Preschool-Age Speech and Language Screening Procedures:
A Survey of Current Practices Used by Speech-Language Pathologists

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Abstract

What are the current practices and procedures for preschool-age speech-language screenings? Are there generally accepted guidelines for preschool-age speech-language screenings? What factors influence the speech-language screening process? These are some of the questions this study aims to answer by exploring the current speech-language screening procedures for preschool-age children. In order to provide an updated description of current preschool-age speech-language screening procedures, data was collected through a comprehensive survey distributed to certified speech-language pathologists (n = 80) who administer preschool-age speech-language screenings. The questions presented in the survey focused on characteristics of people who administer speech-language screenings, logistics of screenings, who is screened and how are they selected, and factors that influence the screening process. This study presents the survey results in a descriptive manner, exploring interesting relationships, and discussing the implications of the results.

Introduction

Background

Nearly 1 in 12 (7.4%) school-age children experience language disorders (Tomblin et al., 1997). Language disorders can affect many aspects of a child's life, including academic areas, such as reading, writing, and oral communication, social interaction, and later vocational development (CDC, 2018). With this prevalence of speech and language difficulties and the far-reaching impact in academic, social, and vocational outcomes, it is very important to identify these issues as early as possible. Early identification allows for early intervention, which typically leads to the best outcome for the speech and language development of these children (Law, Boyle, Harris, Harkness, & Nye, 2000). The overall accuracy of identifying ~~these~~ children with speech and language delays or disorders decreases after 5 years of age, making the first 5 years of life a critical time for accurate identification of children with delays or disorders (Law, et al., 2000). While early identification and intervention are key to facilitating the best possible language outcomes for children with delays and disorders, there is no easy way to go about screening for speech and language disorders.

It is within a speech-language pathologist's scope of practice to conduct speech-language screenings for children who are in the process of developing speech and language skills. According to the American Speech-Language Hearing Association (2007), "screening for communication needs in infants and toddlers is a process of identifying young children at risk so that evaluation can be used to establish eligibility [for intervention services], and more in-depth assessment can be provided to guide the development of an intervention program. The aim of screening is to make a determination as to whether a particular child is likely to show deficits in communication development".

The designated purpose of screening services are "to identify individuals with potential communication or swallowing disorders." They are not diagnostic, exhaustive, or conclusive (ASHA, 2004). At the conclusion of speech-language screening procedures, children are either scored as having 'passed' the screening, indicating that no further action is required because there are no signs of a communication disorder, or as having 'failed' the screening because signs are present.

Screening is a complex process in which there are many factors that influence the screening outcome. These factors include: action post failed screening, choosing tools based on psychometric properties of the specific screener, addressing linguistic barriers, and making choices appropriate for diverse populations that are screened. There is no single screening tool that works for all populations of children because of normal variation that occurs due to linguistic differences and cultural differences that could impact an individual's performance on a screener. Additionally, loss to follow up, sub-optimal screening accuracy, linguistic barriers to screening, and a lack of established guidelines regarding who, when, how and whether to screen are all factors that make speech-language screening challenging.

Loss to Follow-Up

When a child is scored as "failing" the speech-language screening, there are various next steps possible. Some of these actions post failed screening include: the child receiving a full evaluation, the child being placed in a monitor category, another follow-up procedure is used, or no action is taken. As noted by Klee, Pearce, and Carson (2000), the most advantageous action following a failed screening is for the speech-language pathologist – or whomever is administering the screening – to refer for or conduct a full evaluation of the child. However, this

does not always happen. Without a full evaluation, a child may be lost to follow-up, meaning that a child who actually does have a speech or language delay or disorder would not receive the necessary identification and/or intervention, since no action post fail was taken (Klee, et al., 2000). This full evaluation is intended to "be comprehensive and assess all areas of suspected disability" and serves to identify or diagnose a delay or disorder, if present, making it a key next step in identifying children with speech or language delays or disorders (ASHA, 2004).

Screening Accuracy

Available screening tools have a range of psychometric properties that impact their ability to be used to accurately identify children who show signs of speech or language delays or disorders. These psychometric properties, including specific screeners' reliability and validity, are often unknown and there is a lack of data and standardized indices to examine specific criteria of these screening procedures (Sturner, Layton, Evans, Heller, Funk, Machon, 1994). Because there are many different screening procedures and no generally accepted guidelines, it is difficult to examine the psychometrics for every screening procedure available, in order for clinicians to successfully evaluate the screening tool they are using (Sturner, et al., 1994). The important psychometric information that would allow a clinician to determine the validity of an available tool for screening purposes is often unavailable in the test manual or elsewhere (Gray, Plante, Vance, & Henrichsen, 1999).

The imperfect ability of any speech-language screening tool to discriminate typical from atypical speech and language development means that all screening tools and procedures will result in false positives and false negatives. False positives are when a child is identified as demonstrating signs of language delay or disorder and in need of further evaluation, when the

child actually has no disorder. Likewise, false negatives can also occur, when a child is identified as not demonstrating signs of language delay or disorder and not in need of further evaluation, when the child actually has a disorder. These incorrect screening outcomes could also occur more frequently due to other factors associated with screening, such as: lack of training or skill of the individual who administers the screening procedure (because it is not always a speech-language pathologist who conducts the speech-language screenings) and the use of a screening tool with a child who is a member of a population not represented in the normative sample.

Linguistic Barriers to Screening

The United States is heterogenous, culturally and linguistically: over 20% of the population speaks a language other than English at home, with over 350 different languages represented (US Census 2009-2013). Due to the extremely variable and diverse representation of languages found in the United States, it is not feasible to have an accurate screening procedure that could be used for all children. This is one factor that contributes to the lack of *universal* methods or guidelines for screening (Sturner, Layton, Evans, Heller, Funk, & Machon, 1994).

To illustrate the variety of screening procedures available, several key features are described here. Screening procedures are typically considered either *standardized – formal* tools or *non-standardized – informal* screening procedures. "Standardized assessments are empirically developed evaluation tools with established statistical reliability and validity. A standardized test is one that requires all test takers to answer the same items/questions in the same way and that is scored in a standard or consistent way, thus making it possible to compare the relative performance of individuals or groups of individuals. There are two types of standardized assessment instruments: norm-referenced and criterion-referenced" (ASHA, n.d.). *Standardized*

– *formal* screening procedures typically take a short amount of time to administer and can have good reliability for accurate identification. However, a major issue is that even when tools exist for languages other than English, the person administering the tool must be fluent in the language(s) of assessment *and* must have specialized knowledge of speech-language development, like a speech-language pathologist. So, even when (*if)* screening tools exist in a child's native language(s), speech-language pathologists are still limited by their own language proficiencies, as well as the accessibility to these screening tools. There are several *standardized – formal* tools that are adapted for Spanish and Spanish-English bilingual children, but other languages are not well represented. Therefore, only certain non-English speaking populations are able to be served by these *standardized – formal* measures, since a tool for monolinguals in one language is not necessarily appropriate for a bilingual (Nelson, Nygren, Walker, & Panoscha, 2006).

For children who do not fit the mainstream mold that the *standardized – formal* screening procedures were created for, there are *non-standardized – informal* procedures. *Non-standardized – informal*, procedures include observation techniques, such as analog tasks ("observation of the individual in simulated or staged communication contexts that mimic real-world events, including peer group activities"), naturalistic observation, systematic observation, and contextual analysis ("observation across a variety of contexts [settings and tasks] to obtain descriptions of language functioning and identify specific problem areas and contextual variables that play a part in the individual's communication abilities"), language sampling, dynamic assessment, and curriculum-based assessment (ASHA, n.d.). All of these informal procedures are designed to provide a more holistic view of the child and employ the speech-language

pathologist's professional judgement to evaluate the child, rather than using *standardized – formal* measures (ASHA, n.d.).

Populations Screened

In order to select which children are to be screened, there are two different approaches – *universal* screening and/or screenings based on *referral or concern* by parent, teacher, or physician. Wallace, Berkman, Watson, Coyne-Beasley, Wood, Cullen, and Lohr (2015) indicate that "identifying speech and language problems before children enter school can foster initiation of early interventions before these problems interfere with formal education and behavioral adjustment. American Academy of Pediatrics (AAP) clinical guidelines recommend that pediatric health care providers perform surveillance at every well-child visit for children <36 months of age; should concerns arise, screening should be administered using *standardized – formal* developmental tools. Irrespective of concerns, the guidelines identify 9, 18, and 24 or 30 months as appropriate ages for developmental screening." These guidelines express the process and importance of developmental surveillance performed by pediatricians, as a key figure in early identification of children with speech-language delays or disorders. Children who are screened based on *referral or concern* typically display some behavior(s) or lack of typical skills for a given age that poses some concern to an adult and are therefore referred to a speech-language pathologist for further evaluation.

On the other hand, there are local guidelines in *some* places that mandate '*universal*' speech-language screenings for all children of a certain age or in a specific class or year in school; however, this practice is not as commonly seen (Law, et al., 2000). As an example of a similar practice, *universal* screenings are used for Newborn Infant Hearing Screenings. This

practice has become a standard of care in hospitals [and birth centers] nationwide, and has been in effect since 1999, screening over 96% of all newborns (ASHA, n.d.). These Early Hearing Detection and Intervention (EHDI) guidelines include hearing screening completion by 1 month of age, diagnosis of any hearing loss by 3 months of age, hearing aid selection and fitting within 1 month of confirmation of hearing loss if parents choose that option, and entry into early intervention (EI) services by 6 months of age (ASHA, n.d.). In terms of the guidelines used for speech-language screenings, they vary by state, educational program, and even school districts within states. Each state, school district, or educational program is able to make their own guidelines because truly "*universal*" (i.e., nationwide) guidelines do not exist. In fact, "The United States Preventive Service Task Force (USPSTF) concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for speech and language delay and disorders in children aged 5 years or younger." This means that evidence of the effectiveness of screening for speech and language delays and disorders for improving later speech-language outcomes has not been clearly established. As a first step in sufficiently evaluating the effectiveness of screening is to describe current screening practices (USPSTF, 2015).

Motivation for Current Study

The lack of information regarding current screening processes, and the need for that information, motivates this study. The existing literature on the topic of preschool-aged speech-language screening is outdated; most research is approximately 20 years old (Klee, et al., 2000; Law, et al., 2000; Schraeder, Quinn, Stockman, & Miller, 1999; Sturner, et al., 1994). This lack of current research leaves the field of speech-language pathology, speech-language pathologists,

and researchers without current information to guide practice. Past studies indicated that there is no gold standard screening tool, procedure, or set of procedures, and no established guidelines for preschool-age speech-language screenings (Nelson, et al., 2006).

Due to the highly variable speech-language screening practices, the results are also highly variable and not reliable in accurately screening all children. Nelson, et al., (2006) indicate that there are inadequate studies on specific screening procedures in preschool children. However, over all, the use of speech-language screenings does show improvements in outcome measures for the development of speech and language skills in children, yet there needs to be more research on the subject (Nelson, et al., 2006).

Where these studies (Nelson, et al., 2006; Sturner, et al., 1994; Wallace, et al., 2015) fall short, is the lack of conclusive evidence for *universal* speech-language screening and lack of uniform screening practices across populations (Nelson, et al., 2006; Wallace, et al., 2015). This lack of uniformity shows there is no single speech-language screening practice that can accurately be used for all children, and how different procedures may work on certain children, but not others (Nelson, et al., 2006). Sturner, et al. (1994) noted the extreme difficulty in describing and analyzing screening procedures due to the sheer number of different screening procedures available.

Further, there are questions about how decisions are made regarding which procedure to use (i.e. *standardized – formal* or *non-standardized – informal* and the specific screener), and whether speech-language pathologists decide on the screening procedure(s) they use, or if there is some other entity that makes these decisions – i.e. school district, national guidelines, etc. (Klee, et al., 2000).

Also noted in past studies (Dockrell & Marshall, 2015; Klee, et al., 2000; Siu, 2015), the speech-language screenings that are used have limitations in the populations that they are capable of accurately screening, including, but not limited to: economically disadvantaged populations, culturally diverse populations, bilingual children, users of non-mainstream English dialects, and non-English speaking children. These populations are all considered to be "hard to screen populations" that are not able to be accurately screened with the *standardized – formal* screening tools that are currently available (Law, et al., 2000). With a lack of *standardized – formal* screening tools available, *non-standardized – informal* screening procedures are often used (Wallace, et al., 2015). The use of informal procedures requires independent professional interpretation of the screening results, which relies heavily on the individual evaluator's extensive knowledge of speech-language development in the target population. Speech-language pathologists responsible for screening these children may not have that language-specific expertise. For example, only 6.2% of ASHA-affiliated speech-language pathologists in the United States indicate their status as a bilingual service provider, though some states have significantly fewer (0.6% in South Dakota) or more (14.3% in New Mexico) (ASHA, 2018). Even if service providers are "bilingual", they are typically only proficient in ONE other language, and never in all languages.

This Study

Based on a lack of current data on the subject, and questions unanswered in previous studies, this study aims to provide an updated and comprehensive description of preschool-age speech-language screening procedures and tools currently being used. In addition, this study aims to report on different factors that may influence the administration of speech-language

screening procedures for preschool-age children. Developed with the help of literature review and interviews, a survey was distributed to certified speech-language pathologists in order to gather up-to-date information on current screening practices.

The goals of this study were to describe:

Characteristics of people who administer screenings:

- The years of experience of the speech-language pathologists who administer the screening procedures
- The individuals who administer the screening procedures (when not speech-language pathologists)
- Self-rated confidence level of speech-language pathologists in their use and interpretation of screening procedures

Logistics of screening, such as:

- The settings in which screenings take place
- Different measures of time relating to the screening procedures – i.e. the amount of time each screening takes, and the time the speech-language pathologists spend on screenings compared to other tasks
- The type of screening procedure(s) used
- Areas of development assessed in the screening (e.g. speech & language only or a variety of developmental domains)
- Follow up protocol, post failed screening

Who is screened and how they are selected:

- Populations included in the screening procedures
- The ages of the children screened
- Whether screening of preschool age children is completed based on *referral* of children suspected of speech or language delay or through '*universal*' practices for all children of a certain age or in a specific class or year in school are screened
- Who refers the children when they are referred based on *concern* and if there is any communication with this individual after the referral is made

Factors that influence the screening process:

- Concerns that speech-language pathologists have regarding the population screened or the specific screening tool or procedure
- Speech-language pathologist's awareness of national guidelines for whether *universal* speech and language screening should be mandated for children under 5 years old

In addition to the features of preschool-age speech-language screening procedures that this study aimed to describe, the following predictions were made based on the literature review and structured interviews.

Given previously reported data on factors that influence the outcomes of speech-language screenings (Dockrell & Marshall, 2015; Nelson, et al., 2006; Siu, 2015), we were interested in describing the relationship between the number of years of experience that a speech-language pathologist has, and his or her confidence in making referrals for or providing full evaluation for children who do not pass screenings. The predicted relationship was – if a speech-language

pathologist has more years of experience, then he/she would be more confident in his/her ability to discern who is in need of a full evaluation.

Additionally, given previously reported data on challenges associated with screening children from linguistically diverse backgrounds (Schraeder, et al., 1999), and comments gathered during the structured interview, we were interested in describing the relationship between working with "hard to screen" linguistically diverse populations — specifically bilingual children and/or children who use non-mainstream English dialects — and using *non-standardized – informal* procedures when screening a child.

Furthermore, given that *standardized – formal* screeners are useful for some populations and not others (including different ages, languages, backgrounds, etc.), and no one tool meets screening needs (Klee, et al., 2000; Law, et al., 2000; Stott, Merricks, Bolton, & Goodyer, 2002; Wallace, et al., 2015), which was also reflected in speech-language pathologist responses during the structured interviews, it was predicted that using a combination of both *standardized – formal* and *non-standardized – informal* procedures would be the most common practice reported for preschool-age speech-language screenings.

Given previously reported data on challenges to the feasibility of *universal* screening procedures and variety of ways children are selected to receive screenings (Law, et al., 2000; Stott, et al., 2002), as well as current USPSTF (2006) recommendations, we were interested in exploring the proportion of *universal* screenings compared to screenings conducted based on *referral or concern*. It was predicted that there would be more screenings conducted based on *referral or concern* than *universal* screening procedures, due to limited screening resources and lack of evidence that supports the effectiveness of the practice of *universal* screening, and no national guidelines for screening.

Method

Survey Development Procedures

In order to get at the questions of interest, a survey was developed to be distributed to speech-language pathologists. First, to get an idea of past research on the topic of preschool-age speech-language screening procedures, a literature review was conducted. From the background information that was gained from the literature review, screening practices that required further exploration, or updated descriptions, were identified. In order to further explore screening procedures and identify content areas for survey development, structured interviews with open-ended questions were conducted with two licensed speech-language pathologists who conduct speech-language screenings for preschool-age children. One interview was conducted over the phone, while the other was conducted via email.

Some of these open-ended interview questions included:

- What features do(es) the screening procedure(s) you use include? (e.g., standardized norms, developmental domains screened, specific tools used, etc.)
- What problems are there with the screening procedure(s) you use?
- Do you think the screening procedure(s) you use is effective in doing what it/they is/are supposed to? Why or why not? What do you think could be improved?
- Are there children for whom the screening does not work or is not appropriate? If so, what do you do in those situations?
- What is done at the end of the screening procedure / what is the next step?
- How is a child selected to be screened? (e.g., *universal* or *referral or concern*)

The interview responses helped to identify themes, key words, and specific terminology used surrounding the practices and procedures of preschool-age speech-language screening procedures, as well as current issues that practicing speech-language pathologists are noticing today. Themes and key words identified included length of screening procedures, the specificity, sensitivity, and predictive validity of a given tool, dynamic assessment, national or federal regulation of screening procedures, and *standardized – formal* tools compared to 'adapted' screening procedures. Additionally, some of the concerns noted were: a lack of formal screening procedures appropriate for children who are bilingual or multilingual (i.e. the tools available are not representative of the child's non-English/Spanish language(s)), excessive false positives, a lack of follow up data post screening, and lack of reliability with the individual who administers the screening procedure.

Survey questions were development based on the themes identified in the interviews. Additionally, specific terminology used by the interviewed speech-language pathologists representing the survey content was identified. For each survey question developed, the question modalities and response style were carefully selected to best capture the range of possible answers and obtain data that could be assessed in an effective and insightful way – ensuring adequate face validity. Face validity "is the extent to which a measurement method appears 'on its face' [externally] to measure the construct of interest" (AERA, APA, & NCME, 1999). Question modalities were analyzed for their accessibility and comprehensibility of the given response options – with all possible choices represented, and 'other' categories identified when needed.

These question-answer modalities include fill in the blank, mono-select (i.e. select the best response), and a multi-select option, for when multiple responses were possible. Examples are as follows:

Fill in the blank:

On average, how much time (in minutes) does each screening take?

_____

Mono-selection / select the best answer:

What types of screening procedures do you use?

- ○ Standardized / formal
- ○ Non-standardized / informal
- ○ Both

Multi-select option:

What setting do you administer the speech and language screening in? (Select all that apply)

- ☐ School
- ☐ Private practice
- ☐ In home
- ☐ Clinic
- ☐ Hospital
- ☐ Other _____

Once the survey was developed, the final survey form was tested by three individuals, all with varying degrees of knowledge on the topic. The survey was tested for consistency in wording and the themes identified, as well as the representative nature of answer options, comprehensibly, and readability. The survey testing also served to establish an estimation of time the survey took to complete, in order to report this to the potential survey participants and provide appropriate compensation for their time.

To ensure content validity, which is "the extent to which a measure covers the construct of interest" (AERA, APA, & NCME, 1999), two researcher-practitioners with relevant and complementary experience reviewed the survey. An assistant professor at the University of Colorado – Boulder in Speech, Language, and Hearing Sciences, who is also a certified speech-language pathologist with specific knowledge of background literature and practice in this area provided input throughout the survey development process, enhancing construct validity and providing an evaluation of content validity of the final survey. An associate professor in Research and Evaluation Methodology in the Education Department at the University of Colorado – Boulder reviewed the survey and offered guidance at the level of the survey content, wording, and the overall flow of the survey. From this guidance, several of the survey questions were split into multiple parts, or additional questions were added, in order to provide necessary clarification.

One such change was made to the survey question regarding the specific screening tools and procedures used by the speech-language pathologists, which was separated into two questions, independently addressing *standardized – formal* tools, and *non-standardized – informal* procedures were used. The original question "*Please list specific tools (e.g. screeners, protocols) or procedures (e.g. observation, language sample) that you use on a regular basis*"

was separated into the questions "*Please list specific standardized / formal tools that you use on a regular basis*" and "*Please list specific non-standardized / informal screening procedures that you use on a regular basis*." Additionally, for questions that include proportions (i.e. proportion of screening procedures used *standard – formal* vs *non-standard – informal* and proportion of '*universal*' vs 'based on *referral or concern*') there were additional questions created specifically to indicate the proportions separately from the general questions. For the question regarding the hard to screen populations, some of the response choices were reworded to be more explicit (i.e. non-mainstream English dialects with the example of African American English – AAE), as well as rewording the choices to include more culturally sensitive language.

Prior to distributing the survey to the participants, approval from the Institutional Review Board (IRB) at the University of Colorado – Boulder was obtained. Within this application, a copy of the survey and survey questions were provided, in order to be reviewed for ethical practice. An explanation of the necessary security and confidentiality procedures were outlined, showing how the data would be secured and how the participant's privacy would be protected. Participants were compensated for their time in for completing the survey but were informed of no direct benefits arising from the completion of the survey.

Recruitment

The finalized survey (see Appendix A for a copy of the survey) was posted on two American Speech-Language Hearing Association (ASHA) Community discussion sites (https://community.asha.org/communities/), on the Early Intervention page (~2,900 members) and the SLP Schools page (~3,600 members). These specific pages were selected because of the member demographic: large groups of certified speech-language pathologists who conduct

speech-language screenings for preschool-age children that we were attempting to recruit. Once the sites were selected, a post was created, explaining the survey purpose, allowing individuals to read a brief synopsis about the survey to see if they were eligible and interested in taking the survey.

Participants

The qualifications necessary to take the survey were that the individual be a certified, licensed speech-language pathologist who administers preschool-age speech-language screenings. All participants indicated that they met these criteria. Eighty surveys were fully completed by the end of the data collection period. Of these 80 survey participants, 58 people reported their location of practice – including individuals from 32 different US states.

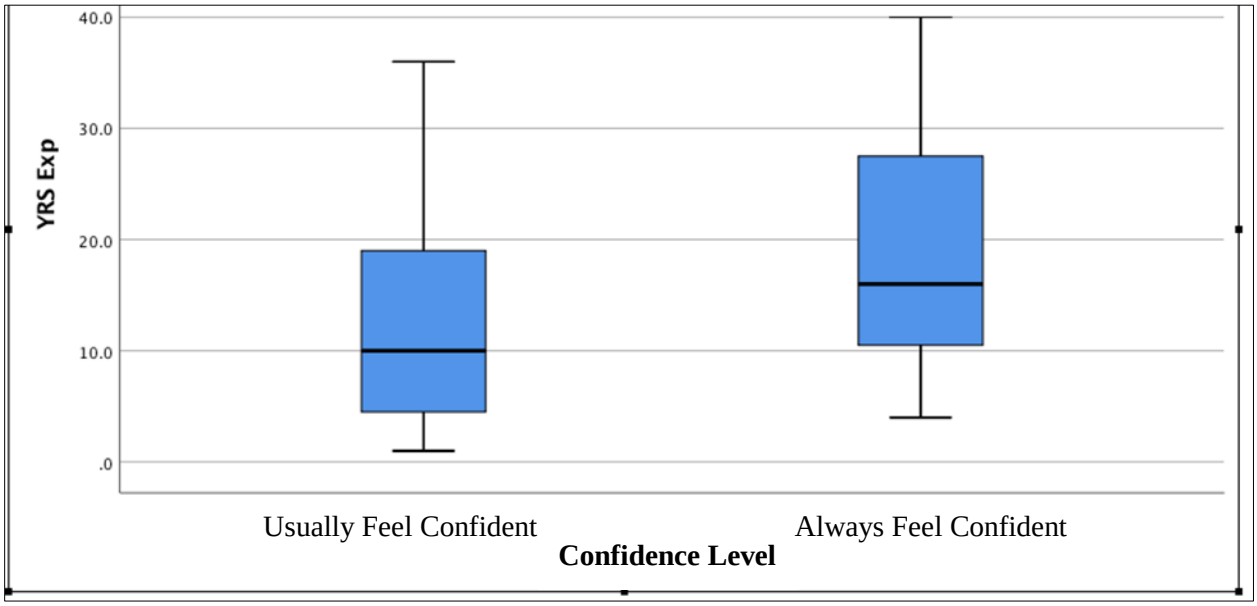
Results

Characteristics of Survey Respondents

The average number of years of experience that the sample of speech-language pathologists have in speech-language screenings of preschool-age and/or early school-age children is 14.8 years, with a standard deviation of 10.6. There was a range of 40 years – from 1 year of experience to 41 years of experience. One response was omitted due to its unclear nature. Responses that included a number of years and a plus sign, "+" (n = 2) were considered the number stated only, and for a response given with a range (n = 1), the midpoint of the range was selected.

All respondents rated their confidence level about who to refer for a full assessment following a failed screening given three options: "I rarely feel confident", "I usually feel confident", and "I always feel confident". None reported the lowest level of confidence (that they "rarely feel confident" in their ability to refer for a full assessment). With an average of 14.8 years of experience for speech-language pathologists who administer screening procedures for preschool-age children, it was expected that an individual with more experience (e.g. greater number of years) would be more confident in their ability to decide who to refer for a full assessment following a failed screening, since they have more practice in this specific skill. This relationship was explored using an independent-samples t-test to test the difference in years of experience by self-reported high (always feel confident) and moderate confidence (usually feel confident) levels. There was a significant difference in the years of experience in the years of experience for respondents who chose "always feel confident" ($M = 18.79$, $SD = 10.51$) and "usually feel confident" ($M = 13.05$, $SD = 10.22$); $t(77) = -2.274$, $p = .026$.

Relationship Between Years of Experience & Confidence



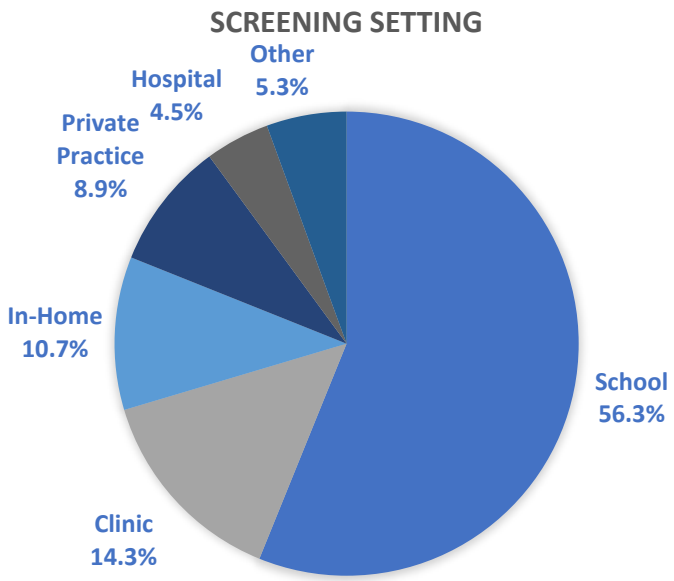
As another way of assessing confidence, a survey question asked about the self-reported confidence level of speech-language pathologists in selecting a screening tool that would yield accurate and reliable results, based on its predictive validity. Fifteen percent (15%) of respondents reported they feel “very confident”, 63.75% of respondents feel “somewhat confident”, and the remaining 21.25% feel “not very confident” in their ability to select a screening tool based on its predictive validity.

In response to a question about who administers speech-language screenings, the most common practice is that only speech-language pathologists administer the speech-language screenings (69.3%). The next most common response was that graduate students in speech-language pathology programs administer the screenings (10.9%), followed by the option that anyone who is trained in the screening procedures administers the screenings (9.90%). The remaining categories available on the survey included speech-language pathology assistants,

teachers, teaching assistants / paraprofessionals, and *anyone*, which collectively accounted for the remaining 9.9% of responses.

Logistics of Screening

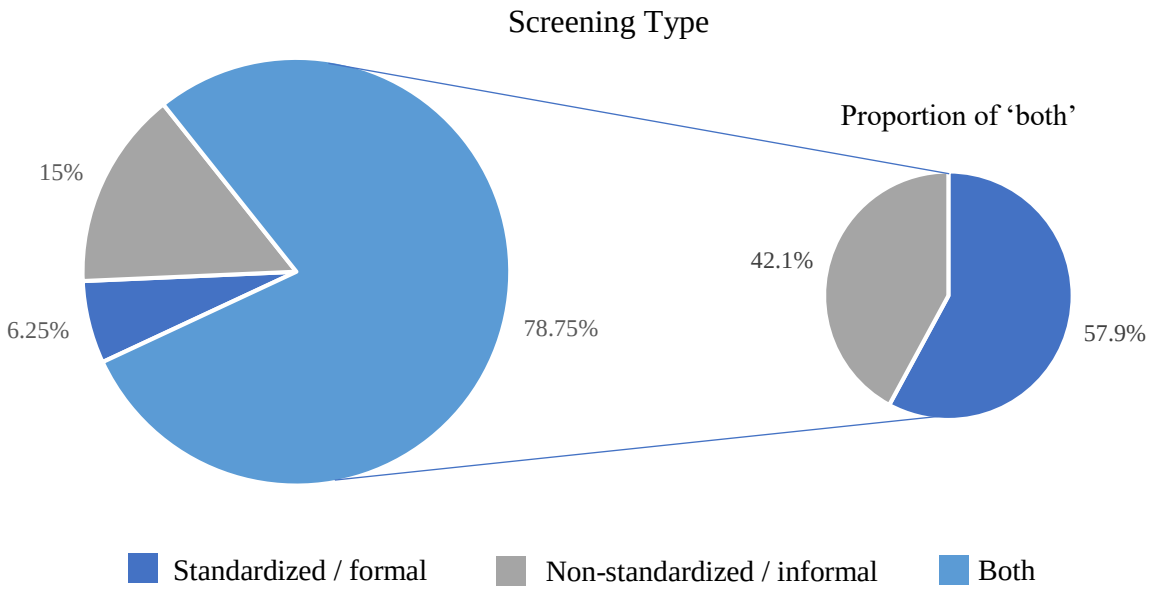
The most common setting reported where speech-language screenings occur is a school setting. The school setting accounted for 56.3% of responses, followed by a clinic setting with 14.3%, in-home setting with 10.7%, private practice with 8.9%, 'other' setting (including Head Start, daycare, community settings, and early intervention center) with 5.3%, and the hospital setting with 4.5% of responses.



One survey question asked which developmental domains are represented on the screenings for preschool-age children. The majority (62.5%) included only speech and language measures, while 37.5% included other types of developmental screening measures (e.g. cognitive, motor, social-emotional, etc.) in addition to speech-language.

Over three-fourths (78.75%) of respondents indicated that they use both *standardized – formal* procedures and *non-standardized – informal* screening procedures. Fifteen percent (15%) reported using only *non-standardized – informal*, and 6.25% reported using only *standardized – formal* screening procedures. When the respondents indicated that they use both *standardized – formal* procedures and *non-standardized – informal* screening procedures, the average percent of

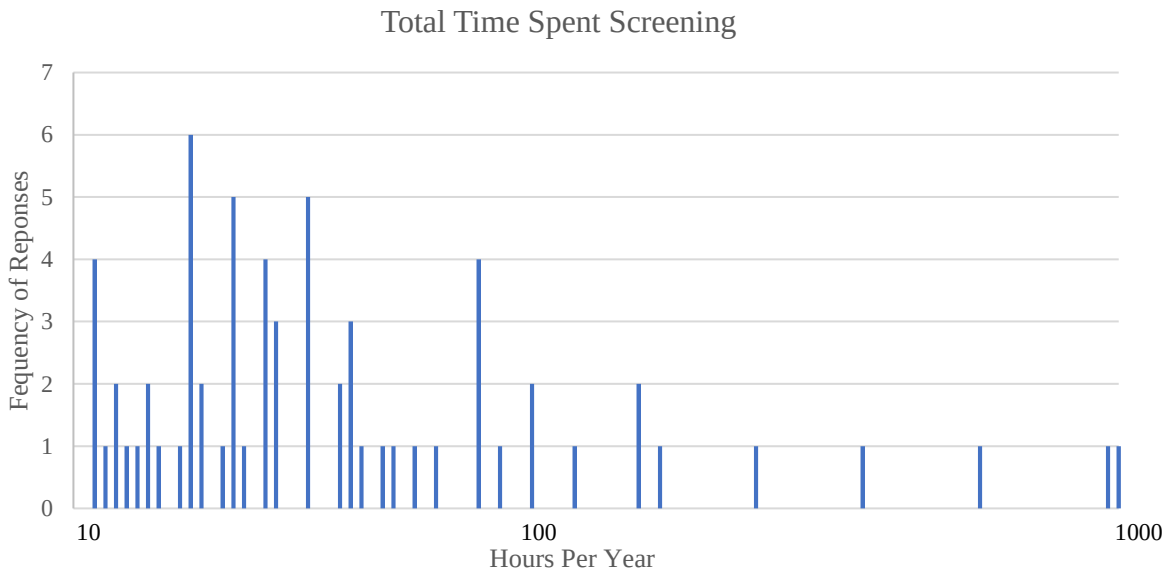
use of each of them was 57.9% for *standardized – formal* procedures and 42.1% for *non-standardized – informal* procedures.



The average time a speech-language screening takes is 23.9 minutes. To calculate the average time taken for each screening, the midpoint of number ranges was selected when a range was provided. There was a range from 5 minutes (n = 1), to 120 minutes per screening (n = 1). One respondent reported 0 minutes and indicated that the speech-language pathologist only reviews the screenings, and someone else administers the screening. The mode was 20 minutes to complete the speech-language screening procedures.

To provide a standard index for the total time spent screening, the time reported (which included hours per week, days per year, etc.) was converted to hours per year, using a seven-hour work day and a 12-month year. For any range of numbers given, the midpoint in the range was used for analysis. After omitting 15 responses for having uninterpretable values, the average hours per year that the speech-language pathologists spend screening preschool-age children was

90.4 hours (SD = 180.7). The values range from 12 hours to 1200 hours (range=1188). Since there was a wide range of responses, the mode and median were also calculated as an indication of central tendency. The most commonly reported total time spent on speech-language screenings was 24 hours per year, and the median time spent on speech-language screenings was 36 hours per year.



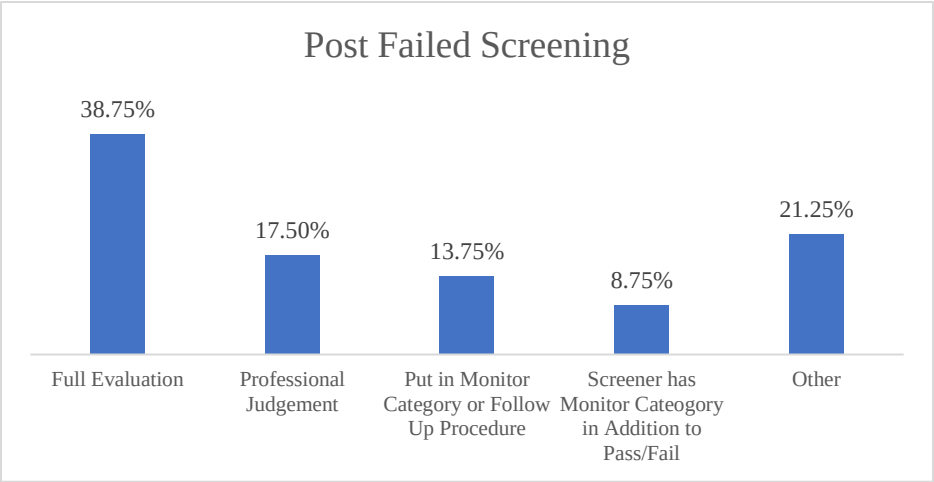
There were 34 different tools considered *standardized – formal* that were reported in the survey. The most common (n = 44) tool reported was the Preschool Language Scale (PLS). Variations of this included PLS-5 (Zimmer, Steiner, & Pond, 2011), PLS-screener, and PLS-4 (Zimmer, Steiner, & Pond, 2002). The Clinical Evaluation of Language Fundamentals, including CELF-5 and CELF-screener (Wiig, Semel, & Secord, 2013), as well as CELF-Preschool and CELF-P2 (Semel, Wiig, & Secord, 2004) were commonly reported (n = 24). The Goldman-Fristoe Test of Articulation was also commonly reported (n = 13), including the GFTA-3 (Goldman & Fristoe, 2015) and GFTA-2. At least one of these three assessments was used by 74.3% of respondents reporting any *standardized – formal* tools.

Standardized – Formal Tools Reported	Frequency
Preschool Language Scale (PLS [unspecified], PLS-5, PLS-screener, PLS-4)	44
Clinical Evaluation of Language Fundamentals (CELF [unspecified], CELF-Preschool, CELF-P2, CELF-5, & CELF-screener)	24
Goldman-Fristoe Test of Articulation (GFTA [unspecified], GFTA-3)	13
*Battelle (BDI [unspecified], BDI-2)	8
*Fluharty	7
Receptive-Expressive Emergent Language Test (REEL [unspecified], REEL-3)	7
*Developmental Indicators for the Assessment of Learning (DIAL [unspecified], DIAL-3, DIAL-4)	7
*Ages and Stages (ASQ)	5
Developmental Assessment of Young Children (DAYC [unspecified], DAYC-2)	3
Structured Photographic Articulation Test (SPAT-D [unspecified], SPAT-D3)	2
*Rossetti	2
Audiometry (Pure Tone Hearing Screening)	2
Bayley-III	1
Bracken	1
Brigance	1
CAAP-2	1
CLAMS	1
CogAt	1
Developmental Profile-3	1
EOWPVT	1
EVT	1
Full Evaluation	1
GARS	1
*HELP	1
Hodson	1
ITBS	1
MSEL-2	1
PPVT	1
RIT	1
Speech-Ease	1
TOLD	1
TOPS3	1
TPRI	1
Wiig	1

*Tools reported by some respondents as *standardized – formal* and by other respondents as *non-standardized – informal*

There was much more variability from the respondents indicating the different *non-standardized – informal* procedures they use. however, the most common responses were: speech and/or language sample (n = 24; 31.25%), articulation probing / screening (n = 14; 17.5%), and unspecified observation (n = 11; 13.75%). At least one of these three procedures was used by 52.6% of respondents reporting any *non-standardized – informal* tools.

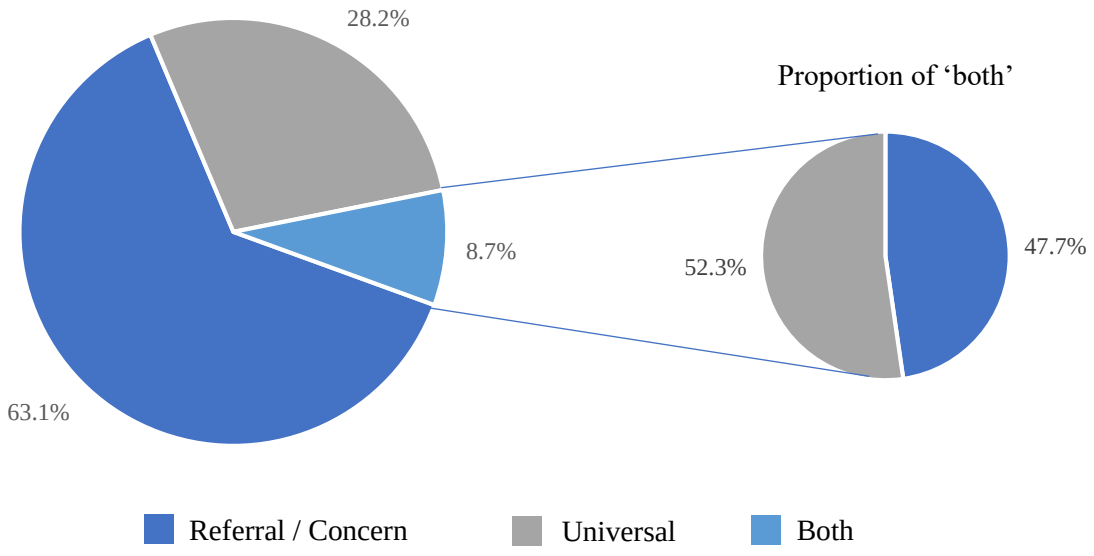
To describe what follows the speech-language screening procedures, respondents were asked about actions taken after a child failed a speech-language screening. Possible actions for a child who does not pass a screening, are: the child will receive a full evaluation (38.75%), the child may not be referred or receive full evaluation if professional judgment is that the child is developing typically (17.5%), the child will be put into a monitor category or a follow up procedure will be used (13.75%), the screener used has a "monitor" category – in addition to pass / fail – to later follow up with another screening (8.75%), and 'other' (21.25%). Write-in responses from respondents who chose the 'other' category, included explanations such as: the child being re-screened, setting up a meeting between the speech-language pathologist and the parents, home intervention strategies, a combination of the options listed, and a multi-tiered, Response to Intervention (RTI) approach.



Who is Screened and How are They Selected

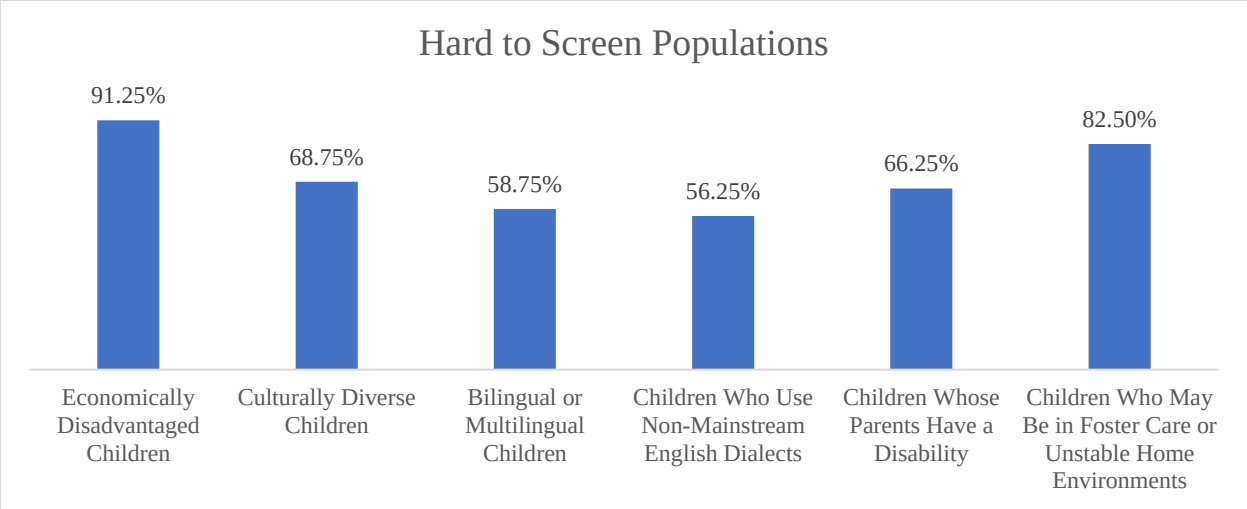
Of the reported ages of the children screened in theses speech-language screening procedures, a range from ‘2 years old’ to ‘7 years old and older’ was presented on the survey, with the most commonly screened age selected to be 4 years old (n = 73; 92.25%), falling within the preschool-age range typically considered to be 3-5 years old.

Sixty-three percent (63.1%) of respondents indicated they screen based on r*eferral or concern* only, 28.2% perform *universal* screenings, and 8.7% administer both *universal* screenings and those based on *referral or concern*. When both options – *universal* screenings and those based on *referral or concern* – were selected, the average proportion was 52.3% *universal* screening practices, and 47.7% due to *referral or concern*. Some additional information was provided by respondents who perform both types of screenings. For example, one respondent indicated that all children in kindergarten were screened, but children at other ages were screened based on *referral or concern*. Other respondents explained that there were additional motives that influenced why a child was screened, or the screenings depending on some other factor, including state-funded preschool programs and state laws.



Of the 63.1% of the respondents that screen based on *referral or concer*n only, parents and teachers account for the greatest source of referrals, at 34.6% and 33.0% respectively. Healthcare professionals accounted for 21.4% of referral sources, and 'other' for 5.5%. The respondents indicated that the speech-language pathologist is likely to follow up with the referring individual (as opposed to not following up). Speech-language pathologists are most likely to follow up with the parent (90.0%) or teacher (85.0%) and less likely to follow up with the referring individual if that person is a healthcare professional (42.5%).

All survey respondents (n = 80) indicated they work with "hard to screen populations" – i.e. at least one of the following: economically disadvantaged children (n = 73; 91.25%), culturally diverse children (n = 55; 68.75%), bilingual children (n = 55; 68.75%), children who use non-mainstream English dialects (n = 45: 56.25%), children whose parents have a disability (n = 53; 66.25%), or children who may be in foster care or unstable home environments (n = 66; 82.5%). The greatest concerns with these hard to screen populations are that false positives may result in over referral (n = 32; 40%) and false positives may result in unnecessary alarm or concern (n = 32; 40%). However, 82.5% of survey respondents indicated they do not use screening tools or procedures less often due to these concerns. Based on certain concerns (i.e. language difference [a common descriptor for children who are members of any of the above mentioned "hard to screen" populations, but particularly children who are not monolingual, standard American English speakers], lack of school readiness, cultural influence, etc.), speech-language pathologists reported being less likely (n = 77; 96.25%) to refer for (or provide) a full evaluation for a child following a failed screening if they believe that the failed status of the screening is a result of the child's status as part of a 'hard to screen' population.



Factors that Influence the Screening Process

To describe commonalities of screening procedures used around the country, the survey asked if the speech-language pathologists were aware of any national guidelines for *universal* speech-language screenings, and who governs the screening procedure(s) used by the respondents for the preschool-age children. The survey responses for who governs what screening procedure is used varied quite dramatically, but respondents indicated that the procedure is frequently determined by the school district (37.5%), state-wide regulation (25%), a supervisor (17.5%), or the individual speech-language pathologist (17.5%), with only two responses saying that no one governs this decision (2.5%; it could be assumed that the speech-language pathologist him or herself then makes the determination). Furthermore, 51.25% of respondents do not think any national guidelines for *universal* speech-language screenings for children under 5 years old; 37.5% of respondents were unsure whether such guidelines exist, and 11.25% reported that they were aware of national guidelines for *universal* speech-language screenings.

Discussion

This study focused on providing an updated description of speech-language screening practices, procedures, and tools currently used for preschool-age children. Several key findings are of interest.

This relationship between years of experience and confidence was significant in the predicted direction. For speech-language pathologists who have more years of experience, they are more confident in their ability to decide when a child needs a full evaluation. This increased confidence as a speech-language pathologist gain more years of experience could be explained through the increased knowledge and skill of the field that is learned with working for a greater number of years. While we believe that this relationship holds true, we do not know for sure that being more confident means that the speech-language pathologist will be more accurate in their speech-language screenings.

While it falls within a speech-language pathologist's scope of practice to conduct speech-language screening procedures, there are other individuals who administer screening procedures, as well. Speech-language pathologists in this sample were the individuals most likely to administer speech-language screenings, shown with almost 70% of respondents indicating this practice, which is most likely due to their specialized knowledge of the development of speech and language. Additional screening administrators that were noted, including graduate students in speech-language pathology programs, speech-language pathology assistants, teachers, and teaching assistants / paraprofessionals, have contact with children and may be aware of some speech and language development, but not to the level that certified speech-language pathologists are.

Based on previous literature and structured interviews with speech-language pathologists, the use of both *standardized – formal* and *non-standardized – informal* procedures was expected to be the most common practice. The survey results confirmed this with the clear majority (78.75%) of survey respondents indicating they use both *standardized – formal* and n *non-standardized – informal* procedures, at a close to equivalent rate (57.9% *standardized – formal* and 42.1% *non-standardized – informal)*. This practice likely exists because there is no one screening tool that is accurate and representative of all children and using both types allows for adjustment based on a child's language or cultural background to get a holistic view of a child and complete an accurate assessment.

When asked to list the different screening procedures the speech-language pathologists use, some screening procedures speech-language pathologists considered *standardized – formal*, were considered by others to be *non-standardized – informal*, and vice versa. It is important to note that the terms *standardized* and *formal* are not synonymous and neither are *non-standardized* and *informal*. However, often tools that are *standardized* are considered *formal* measures, and *non-standardized* are considered *informal*. These terms were chosen because of their common use by speech-language pathologists. For these reasons and others, it is sometimes difficult to define the classification of a pediatric speech-language screening tool as either *formal* or *informal* due to the variety of methods used to collect responses (e.g., structured testing, parent report, observation with or without presenting a stimulus), and the reference or source for interpretation (typically normative data or criteria). For example, *standardized – formal* tools—which are administered and scored in the same way and therefore outcomes can be compared to normative data—can be, and often are, used in a *non-standardized or informal* way. Similarly, several assessments that have normative data for interpretation, but rely completely on parent

report, are often considered informal. Thus, it is interesting to note that six tools that had an ambiguous classification by the survey respondents, as both *standardized – formal* screening tools and *non-standardized – informal* procedures. These tools included: ASQ, Battelle, DIAL, Fluharty, HELP, and Rossetti Infant-Toddler Language Scale (Rossetti, 2006). As an example, the Rossetti is criterion-referenced and can involve a more 'formal' elicitation of behaviors by the assessor or a more 'informal' report from the parent about the presence or absence of behaviors.

The average time reported to conduct a speech-language screening was 23.9 minutes. Screenings are meant to be quick, as a pass/fail indication to prompt further action (or not) regarding speech-language assessment of the child. If a child fails the screening, the most common action reported is for the child to receive a full speech-language evaluation. By having a short administration time, screening can be an efficient process with minimal unnecessary commitment of resources and minimal undue burden on the child. Speech-language pathologists save time and appropriately reserve the in-depth, lengthy evaluation for children who need a second look.

In terms of where speech-language screenings occur, schools are the most common setting. Compared to the ages of children that are screened this relationship aligns with the data. Preschool-age (3-5 years old) is the most common age range that is screened, which could be a possible explanation as to why schools are the most common setting. Of the individuals administering the speech-language screenings, the most common age screened is four-year olds, indicated by 92.25% of respondents. At this preschool, the children are new to the school system, as this is the year prior to entering kindergarten, making them the ideal age to evaluate the children's school readiness and ability to perform age-appropriate skills, by conducting a speech-

language screening. Four-year-olds could also be the most common age screened, because four-year-olds are also more likely to be in preschool than three-year-olds, and so this age would be seen in school enrollment more frequently, also providing a possible explanation for why schools are the most common setting where speech-language screenings occur. With this new introduction to school, the tasks being asked of these children become more difficult, asking more of their still-developing skills, such as speech and language or motor movement. These increasingly difficult task could possibly expose behavior(s) or lack of age-appropriate skill(s) regarding speech and/or language that were previously not seen, that may pose concern for the child's typical development. A more detailed discussion follows.

Prior to data collection through the survey, it was predicted that there would be more screenings based on *referral or concern* than *universal* screening procedures. In this data set, that prediction appears to be accurate with the majority (63.1%) of the survey respondents indicating that screenings are conducted based on *referral or concern* only, in contrast with 28.2% of respondents who conduct *universal* screenings, and 8.7% indicating they screen based on *referral or concern* in part, as well as *universal* screenings for a given group (e.g. children of a particular age, children entering kindergarten, etc., typically determined by state or district-level guidelines). As mentioned above, there are various factors that could influence why a child would be referred for a speech-language screening, however there are also many potential problems with this *referral or concern* only practice. By only screening based on *referral or concern*, there are some children who could slip through the cracks and not be identified as in need of a screening, when the child is actually showing signs of a speech or language problem. *Universal* screenings would help to make sure every child was accounted for and not rely upon people without specific training in speech-language development (e.g., many parents) or people

who have insufficient interactions with a child to make an appropriate judgment about speech-language development (e.g., many physicians) to notice and refer for screening. Conversely, one argument against *universal* screenings is that it takes a lot of resources (i.e., time and money) to screen all children and by allocating speech-language pathologist resources to children who show notable concern, rather than the entire population, the resources are better used.

When children are referred for a speech-language screening, the most common source of referrals a from parents (34.6%) and teachers (33.0%). A possible explanation for these individuals being the most common referral sources, is that parents spend the most time with their children and would notice these possible concerns. On the other hand, teachers may be a large referral source as well, because they spend a lot of time with the children, and they are knowledgeable about typical speech-language development and would be aware of when a child strays from this.

Included in the screening procedures that respondents reported, 62.5% included only speech and language measures, and the other 37.5% included other types of developmental screening measures (e.g. cognitive, motor, social-emotional, etc.). Since the survey respondents were all speech-language pathologists, this would make sense that they were primarily conducting only the speech-language screenings, while other professions (e.g. psychologists, physical therapists, occupational therapists, teachers, etc.) would oversee the other developmental screening measures.

Every survey respondent (n = 80) indicated that he/she works with individuals who are classified as being a “hard to screen population”, shows the greater need for *standardized – formal* screening procedures for non-mainstream English languages or English/Spanish bilingual speakers.

All respondents indicated that they work with “hard to screen” populations, which can be explained by the heterogeneity of the United States. One of the aims of this study was to describe the relationship between working with these hard to screen populations and the use of *non-standardized – informal* screening procedures. It was expected that the use of *non-standardized – informal* screening procedures would be greater among speech-language pathologists who work with “hard to screen populations – in particular, bilingual/multilingual children, and/or users of non-mainstream English dialects, but this relationship did not exist. Because the clear majority (93.5%) of respondents indicated they use *non-standardized – informal* screening, and all respondents work with hard to screen populations, the lack of variability did not allow for exploration of this relationship.

Exploring the various factors that govern what screening procedures are used for speech-language screenings, the majority of respondents (88.75%) are either not aware of the existence of any national guidelines for whether universal speech and language screening should be mandated for children under 5 years old or unsure of whether such guidelines exist. This is consistent with the current United States Preventive Service Task Force (USPSTF) recommendation, with no recommendation for or against *universal* screening due to the lack of evidence that supports the effectiveness of the practice of *universal* screening. Of the responses for who governs what screening procedure is used for preschool-age children, responses included the school district, state-wide regulation, a supervisor, and the individual speech-language pathologist. While it is good that there is some governing body to make these calls, it is still not nationwide regulation. State-wide and district-wide regulation is good for the children in those states and districts, but we are still missing nationwide regulation, to account for all children. According to the current USPSTF (2006) recommendation, the data for the usefulness of

screening for improving speech and language outcomes is not strong enough. However, early intervention tends to be effective for facilitating the best outcome for the speech and language development of these children (Law, et al., 2000) and early intervention cannot be provided without early identification. The study aimed to complete a first step, description of current practices, in the process of gathering the data needed to make evidence-based recommendations for preschool speech-language screenings.

Future Directions

The survey results described in this study demonstrate the wide range of practices involved in preschool-age speech-language screenings. This variability is evident in different populations being screened, how screening decisions are made, the settings and screening administrators, the procedures and tools being used, logistics of the specific screenings, and various other factors that influence the screening process.

Specifically, there is a present need to develop *standardized – formal* screening procedures for multilingual children, non-English speakers, and users of a non-mainstream English dialects. The lack of *standardized – formal* tools for these populations leads to increased use of *non-standardized – informal* screening procedures, which rely on professional judgement for interpretation much more so than *standardized – formal* tools and may lead to variable interpretations. This use of professional judgement rather than relying on *standardized – formal* tools alone also reflects speech-language pathologists lack of confidence in current screening tools' ability to accurately identify children with typical and atypical language development.

Additionally, the results highlight a lack of clear transmission of information to the care providers. Nearly four in ten speech-language pathologists reported being unaware of whether

national guidelines for screening existed and, in fact, they currently do not. With a lack of national guidelines and uniform screening procedures, it seems that every speech-language pathologist is on their own when it comes to preschool-age speech-language screening procedures.

Although there was a variety of screening tools and procedures reported in this study, it is very interesting that among the variety, there was still a 'core set' of practices used by most speech-language pathologists. At least one of the three most commonly reported *standardized – formal* screening tools – the Preschool Language Scale (PLS), including variations such as PLS-5 (Zimmer, Steiner, & Pond, 2011), PLS-screener, and PLS-4 (Zimmer, Steiner, & Pond, 2002), the Clinical Evaluation of Language Fundamentals, including CELF-5, CELF-screener (Wiig, Semel, & Secord, 2013), CELF-Preschool, and CELF-P2 (Semel, Wiig, & Secord, 2004), and the Goldman-Fristoe Test of Articulation including the GFTA-3 (Goldman & Fristoe, 2015) were used by 74.3% of respondents reporting the use of any *standardized – formal* tools. On the other hand, for *non-standardized – informal* procedures reported, and least one of the three most commonly reported procedures – speech and/or language samples, articulation probing / screening, and unspecified observation – were used by 52.6% of respondents reporting any *non-standardized – informal* screening procedures, showing that even with great variability in the screening practices used, there are still a 'core set' of practices commonly selected from.

Further research is needed to investigate preschool-age speech-language screening procedures. Specifically, a current review of the psychometric properties of the specific *standardized – formal* screening procedures tools used by almost three-quarters of speech-language pathologists who used any *standardized – formal* tools is warranted. It was noted that with hard to screen populations, there are few *standardized – formal* screening procedures that

can accurately screen these individuals, and typically *non-standardized – informal* procedures are used. For the *standardized – formal* tools that do exist, a current review of the psychometric properties of those tools would also be quite helpful. If the validity of available tools is less than desirable, the field would likely benefit from well-designed *standardized – formal* tools developed for some of the more common hard-to-screen populations, to enhance consistency and accuracy in screening these children.

Challenges

With survey respondents indicating that they reside in 32 different US states, this sample provides a snapshot of speech-language screening procedures throughout the country. However, with a small convenience sample of 80, there was a limitation in the extent that the results could be generalized to the larger population of speech-language pathologists. Due to being constrained by money and time, the small sample of survey responses serves as a descriptive study, with limited ability to generalize to the larger population of speech-language pathologists. However, there are several valuable contributions here that can provide a foundation for future research.

Conclusion

The high prevalence of speech and language delays and disorders in school-age children shows the need for accurate identification and appropriate early intervention. There are studies regarding the positive impact of this intervention, and the effectiveness of treatment provided. However, research is lacking when it comes to the identification of these children – which is where this study comes in. This study provided an updated, comprehensive description of speech-language screening procedures for preschool-age children. This information needs to be available, in a current and accurate manner, in order to be accessible to speech-language pathologists to guide their practice.

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Appendix A

Copy of the survey

Preschool-Age Speech and Language Screening Procedures

https://cuboulder.qualtrics.com/jfe/form/SV_4ORZ82kcTVBSukl

You will take an online survey, containing roughly 25 questions, ranging from multiple choice to short answer. The survey should take 15-20 minutes and can be completed at any time during the month of June. This survey is voluntary and responses will be confidential. You will be compensated $10 via electronic Amazon gift card for your participation. Once the data has been collected, your identifying information (email address) will be removed and only used for compensation purposes. This survey has been approved by the University of Colorado-Boulder Institutional Review Board (IRB Protocol Number: 18-0255). By pressing the blue arrow below, you are providing your consent. If you have any questions, please contact Christina Meyers-Denman at christina.meyers@colorado.edu.

1. I am a certified Speech-Language Pathologist who administers preschool-age speech and language screenings.

○ Yes

○ No

2. How many years of experience in **speech and language screenings** of **preschool-age and/or early school-age children** do you have?

_____

3. What ages of children do you screen? (Select all that apply)

- ☐ 2 years old and under
- ☐ 3 years old
- ☐ 4 years old
- ☐ 5 years old
- ☐ 6 years old
- ☐ 7 years old and older

4. What setting do you administer the speech and language screening in? (Select all that apply)

- ☐ School
- ☐ Private practice
- ☐ In home
- ☐ Clinic
- ☐ Hospital
- ☐ Other _____

5. How much of your total time as a SLP is spent on screening activities? (e.g. hours per month or days per year, etc.)

_____

6. Who administers these speech and language screenings? (Select all that apply)

- [ ] SLPs only
- [ ] SLPAs
- [ ] Grad students
- [ ] Teachers
- [ ] Anyone who is trained in the screening procedures
- [ ] Anyone
- [ ] Teaching Assistants / Paraprofessionals

7. What types of screening procedures do you use?

- ○ Standardized / formal
- ○ Non-standardized / informal
- ○ Both

8. If you selected 'both" in the question above, please enter an approximate percent of each of the types of screening procedures used. (Please make sure the percentages add up to 100%)

- ○ Standardized / formal _____
- ○ Non-standardized / informal _____

9. Please list specific standardized / formal tools that you use on a regular basis.

_____

10. Please list specific non-standardized / informal screening procedures that you use on a regular basis.

_____

11. On average, how much time (in minutes) does each screening take?

_____

12. How would you describe your use of screening procedures? (Select all that apply)

- ☐ Universal (i.e. all children in a given group/school/age range are screened)
- ☐ Based on referral or parent/teacher/physician concern only
- ☐ Other / It depends (please describe) _____

13. If you selected both 'universal' and 'based on referral' above, please indicate the approximate percent of each type. (Please make sure the percentages add up to 100%)

- ○ Universal _____
- ○ Based on referral _____

14. If a child is referred for speech-language screening, who refers the child? (Select all that apply)

☐ Healthcare professional

☐ Parents

☐ Teachers

☐ Other (please describe) _____

☐ None of the above; I only perform universal screenings

☐ None of the above; if a child is referred, he/she receives a FULL EVALUATION, not a screening

15. How often do you talk to the person who referred the child? (Select all that apply)

- ☐ I never talk to the parent
- ☐ I sometimes talk to the parent
- ☐ I always talk to the parent
- ☐ I never talk to the teacher
- ☐ I sometimes talk to the teacher
- ☐ I always talk to the teacher
- ☐ I never talk to the Healthcare professional
- ☐ I sometimes talk to the Healthcare professional
- ☐ I always talk to the Healthcare professional

16. Does the screening procedure that <u>you</u> administer include speech and language measures only, or are other types of developmental screening (i.e. cognitive, motor, social-emotional, etc.) as well?

- ○ Speech and language only
- ○ Speech-language and other measures

17. What are the possible actions for a child who **does not pass** the screening?

- ○ If a child fails, he or she will receive a full evaluation
- ○ If a child fails, he or she will be put into a monitor category or another follow up procedure will be used
- ○ The screener I use has a monitor category (in addition to pass/fail) to later follow up with another screening

○ If a child fails, he or she may not be referred for evaluation if professional judgment is that the child is developing typically

○ Other (please describe) _____

18. Do you work with any of the following populations? (Select all that apply)

☐ English language learners (i.e. bi/multilingual children)

☐ Speakers of non-mainstream English dialects (e.g. African American English)

☐ Children from disadvantaged or low SES backgrounds

☐ Children from diverse cultural groups

☐ Children whose parents have a disability

☐ Children who may be in foster care or unstable home environments

☐ Other (please describe) _____

19. Some populations can be difficult to screen using typical screening procedures. Which of the following concerns do you have with the populations listed in the question above? (Select all that apply)

☐ Not accurate for the populations I work with

☐ No adapted or standardized tools appropriate for these populations

☐ The interpretation of non-standardized tools is difficult for these populations

☐ False positives may result in over referral

☐ False positives may result in unnecessary concern or alarm

☐ False positives may result in wasted time, finances, or other resources

- [ ] Procedures are not accurate enough in general for any population to justify their use
- [ ] Loss to follow up is highly likely, thus universal screening is not an effective practice
- [ ] Screening takes too long / I do not have the time
- [ ] The screening process is not adequate and should be replaced by a full assessment for children who have been referred by medical professionals
- [ ] The screening process is not adequate and should be replaced by a full assessment for children who have other risk factors not mentioned above
- [ ] The screening process is not adequate and should be replaced by a full assessment for children who do not fit in the mainstream population
- [ ] Other (please describe) _____

20. Do any of the concerns you indicated above lead you to use screening tools or procedures less often or not at all?

- ○ Yes
- ○ No

21. I am less likely to refer for (or provide) a full evaluation for a child following a failed screening, if I think the failed status is a result of... (Select all that apply)

- [ ] Language difference (e.g. bi/multilingualism or non-mainstream English dialects)
- [ ] Result of another disability (e.g. physical impairment)
- [ ] Lack of rapport with the person administering the screening
- [ ] Lack of school readiness (e.g. first formal school experience)
- [ ] Cultural influence
- [ ] Possibly impoverished home language environment
- [ ] Other _____

22. How confident do you feel in your ability to decide who to refer for a formal assessment?

- ○ I rarely feel confident
- ○ I usually feel confident
- ○ I always feel confident

23. Who governs what screening procedures you use? (e.g. state-wide guideline, school district, supervisor, etc.)

_____

24. Are you aware of any national guidelines for whether universal speech and language screening should be mandated for children under 5 years old?

- ○ Yes
- ○ No
- ○ Not sure

25. Please describe the following terms in your own words with respect to screening tool psychometrics.

- ○ Specificity _____
- ○ Sensitivity _____
- ○ Predictive validity _____

26. How confident do you feel with your ability to select a screening tool based on its predictive validity?

- ○ Not very confident
- ○ Somewhat confident
- ○ Very confident

27. Please provide your email address for compensation purposes. We will email you a link for a $10 Amazon gift card within a few days.

- ○ Email address _____
- ○ State (optional) _____

28. Would you be willing to be contacted for a follow up interview? If so, please enter your contact information below. Your contact information will not be associated with your survey responses.

○ Name _____

○ Email address _____