondents using the CTOPP to assess phonological awareness skills, for example, is somewhat promising (68.94%). However, when considering aggregate scores for the remaining assessments, the numbers demonstrating usage are much lower, ranging between 3.73% and 43.47%. These numbers indicate that the frequency of use of the variety of standardized assessments is relatively low, especially considering the percentage of SLPs who work with students with SSDs and

comorbid reading problems as indicated by this study (90.10%). It should also be noted that these aggregate scores include responses of “sometimes” and “infrequent” use of such assessments, meaning that the frequency of use is likely even lower.

Aggregate scores and “always use”, “sometimes use”, and “infrequently use” responses concerning the use of standardized phonological awareness assessments were also compared with a yes/no question addressing phonological awareness assessment, as well as an open-ended response question regarding additional assessments for children with SSDs as a cross-check measure. With a handful of exceptions, individual respondents provided consistent answers to all three questions. Specifically, if a respondent indicated “yes”, they do assess for phonological awareness, there was corresponding evidence regarding use of informal phonological awareness assessment as described in an open-ended response and/or an indication of an “always”, “sometimes”, or “infrequent” use response concerning the use of specific standardized assessments. There were three exceptions where respondents responded “yes” to phonological awareness assessment, and indicated that phonological awareness assessment is an additional area of interest for children with SSDs. However, these three respondents provided either no answers at all or only “never use” answers regarding use of specific standardized assessments. These responses may indicate that these clinicians use informal phonological awareness tasks or screeners for their students with SSDs or refer phonological awareness assessments to other professionals within the educational setting, among other options.

Research Question #3: Does a greater incidence of reading problems associate with use of phonological awareness assessment?

Reported percentages of children with SSDs currently found on caseloads were compared with yes/no responses regarding general use of phonological awareness assessments, either formal or informal. Surprisingly, clinicians who responded that they have not assessed for phonological awareness skills (23.42%) showed wide variability in their reports of the number of children on their caseloads who also have difficulties with reading. Responses regarding percentages of children with SSDs and co-morbid reading impairments by clinicians who have never assessed phonological awareness skills ranged between 3% and 80%. Additionally, ten of these clinicians (27.03%) report having a higher percentage (50% to 80%) of their students with SSDs presenting with co-morbid reading impairments. Respondents who have assessed phonological awareness skills reported between 1% and 100% of their students with SSDs having concomitant problems with reading. Fifty-three of these clinicians (43.80%) who have assessed for phonological awareness skills report having a higher percentage (50% to 100%) of children with SSDs and reading impairments on their caseload.

Research Question #4: How do suspected reading problems influence an SLP's course of action for assessments?

Respondents were asked two questions concerning their course of action for assessments of their students with SSDs and comorbid reading difficulties. Just over half (53.09%) of the 194 respondents for this question (twelve respondents declined to provide an answer) indicated that they do perform additional assessments for these children, while 46.91% of respondents replied that they administer no further testing

beyond traditional speech and language measures. Specific areas addressed by these additional assessments are illustrated in Table 10. Open-ended responses were provided by 114 participants (the remaining 92 participants declined to provide answers), with multiple areas cited within each response. Phonological awareness skills were cited most frequently, along with language. (The five previously mentioned responses regarding referrals to other professionals for reading-related issues have been omitted).

Table 10. Additional Assessment Areas for Children with SSDs and Comorbid Reading Impairments (*n* = 114), open-ended responses, multiple responses accepted

Value	Frequency
phonological awareness	42
language	42
reading	18
phonological processing	11
phonemic awareness	9
Vocabulary, auditory processing/comprehension, writing, TILLS (Test of Integrated Language and Literacy Skills)	4
phonological "skills", spelling, rapid naming, decoding	3
Hearing, narrative language	2
basic concepts, rhyming, nonword reading, sound/letter correspondence, orthographic knowledge, morphological knowledge, phonological memory, WASI (Wechsler Abbreviated Scale of Intelligence), auditory memory, memory, LAC (Lindamood Auditory Conceptualization Test), speech discrimination	1
Total Individual Open-Ended Responses =	114

The question of phonological awareness assessment is addressed more directly in a subsequent question which asks if respondents have ever assessed for phonological awareness skills in any of their students with SSDs. A significant majority of respondents (77.72%) answered “yes” and compared with 21.78% answering “no”, with the five participants previously noted for referring reading difficulties to other specialists omitted

from this particular question in order to provide a more accurate representation of current assessment practices.

Research Question #5 How does the year a Master's Degree in Communication Sciences and Disorders was obtained associate with reported knowledge of the 2001 ASHA position statement and assessment of phonological awareness skills in children with SSDs?

Years in which Master's Degrees in Communication Sciences and Disorders were earned were compared with both knowledge of the 2001 ASHA position statement addressing the roles of speech-language pathologists in reading and writing and respondents' performing phonological awareness assessments for their children with SSDs. For respondents receiving their degrees prior to and including the year 2001 and who have read the 2001 ASHA position statement ($n = 49$), 43 (87.76%) have assessed for phonological awareness skills for children with SSDs, and 6 have not. For respondents graduating 2002 and later ($n = 26$) who have read the statement, 17 (65.34%) have assessed phonological awareness skills and 9 have not. These results show that clinicians who have read the statement and received their degrees prior to publication of the 2001 statement are more likely to have assessed for phonological awareness skills.

Research Question #6: In which settings have SLPs received training in conducting assessments of phonological awareness skills?

Respondents were asked in which settings they have received training in the administration of phonological awareness assessments (see Table 11). Multiple responses were accepted and a majority of respondents indicated that they have received training in

one or more settings. The majority of the 185 respondents (21 respondents declined to answer) received training concerning phonological awareness assessment from continuing education units (CEUs) (67.57%) and in graduate level courses (66.49%).

Table 11. Educational Settings Providing Phonological Awareness Assessment Training (*n* = 185), multiple responses accepted

Educational Setting	Frequency	%
Continuing education units (CEUs)	125	67.57%
Graduate level courses	123	66.49%
Independent study	76	41.08%
School district/state educational training	51	27.57%
Undergraduate level courses	43	23.24%
Other	13	7.03%

Research Question #7: What percentage of SLPs believe that reading and writing fall within their scope of practice?

In order to evaluate clinicians' professional views concerning scope of practice, participants were asked to indicate "true" or "false" when presented with assertions found within the 2001 ASHA position statement regarding the relationship between oral language, reading, and writing (see Table 12). All but one of the assertions received less than 95% of respondents answering "true", indicating that this particular sample of SLPs has a strong understanding of the highly integrated relationship across these three communicative domains. Only 75.73% of respondents believe that children who present with difficulties reading and writing are also likely to have oral language impairments, although 95.67% of respondents believe the opposite to be true, that children with oral language impairments often have comorbid reading and writing impairments.

Table 12. Participants' Views Concerning Reading, Writing, and Oral Language Impairments (N = 206)

	Value	Frequency	%
Direct support of oral language skills can also foster the development of writing skills.	True	200	97.56%
	False	5	2.44%
Oral language provides foundational support for reading and writing skills.	True	198	97.06%
	False	6	2.04%
Oral and written language have reciprocal effects upon on another.	True	197	96.57%
	False	7	3.43%
Children with oral language impairments often struggle with reading and writing.	True	196	95.61%
	False	9	4.39%
The effects of oral and written language growth last from infancy throughout a child's formal schooling.	True	192	95.05%
	False	10	4.95%
Direct support of writing skills can also foster the development of oral language.	True	185	91.13%
	False	18	8.87%
Children who struggle with reading and writing often have oral language impairments	True	156	75.73%
	False	50	24.27%

More specific scope of practice areas (as outlined by the 2001 ASHA position statement) and corresponding views of participants regarding the validity of such areas within speech-language pathology are illustrated in Table 13. In contrast to the previous evaluation of oral language, reading, and writing, there is considerably more variability among the responses. Support of early language development as a facilitator for written language growth, interprofessional consultation with general education teachers regarding SSDs and comorbid reading and writing deficits, and advocating with parents

concerning early reading practices all received upwards of 95% support from the survey participants. Support for reading and writing planning and intervention each received approximately 79% support, while the area which received the least amount of support (45.63%) addressed SLPs' responsibilities for screening of reading and writing deficits, which would include the assessment of phonological awareness skills.

Table 13. Participants' Views Regarding Specific Areas within the Scope of Practice for Speech-Language Pathologists (*N* = 206), multiple responses accepted

Scope of Practice Areas	Frequency	% of support
Supporting early language development as a means of preventing written language difficulties in school	200	97.09%
Consulting with general education teachers in order to maximize success for children with SSDs and comorbid reading and writing deficits in the classroom	199	96.60%
Advocating with parents and teachers regarding exposure and support for early literacy practices	197	95.63%
Designing treatment plans which address reading and writing in the context of speech-language pathology	163	79.13%
Providing treatment for reading and writing deficits in the context of speech-language pathology	162	78.64%
Applying a diagnosis of language-based reading and writing deficits	114	55.34%
Assessment and data gathering regarding reading and writing performance in school	107	51.94%
Screening for reading and writing deficits	94	45.63%
Total individual responses	206	

Discussion

Research Question #1: What percentage of students with SSDs also have reading problems as reported by SLPs?

Overall, a large majority of clinicians reported that they currently provide services to students with SSDs and concomitant difficulties with reading. However, there is distinct variability demonstrated throughout the results regarding the incidence of SSDs and comorbid reading impairments on current caseloads. A portion of these results (e.g. those clinicians who reported a majority of students with SSDs on their caseload presenting with both impairments) provide some support for the corresponding hypothesis which speculates upon a high reported incidence of SSDs and comorbid reading impairments. Variability throughout this sample of clinicians is reflective of the overall heterogeneity of the larger population of children with SSDs (Bishop & Adams, 1990; Catts, 1993; Leitao, et al., 1997; Nathan, Stackhouse, Goulondris, & Snowling, 2004; Peterson, Pennington, Shriberg, & Boada, 2009; Raitano, Pennington, Tunick, Boada, & Shriberg, 2004). However, regardless of the variability among the responses, the current data reflects similar findings from the research literature which demonstrates a similarly variable comorbidity of SSDs and reading impairment, thus providing support for the use of phonological awareness assessment within this population. Distinct variability of incidence within this sample may be explained in part by the makeup of individual caseloads, wherein each caseload contains a unique sample of students presenting with a variety of impairments. Similarly, specific settings could have an impact upon the incidence of both disorders; for example, a specialized school for communication impairments may be more likely to have a higher incidence of students

with both SSDs and reading impairment. Conversely, a public magnet school for gifted and talented students who are admitted into the school as a result of standardized testing (which likely includes assessment of pre-literacy and/or literacy skills) may contain a smaller sample of children with both impairments. Clinicians' unique experience in observing and/or identifying comorbid reading impairments in their students with SSDs may also be a factor affecting variability within estimated reports of incidence.

Research Question #2: How often do SLPs working with students with SSDs assess for phonological awareness skills in this population?

At some point in their careers, a relatively substantial portion of SLPs have assessed for phonological awareness skills for their students who have both SSDs and reading problems. Initially, this result appears positive, as it corresponds with the link between phonological awareness deficits, reading impairment, and SSDs demonstrated throughout the research literature. However, the frequency of use of these evaluations is of a primary concern and must also be carefully considered. Specific results concerning specific standardized assessment demonstrate considerable variability of administration, with a concentration of use centered upon the CTOPP/CTOPP-2 and the PAT with a significant drop-off of usage frequency for an additional thirteen assessments.

Overall, results regarding frequency of phonological awareness assessment illustrate that while phonological awareness skills are being assessed in children with SSDs, there is marked inconsistency and an overall paucity regarding the use of such assessments in this population. These results support the corresponding hypothesis, which states that the frequency of phonological awareness assessment is low in comparison with the prevalence of SSDs and comorbid reading difficulties in students on current

caseloads. Inconsistencies and deficiencies within these results may prove to be problematic by contributing to the likelihood that many children with SSDs and phonological awareness skills may be overlooked, particularly during the preschool years when phonological awareness skills are the most potent and vital for the acquisition and continued development of reading skills.

In consideration of the disproportionately frequent use of the CTOPP/CTOPP-2 by the study sample participants, it is important to note that neither version of this assessment provides an exclusive and comprehensive assessment of phonological awareness skills. The CTOPP and the CTOPP-2 in their entirety are assessments of phonological processing skills, a set of skills which includes, but is not limited to phonological awareness skills alone, therefore these tests are not intended to provide a comprehensive evaluation of phonological awareness skills. More specifically, only one third of the fourteen subtests in the original version of the CTOPP are dedicated specifically to phonological awareness skills. Similarly, in the CTOPP-2, the distribution of phonological awareness subtests is even less comprehensive than in the original version of the test, with only five out of twelve subtests addressing such skills. Additionally, both the CTOPP and the CTOPP-2 involve a substantial number of rapid naming subtests with approximately one-third of all subtests within both versions of the assessment dedicated to rapid naming tasks. When selecting the CTOPP for evaluation of reading related impairments, it is important for clinicians to understand that rapid naming skills and phonological awareness skills, while they both contribute to reading development in unique ways, are independent of each other. In other words, utilizing

rapid naming tasks during treatment sessions will not contribute to improved phonological awareness skills and vice versa (Vander Stappen & Reybroeck, 2018).

Research Question #3: Does a greater incidence of reading problems associate with use of phonological awareness assessment?

Considerable variability among responses regarding incidence of SSDs and comorbid reading impairment with comparable rates of phonological awareness assessment proved inconsequential at demonstrating a relationship between the two factors. Participant responses indicated that clinicians with higher percentages (e.g. 50% and above) of children with SSDs and reading difficulties are not necessarily influenced by a higher incidence of SSDs with reading problems and that clinicians are, overall, no more or less likely to assess for phonological awareness deficits as a result. These results do not support the hypothesis that SLPs who have a higher caseload of children with SSDs and reading difficulties are more likely to assess for phonological awareness skills in this particular population.

Research Question #4: How do suspected reading problems influence an SLP's course of action for assessments?

Of the open-ended responses, phonological awareness and language were by far the two most cited areas for additional assessment for children with SSDs. Overall, this is a positive result regarding phonological awareness assessment, particularly considering the documented link between SSDs, impaired phonological awareness skills, and subsequent reading impairments shown throughout the research literature (Bird, Bishop & Freeman, 1995; Bishop & Adams, 1990; Catts, 1993; Larrivee & Catts, 1999; Leitao,

Hogben, & Fletcher, 1997; Preston & Edwards, 2010; Rvachew, 2007; Rvachew & Grawburg, 2006). As previously noted, five participants refer children with reading difficulties to their school's reading/dyslexia specialist, educational diagnostician, or school psychologist for additional testing of reading and related skills. It is speculated that these five participants may be responding appropriately to the incidence of reading problems according to specific guidelines for their individual school district(s), and that they are not held responsible for assessments of such skills. A number of school districts restrict SLPs to assessment of speech and language measures alone, thus requiring associated areas (e.g. reading, writing), to be referred to other professionals within the educational setting. These stipulations may impact a substantial portion of SLPs and their abilities to assess and/or treat these areas when they are presented with such concomitant impairments on their caseloads. Results regarding additional assessment areas and referrals to other professionals provide support for the corresponding hypothesis.

Research Question #5: How does the year a Master's Degree in Communication Sciences and Disorders was obtained associate with reported knowledge of the ASHA (2001) position statement and assessment of phonological awareness skills in children with SSDs?

Overall, clinicians who have read the position statement are more likely to have assessed for phonological awareness skills in their students with SSDs, regardless of the year in which they received their degree. However, clinicians receiving their degrees after the 2001 publication were less likely to have read the statement. These clinicians were also less likely as a group to have assessed for phonological awareness skills than those individuals who have read the statement and received their degrees prior to the 2001

publication. This result does not support the corresponding hypothesis with reference to the year of degree attainment.

The exact nature of the association between respondents reading the hypothesis and the corresponding year of degree attainment may or may not be coincidental as knowledge of the statement is likely not the only deciding factor regarding the use of phonological awareness assessment for this population. Additionally, clinicians receiving their degrees after the 2001 publication were less likely to have read the position statement. One possible explanation for this result could be that clinicians receiving their degrees after the 2001 publication may have received more direct education regarding SLP roles in reading and associated phonological skills. It is possible that graduate programs and continuing education units (CEUs) were restructured, amended, or created in response to the statement. As a result, these clinicians may be less likely to read a statement which would simply reinforce instruction and information which they have already received through other formats. Conversely, clinicians receiving their degrees prior to publication of the statement may not have received explicit instruction in their graduate programs or CEUs regarding SLPs' roles and responsibilities for reading and related skills (e.g. phonological awareness). Therefore, when presented with children with SSDs and comorbid reading impairments on their caseloads, these clinicians may have been more likely to seek guidance or instruction from ASHA regarding their specific clinical responsibilities and were therefore more likely to read and rely upon information provided by such a statement.

The date of publication in relation to year of degree obtainment may also be a factor in these results. Clinicians receiving degrees from, for example, 2010 or later ($n =$

80), may likely view a 2001 ASHA paper as being “out-of-date”, and may be somewhat less likely to read an older, albeit still very relevant, position statement. Current graduate program instruction continually asserts the importance of reading current research, and it is very likely that a 2001 paper does not meet this criterion, therefore many clinicians may disregard such a statement as a result.

Additionally, when interpreting these results, it should be noted that any number of additional factors beyond knowledge of the ASHA 2001 position paper may influence clinical decision-making regarding such assessments (e.g. client-specific characteristics, school district protocols, working knowledge of current relevant research, quality and content of graduate and/or continuing education regarding phonological awareness assessment, etc.).

Research Question #6: In which settings have SLPs received training in conducting assessments of phonological awareness skills?

The majority of respondents indicated that they have received additional education or training in phonological awareness assessments and that such training has been provided in a variety of settings. These results support the corresponding hypothesis. Overall, these results are somewhat positive in that education and training in phonological awareness are being provided in different settings. However, it should be noted that CEUs are not subject to the same regulation and oversight from the American Speech-Language-Hearing Association (ASHA) which is applied to graduate-school curricula. Therefore, the quality of CEU instruction should be assumed to be more variable with regard to quality and content. On an additional positive note, a smaller, albeit still substantial portion of respondents indicated that they have engaged in

independent study in order to improve their clinical knowledge with regards to phonological awareness assessment.

Research Question #7: What percentage of SLPs believe that reading and writing fall within their scope of practice?

Throughout the initial research phase of this study, reasons why SLPs do not routinely assess for phonological awareness were taken into consideration. Because the research literature has established an association between SSDs and reading impairments, a paucity of evidence was not cited as a cause for a proposed lack of phonological awareness testing by SLPs. Subsequently, two main reasons were settled upon: first, time demands upon SLPs, particularly in the public school setting are at an exceptionally high level. It is understood that many SLPs feel that they don't have the time to perform any additional assessments, therefore phonological awareness skills are often not considered along with more typically administered speech and language assessments. However, the second, and primary reason taken into consideration was that many SLPs may not consider assessment and intervention of reading impairments to be within their scope of practice. This reasoning is connected closely with the 2001 ASHA position statement, which was intended to educate SLPs concerning the roles and responsibilities regarding reading and writing as part of speech and language assessments and intervention in educational settings, in particular.

Responses to true/false questions regarding the roles of reading and writing within the scope of practice of speech-language pathology received largely favorable responses, with the significant majority of respondents agreeing that both domains are included within an SLP's clinical responsibilities as they relate to the development of

communication skills, both oral and written. The only specific area in which there was considerably less agreement among the respondents concerned two forms of a statement addressing reading and writing difficulties and co-morbid oral language impairments. A significant majority of respondents agreed that children with oral language impairments often have difficulties with reading and writing. However, there was considerably less consensus that children who have difficulties reading and writing are also likely to have oral language impairments, although the meaning of the statement in this alternate form essentially remains the same. These results may in part be due to the increased knowledge that SLPs have regarding oral language impairments and the effects on associated areas. Understanding of the effects of reading and writing deficits upon language is likely less extensive for SLPs because it is not a primary focus within their scope of practice. However, it is vital for clinicians to understand the reciprocal relationship which oral language impairments and reading and writing have with each other, therefore it is somewhat problematic that the connections between each of these three areas is not more readily agreed upon by respondents in the study sample.

Overall results concerning more specific scope of practice areas related to reading and writing within the context of speech-language pathology are positive, with a significant majority of participants agreeing on several important areas. Support for early language development as it fosters written language growth, interprofessional consultation with general education teachers regarding SSDs and comorbid reading and writing deficits, and advocating with parents concerning early reading practices were all supported by a significant majority of respondents. Results in these areas regarding indirect support of reading and writing skills do not support the corresponding hypothesis

that many clinicians do not believe that reading and writing fall within an SLP's scope of practice. Such results are also quite promising, especially in light of the importance of early identification and remediation of phonological awareness deficits in order to support literacy acquisition and development. However, it should be noted that percentages of support begin to decline as skills become more specific regarding more direct roles of SLPs in reading and writing assessment and intervention. For example, support for reading and writing planning and intervention in the context of speech-language pathology garnered somewhat less support than previously mentioned areas. And perhaps the most troubling figure comes where less than half of respondents agreed upon SLPs' responsibilities for screening of reading and writing deficits, which includes assessment of phonological awareness skills. This lack of support for screening of such comorbid deficits by SLPs traces back to the initial speculation regarding proposed low rates of phonological awareness assessment by SLPs. According to this result, approximately half of the respondents simply do not consider reading and/or writing related screenings to be part of their scope of practice, therefore, it may be assumed that they are unlikely to perform such screenings for their children with SSDs on a regular basis, if at all. Results in these areas which are more specific to the direct assessment and remediation of reading and writing skills within the context of speech-language pathology support the aforementioned hypothesis regarding scope of practice. Additionally, these results are in opposition to ASHA scope of practice guidelines as well as results from the corresponding research literature linking SSDs and reading deficits resulting from impaired phonological awareness skills. Furthermore, two important issues become apparent from these results: first, some clinicians may not be fully observing

ASHA guidelines for reading assessment and intervention, and second, a portion of clinicians are likely not utilizing past and current research literature in support of their clinical practice for children with SSDs in the educational setting.

Clinical Implications

This current study intends to provide data illustrating current practices of SLPs regarding the assessment of phonological awareness skills for students with SSDs with or without additional comorbid communicative impairments. Such data was obtained in order to provide support for the requisite assessment of such skills within the overall population of children with SSDs. Due to evidence throughout the research literature concerning the link between SSDs, phonological awareness impairments, and subsequent reading difficulties along with the distinct importance placed upon literacy skills within educational settings, it is apparent that phonological awareness screenings should be included within any speech and language assessment for this particular population. However, results of this current study demonstrate that while a substantial portion of clinicians have assessed phonological awareness skills in their clients with SSDs either through informal screenings or by using standardized assessments at some point during their careers, the frequency at which these instruments are being used is extremely low. Furthermore, no association was found between a higher prevalence of SSDs and comorbid reading impairments on caseloads and use of phonological awareness assessment, which is an additional area of concern.

Phonological awareness screenings are quick, efficient and can be used to determine the need for more standardized and comprehensive assessment, either by the SLP, or by other educational professionals (e.g. reading specialist, educational

diagnostician, school psychologist) as dictated by individual school district protocols. Furthermore, because phonological awareness skills can be assessed in children as young as 3 ½ years of age, such screenings should not be limited to children at ages where they are “expected to be reading” (e.g. kindergarten) (Puolankanaho et al., 2007). SLPs working with preschool-aged students are also responsible for using phonological awareness screeners, possibly even more so than their colleagues who provide services for older school-aged children. Specifically, early, pre-literate phonological awareness skills which develop during the preschool years are vital for the acquisition and ongoing development of literacy skills. Consequently, early identification of phonological awareness impairments during preschool provides the foundation for early intervention of such difficulties. Furthermore, children who receive remediation of phonological awareness skills from as young as age three (in addition to direct intervention for speech sound productions) are more likely to acquire reading skills at comparable levels to their typically developing peers when compared with children who receive articulatory or phonological intervention for speech sounds alone (Gillon, 2000). Additionally, students with SSDs who receive early phonological awareness intervention are more likely to read at comparable levels to their typically developing peers once they reach elementary school (Gillon, 2002). And students who receive phonological awareness training to support literacy skills in conjunction with direct remediation of speech sound productions have been found to receive added reciprocal benefits from the integration of the two interventions across both domains (Gillon, 2005). In short, the sooner phonological awareness impairments are identified, the more impact early remediation will have on both short and long-term literacy outcomes for these children. Phonological awareness

skills lose their potency as children reach mid-to-late elementary school, and if such skills have not been effectively remediated early on, these children will continue to struggle with reading throughout their educational careers and beyond.

This recommendation is asserted in consideration of the extraordinary time demands upon SLPs, particularly those clinicians who are providing services in the public schools. There are several public domain informal screening instruments currently available which are accessible and easy to administer and which can be adapted according to the age and skill-set of individual students (see Appendix C). Additional resources concerning phonological awareness assessment are provided in additional appendices. Appendix A provides a chart of phonological awareness skills and corresponding examples in chronological order of development in order to foster clinician awareness and understanding of skill acquisition and to assist clinicians with the adaptation of screening instruments in the interest of time, efficiency, and efficacy. Additionally, a decision-tree regarding the course of action for phonological awareness assessment for children with SSDs is provided in Appendix B.

Research describing current practices concerning the use of phonological awareness assessments is only one part of the issue of SSDs and comorbid reading impairments. Additional research regarding the feasibility of phonological awareness screening in conjunction with compulsory speech and language measures is necessary in order to illustrate and establish the practicality of utilizing such measures in demanding clinical and school settings. A thorough examination addressing the quality and content of phonological awareness education in graduate programs and CEUs is also in order. Such an examination may provide insight into the observed low frequency of

phonological awareness assessment use for children who present with SSDs and comorbid reading difficulties. A comprehensive assessment may also identify areas for improvement upon current phonological awareness education for the benefit of both current and future practicing clinicians and their clients.

Study Limitations

Questions regarding both requisite and additional assessments administered to children with SSDs and reading problems should be carefully considered within the context of the service delivery team (e.g. general education teachers, SLPs, reading specialists, etc.) in educational settings. In some school districts, clinicians only provide intervention services and therefore do not conduct their own assessments, thus relying largely upon independent diagnosticians for these services. It is possible that a portion of the negative responses in relation to requisite and additional assessments for children with SSDs may have been provided by clinicians who are not responsible for formal assessments in any capacity. Additionally, the use of informal screening instruments for phonological awareness skills was not explicitly addressed when examining the frequency of administration for assessments overall. The focus of this current study centered instead upon the use of standardized assessments of phonological awareness skills. However, the open-ended survey question which addressed additional assessments (either formal or informal) administered for children with SSDs and reading impairments provided some information regarding additional screenings/testing for phonological awareness skills in 37.39% of respondents. Several respondents cited specific standardized tests and two respondents specifically mentioned informal screenings, however, the majority of responses merely cited phonological awareness as an area of

further interest for this subset of the larger population of children with SSDs. Additional research concerning the specific use of informal screeners/observations is necessary for a more comprehensive examination of current phonological awareness assessment practices.

This current study evaluated assessment practices of clinicians providing services for children with SSDs, regardless of whether the setting was public or private, school or clinic. Future research concerning phonological awareness assessment would isolate the experience of public-school SLPs due to the distinct relevance that such skills hold within the public school setting. Additional exploration of specific factors influencing a clinician's decision to assess for phonological awareness (e.g. client-specific characteristics, working knowledge of current relevant research, quality and content of graduate and/or continuing education regarding phonological awareness assessment, etc.) would also be necessary in order to provide a more comprehensive understanding of influencing factors in clinical decision-making in this particular area of practice. Furthermore, practical factors, such as workload time constraints in public school settings and specific school district policies regarding the administration of supplemental assessments by SLPs in addition to requisite measures of speech and language, should also be taken into consideration.

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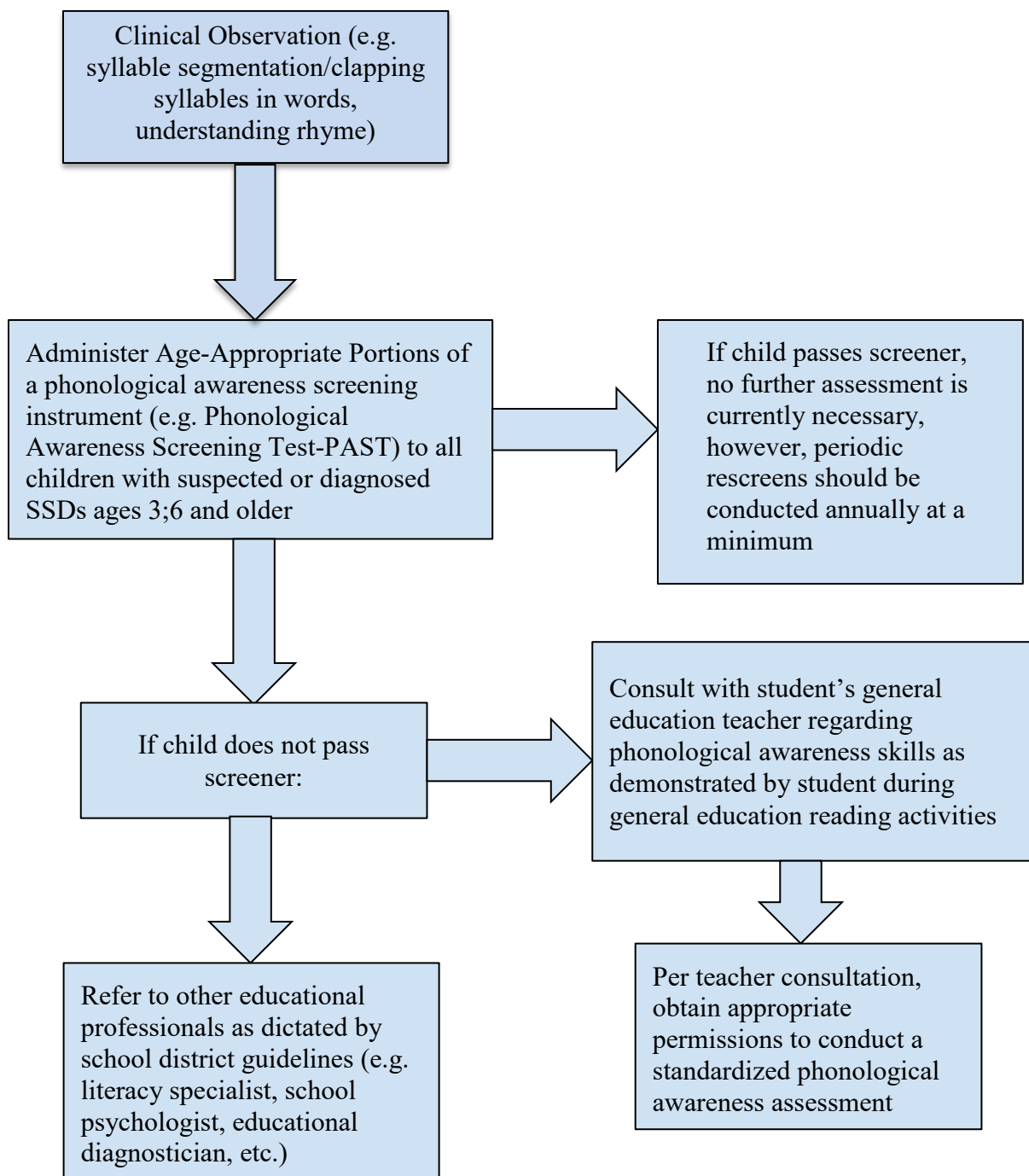
Appendix A: Phonological Awareness Skill Development Chart

Adapted from Paulson, L. H. & Moats, L. H. (2010). *LETRS for early childhood educators*. Longmont, CO: Cambrium Learning Sopris West.

Acquisition of Phonological Awareness Skills

Typical Age of Acquisition	Skill
Rhyming	Examples: cat, bat, mat, sat
2-3 years	Participates in nursery rhymes, finger plays, songs, and book reading
3-5 years	Matches rhyming words orally
4-5 years	Produces rhyming words
Alliteration	Examples: ball, bounce, bath, bug
3-5 years	Recognizes words which share initial sounds
5-7 years	Produces words which share initial sounds
Blending	
3-5 years	Combines isolated syllables (onsets and rhymes) to form words (e.g. b-at, m-an, d-og)
5-7 years	Combines isolated sounds to form words (d-o-g; t-r-e-e)
Segmentation	
3-4 years	Counts the number of syllables within words
4-5 years	Identifies initial sounds in words
5-6 years	Isolates and pronounces initial, medial, and final sounds in CVC words

Appendix B: Decision Tree for Phonological Awareness Assessment



Appendix C: Additional Resources for Screening of Phonological Awareness Skills

Public Domain Screening Instruments

Phonological Awareness Screener Test (PAST)

<http://www.maspweb.com/resources/Documents/PAST%202016.pdf>

Quick Phonological Awareness Screening (QPAS)

https://www.uen.org/syc/downloads/Handout6_QPAS.pdf

Phonological Awareness Skills Screener (PASS)

http://cloud.rpsar.net/edocs/Dyslexia/PASS_recording.pdf

