What Influences Speech Language Pathologists' Use of Different Types of Language Assessments for Elementary School-Aged Children?

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Abstract

Purpose: This study reports on data from a survey of SLP language assessment practices for elementary school-aged children. The objective was to investigate the regularity with which SLPs use different types of assessments (described across data types, task types, environmental contexts, and dynamic features). This study also investigated factors that influence assessment practice, the main sources from which SLPs obtain information on language assessment and the main challenges reported by SLPs in relation to language assessment.

Method: A web-based survey was used to collect information from 407 Australian SLPs regarding the types of assessments they use. Factors that influenced the regularity with which different types of assessments were used were investigated using regression analysis.

Results: Most SLPs regularly used assessments that are norm-referenced, de-contextualized, and conducted in a clinical context and less regularly used other types of assessments. Service agency, Australian State, and SLPs years of experience were found to influence the regularity with which some types of assessments were used. Informal discussion with colleagues was the most frequently identified source of information on assessment practice. Main challenges related to limited time, lack of assessment materials and lack of confidence in assessing children from culturally and linguistically diverse backgrounds.

Conclusion: SLPs could improve current language assessment practice for elementary school-aged children through more regular use of some types of assessments. Actions to facilitate evidence-based assessment practice should consider the contextual differences that exist between service agencies and states and address challenges that SLPs experience in relation to language assessment.

What Influences Speech Language Pathologists' Use of Different Types of Language Assessments for Elementary School-Aged Children?

Language disorder is identified when a child has persistent difficulties with spoken and written language with these difficulties impacting on performance and participation in everyday activities (Bishop et al., 2017). The functional limitations of language disorder may become particularly apparent at school; therefore, speech language pathology (SLP) services in the elementary school years are important for maximizing educational outcomes (Norbury et al., 2016). Given that interventions and supports for children are determined based on assessment data, it is vital that attention is placed on the types of assessments that speech language pathologists (SLP)s use when assessing the language abilities of elementary school-aged children (Caesar & Kohler, 2007, 2009; Eadie, 2003).

Evidence-based practice identifies that SLPs should use a range of different assessments when evaluating the language abilities of elementary school-aged children (Bishop et al., 2016). This includes use of assessments that collect different types of data, such as norm-referenced versus criterion-referenced/descriptive data (Caesar & Kohler, 2009; Denman et al., 2019). Measures with norm-referenced data provide important information on a child's language abilities in relation to peers; however, these measures are not suitable for use with particular client groups, particularly children from culturally and linguistically diverse (CALD) backgrounds (Caesar & Kohler, 2007). Research also identifies that currently available norm-referenced measures may have limitations with regards to diagnostic accuracy, which necessitates a need for data from these measures be supplemented with data from other types of assessments to reduce the risk of under-identifying less overt language difficulties (Denman et al., 2017).

The International Classification of Functioning, Disability and Health provides a framework for health professionals when gathering data on the needs of clients (World Health Organisation, 2002). The ICF provides a framework for describing health and wellbeing across multiple components including Body Functions and Structures (impairment), Activities (execution of tasks), Participation (involvement in daily life activities), Environmental Factors and Personal Factors and as such, has been identified as an important framework for conceptualizing SLP assessment practice. Applying the ICF requires SLPs to use assessments that collect data on a child's performance in different types of tasks, such as de-contextualized, contextualized or activity-focused tasks (Denman et al., 2019; Harlaar et al., 2016) and on a child's performance across different environmental contexts, including a clinical context, school context or home/community context (Denman et al., 2019; Kover et al., 2014) in order to best understand a child's language performance at a holistic level (Westby, 2007). This is important as children may perform differently depending on the types of tasks targeted in an assessment (Thomas-Stonell et al., 2013; Trembath et al., 2016). For example, numerous studies have identified that children may perform differently on de-contextualized measures, such as single word vocabulary tests, when compared with contextualized procedures such as 'language sampling' (Ebert & Scott, 2014; Harlaar et al., 2016; Ukrainetz & Blomquist, 2002). Similarly, a lack of concordance between relationships in language performance as measured in clinical contexts versus school and home/community contexts, indicating that a child's communicative competence may vary depending on the environmental context in which abilities are assessed (Bishop & McDonald, 2009; Kover et al., 2014).

It is also important that SLPs incorporate dynamic procedures when assessing children, as opposed to using assessments that are purely static in nature (Denman et al., 2019; Olswang & Bain, 1996). Dynamic procedures may be described as gradual prompting,

test-teach-retest or both (Westby, 2007). Incorporating dynamic procedures into the assessment process offers advantages over use of static procedures alone, as dynamic procedures provide information on the level of support a child requires to learn language skills or the type of support a child needs to successfully participate in everyday activities (Olswang & Bain, 1996; Westby, 2007). A list of terms and definitions for describing the features of different types of language assessments is provided in Supplementary Material 1.

To identify the extent to which evidence-based assessment practice recommendations are implemented by SLPs, survey data are needed regarding current SLP assessment practices. Previous surveys of SLP assessment practice have been conducted, however these surveys focused on particular clinical populations, particular groups of SLPs or the use of a single type of assessment. For example, previous surveys have examined assessment for children from culturally and linguistically diverse (CALD) backgrounds or children with specific disabilities (Arias & Friberg, 2015; Caesar & Kohler, 2007, 2009; Teoh et al., 2017; Watson & Pennington, 2015; Williams & McLeod, 2012). Other surveys have examined assessment practices of SLPs employed in schools in the United States of America (Beck, 1995; Caesar & Kohler, 2009; Fulcher-Rood et al., 2018; Wilson et al., 1991) or investigated SLPs use of a single type of assessment, such as norm-referenced measures or contextualized procedures such as “language sampling” (Betz et al., 2013; Huang et al., 1997; Kemp & Klee, 1997; Ogiela & Montzka, 2020; Westerveld & Claessen, 2014). Whilst these previous surveys provide valuable information on specific aspects of SLP assessment practice, it is not known if findings from these surveys are generalisable to SLP assessment practice at a broader level. No previous survey has explicitly examined SLP use of assessments with different data types, task types, environmental contexts and dynamic features. Therefore, collecting information on the range of different types of assessment SLPs use when assessing

children across their whole caseloads will provide important and new information on current SLP assessment practice.

To understand current SLP practice, information is also needed regarding the factors that may influence SLP assessment practice (Fulcher-Rood et al., 2018). These factors are likely to be complex, however may include factors related to service agency or location, individual SLPs, or type of clinical caseload (Flottorp et al., 2013). Although previous surveys have investigated the language assessments SLPs use in clinical practice, there is paucity of information on the factors that influence the types of language assessments SLPs use when assessing elementary school-aged children (Fulcher-Rood et al., 2018). Collecting this information is important for identifying actions that may support evidence-based language assessment practice into the future.

Across most English-speaking countries, SLP services for elementary school-aged children are provided by a wide range of different service agencies with each agency having different jurisdictions, funding sources, policies and role descriptions (Rosenfeld, 2002; Speech Pathology Australia, 2014). Service availability and provision may also vary between metropolitan and regional/rural locations (Ruggero et al., 2012). It is possible that the regularity with which different types of assessments are used by SLPs may vary by service agency or geographical location, however this has not been investigated.

It is also possible that the types of assessments SLPs use is influenced by SLP years of working experience or level of qualification. No previous studies have explicitly examined the influence of SLP level of qualification on assessment practice. Years of working experience has not identified in previous studies as a factor that directly influences the assessments SLPs use (Caesar & Kohler, 2007; Hux et al., 1993; Pavelko et al., 2016; Roulstone et al., 2015), however it has been identified that SLPs with more years of experience may be more likely to assess across multiple contexts, create their own assessment

protocols or draw on their own judgement when interpreting assessment results (Caesar & Kohler, 2007; Pavelko et al., 2016; Wilson et al., 1991). As previous surveys have been limited to investigations of single types of language assessments, further surveys are needed to further examine the influence of SLP level of qualifications and years of working experience on a broad range of different types of assessments.

The majority of norm-referenced language measures are normed with a population of monolingual English speaking children and are thus not suitable for children from CALD backgrounds (Arias & Friberg, 2015), therefore it is expected that the types of assessments SLPs use may vary depending on the proportion of children on SLP caseloads from CALD backgrounds. Only one previous study has examined SLP language assessment practices in relation to the proportion of children from CALD backgrounds on SLP caseload (Caesar & Kohler, 2007). This study did not identify differences between groups in relation to the types of assessments used by SLPs. However, assessment practice for children from CALD backgrounds may be changing over time (Arias & Friberg, 2015), therefore there is a need for new studies examining current assessment practice.

Information on the sources from which SLPs obtain knowledge on language assessment practices and the main challenges SLPs experience in relation to child language assessment is valuable for understanding the barriers that SLPs experience in clinical practice. This information is also useful for identifying successful avenues for disseminating future practice recommendations. Previous studies have identified that SLPs tend to rely on peers or workshops rather than journal articles for information on assessment practice (Beck, 1995; Wilson et al., 1991). Other surveys focusing on assessment of children from CALD backgrounds and SLPs use of a contextualized assessment (e.g., language sampling) identified that SLPs experience challenges related to limited time, resources and training (Arias & Friberg, 2015; Guiberson & Atkins, 2012; Kemp & Klee, 1997; Pavelko et al.,

2016; Teoh et al., 2017; Westerveld & Claessen, 2014). Only one older study has examined the challenges experienced by SLPs in different work agencies (Huang et al., 1997). As these previous studies all targeted specific populations or types of assessments or were conducted more than 20 years ago, further current data regarding sources of information and challenges experienced by SLPs is needed relating to the broader population of SLPs.

In summary, evidence-based practice recommendations identify that SLPs should collect data from a range of different types of assessments when assessing the language abilities of elementary school-aged children. To understand the extent to which SLP's use different types of language assessments, further survey data is needed to examine the regularity with which SLPs use assessments that collect different types of data, assess different tasks and environmental contexts, and have dynamic features. Obtaining this information will assist in identifying the alignment between evidence-based practice and SLP's actual clinical practice when assessing the language abilities of elementary school children (Eadie, 2003).

Investigations are also needed to examine if factors such as service agency, geographical location, years of experience, SLP qualifications or proportion of children on SLP caseloads with CALD backgrounds influence the types of assessments SLPs use. A better understanding is also needed regarding the sources from which SLPs obtain information on assessment practices and the challenges that SLPs experience when assessing the language abilities of children. This information will assist with identifying future actions to support implementation of evidence-based practice recommendations by SLPs (Fulcher-Rood et al., 2018).

Objectives

The aim of this study was to collect information on SLP language assessment practices for elementary school-aged children. Findings from the study are relevant to all

SLPs who work in the field of child language, particularly SLPs who work in school settings with large caseloads of children with language disorder. The specific objectives of the study were:

1. To determine the regularity with which SLPs use the following types of assessments when assessing the language abilities of children aged 4-12 years: different data types (norm-referenced or criterion-referenced/descriptive), different task types (de-contextualized, contextualized or activity-focused), different environmental contexts (clinical, school or home/community) and assessments with dynamic features (gradual prompting or test-retest procedures).
2. To identify if the following factors influence the regularity with which different types of language assessments are used by SLPs to assess the language abilities of children aged 4-12 years: service agency, years of experience, SLP qualifications, proportion of children from CALD backgrounds on SLP caseload or geographical location in terms of Australian state and remoteness area classification.
3. To identify the main sources of information that SLPs from different agencies report most frequently obtaining information on child language assessment.
4. To identify the main challenges that SLPs in different agencies most frequently report experiencing in relation to child language assessment.

To allow for variables such as service agency and geographical location to be investigated in the absence of possible variations that may exist across countries, this study was restricted to one English-speaking country. Australia has wide diversity with regards to the range of service-agencies and geographical locations in which SLPs are employed to provide services to school-aged children and was thus identified as being well-suited as a location for this survey. As SLP services across English-speaking countries would not be expected to differ significantly, findings from this survey have relevance to SLPs internationally.

Methods

This study used an online survey created with Qualtrics software (Qualtrics, 2005) to collect data from SLPs regarding the types of language assessments they use. Ethical approval to conduct the survey was obtained from the Curtin University Human Research Ethics Committee (Approval Number: HRE2017-0659.). In accordance with Ethics Approval Guidelines, survey participants were provided with information on the survey prior to undertaking the survey and were required to indicate consent to participate before accessing the survey content.

Survey Structure and Format

The survey consisted of four sections. A copy of the survey questions is provided in supplementary material 2. To assist in determining the size of the sample population, all Australian SLPs were eligible to complete the first section of the survey, regardless of their area of practice. This first section of the survey consisted of questions about Speech Pathology Australia association membership and participant demographics. These questions were multiple choice questions with open text boxes for participants to list 'other' options.

The remaining survey sections were completed by SLPs who indicated that they provided a service to at least 40 children with language disorder in the last year. The second section of the survey asked questions about the service agency in which SLPs work and the proportion of children on their caseload from CALD backgrounds. SLPs were also asked to indicate the main (up to four) challenges they experience when assessing children with language disorder and the main (up to three) sources from which they obtain information about assessment practices. The questions in this second section were multiple choice questions with open text boxes for participants to list 'other' options or questions with a Likert scale response. Participants were restricted to selecting four challenges and three sources of information as the research objective was to identify the main or primary

challenges that SLPs experience, as opposed to all the challenges SLPs experience. Allowing participants to select more than this number of options may have resulted in participants selecting other challenges that were not main challenges. Multiple choice response options for questions related to challenges SLPs experience and sources of information were informed by previous literature in the field regarding possible challenges and sources from which SLPs obtain information. An "other" option was provided for SLPs to add responses that were not included as response options.

The third section of the survey asked about the regularity with which SLPs used different types of assessments when assessing the language abilities of elementary school-aged children. These questions asked for Likert scale responses. The fourth section of the survey asked questions related to the names of actual language measures and assessment procedures used by SLPs and results from this section will be reported in a separate publication.

To ensure consistent descriptions of different types of assessments between participants, careful consideration was given to the terminology used within the survey questions. The terms used were those agreed upon in a previous consensus study (Denman et al., 2019) and participants were instructed to apply these definitions when answering questions, even if they use the terms differently themselves. All questions in the survey regarding types of assessments used were accompanied by examples of assessments that were described in each question. A supplement with further examples was also provided for participants to refer to during the survey if they required further clarification as to how different assessments are described.

To ensure consistent application of the frequency rating scale, Likert scale points were associated with descriptors, as well as numeric qualifiers (Blais & Grondin, 2011). For example, participants were asked "How many children were assessed in a school context

(considering the last 40 children assessed)?" rated on a Likert scale of 'most' = 34 or more children, 'many' = between 20-34 children, 'some' = between 6-19 children, 'few' = less than 5 children or 'none' = no children. The reference number of 40 was selected because it was considered large enough to capture trends across SLPs general caseload, but still small enough for participants to accurately recall the types of assessments they used.

Prior to the survey being distributed, four SLPs piloted the survey and provided feedback. These participants were sourced through electronic mailing lists and the professional networks of the researchers. Pilot participants were from the Australian states of Queensland or New South Wales and were all from different service agencies, including a public education (school) service, private practice, a non-government disability service agency and a university clinic.

Survey dissemination

The survey was open for four months between mid-February and mid-June 2018 and was advertised through the Speech Pathology Australia national newsletter sent monthly to all association members. The survey link was also circulated on Twitter, Facebook and emailed through professional networks of the researchers, publicly available email addresses, and email discussion groups. SLPs who received the survey link were asked to forward the link to colleagues. The survey was estimated to take 5 minutes for SLPs who only completed the first section and between 25-40 minutes for SLPs who completed all four sections. Participants were able to complete the survey in more than one sitting as the survey could be saved and opened again later.

Data Analysis

Survey responses were imported into the Statistical Package for the Social Sciences (SPSS) version 20 program (IBM Corp, Released 2011). State and remoteness area classification were assigned from the postcodes provided by survey participants. Remoteness

area was classified by the Australian Statistical Geography Standard (ASGS) developed by the Australian Bureau of Statistics (Australian Bureau of Statistics, 2016). Remoteness area was collapsed into two categories 'major city' (ASGS category of major city) and 'regional-remote' (ASGS categories of inner regional, outer regional, remote, and very remote).

Descriptive statistics were used to examine the frequency with which SLPs use each type of assessment, the main challenges reported by SLPs, and the main sources of information on assessment reported by SLPs. For multiple choice options, responses supplied by participants in open text boxes were coded to an existing response option if applicable or coded as a new response option. Chi Square tests were used investigate differences between groups of SLPs. Backward elimination binary logistic regression analyses were used to investigate the factors that influence the frequency with which each type of assessment was used by SLPs (Sperandei, 2014).

To create binary dependent variables for regression analysis, Likert scale responses were transformed into variables with two response categories: regularly (options 'many' or 'most') or not regularly (options 'none', 'few', 'and 'some'). This means that regular use of an assessment was identified if an SLP reported using the assessment with 20 or more of the last 40 children assessed (i.e., half or more children). Independent variables were state, service agency, years since graduation, SLP's qualifications, remoteness area classification and proportion of children from CALD backgrounds. Due to the small numbers of survey participants in Tasmania, Northern Territory and Australian Capital Territory, the 32 participants from these three states and territories were removed from regression analysis (objective 2) to improve the sensitivity (Sperandei, 2014). Consequently, the sample size was n=407 for all analyses except regression analysis where sample size was n= 375.

To reduce the initial number of variables in the multivariate regression analyses, a pre-selection process was employed by using a series of univariate Chi-square tests

(Sperandei, 2014). Only variables with X^2 p-value of less than 0.1 in the univariate pre-selection were included in the multivariate logistic regression models. The variables that best contributed to the regression models were then identified through a backward elimination process. This occurred by conducting logistic regression with all the pre-selected variables and removing non-significant variables one by one (starting with the least significant variable) until only the variables that significantly contributed to the model remained.

Reference groups are the categories in each variable to which other categories are compared for statistical significance during regression analysis (Sperandei, 2014). The reference groups in this analysis were 'New South Wales (NSW)' for state, 'private practice' for service agency, '0-2 years' for years since graduation, 'Bachelor of SLP with no additional qualifications' for SLP qualifications and 'major city' for remoteness area classification. Reference groups were chosen as groups with the largest sample size, or in the case of years since graduation, for ease of interpretation by taking the lowest category in the scale (Sperandei, 2014). NSW was selected as the reference group as this state had both a large sample size and the most evenly distributed population across subcategories of other variables, particularly service agency.

Results

Survey Responses

In total, 847 SLPs consented to take part in the survey, with 727 providing complete and valid survey responses (85.8% completion rate). Of the SLPs who completed the survey, 83.4% identified themselves as being members of the national speech pathology association (Speech Pathology Australia). This figure is comparable with the 80% estimate obtained in a previous survey of Australian SLPs (Westerveld & Claessen, 2014). Personal communication with Speech Pathology Australia about its membership database indicated that approximately 53% of qualified Australian SLPs who are members of the association worked with

elementary school-aged children (L. Young, personal communication, 4th June and 20th September 2018). Using 83% as an estimate of association membership and 53% as an estimate of the proportion of SLPs who work with children aged 4-12; we calculated that 4,610 SLPs in Australia work with children aged 4-12 years. In this survey, 525 SLPs identified themselves as working with children aged 4-12 years, with this response rate representing 11.4% of the estimated population. As data on association membership were also available per state, it was approximated that between 7.7% and 40.1% of the estimated number of SLPs in each Australian state who work with elementary school-aged children completed the survey. The number of SLPs surveyed in relation to the estimated population for each state/territory is provided in supplementary material 3.

An estimate of the number of Australian SLPs who frequently work specifically with elementary school-aged children with language disorder was not available from the membership database. Of the 525 participants who worked with elementary school-aged children, 407 (77.5%) identified themselves as regularly providing clinical services to this population, as defined by having provided a service to 40 or more elementary school-aged children with language disorder in the last 12 months. These 407 participants were the sample of interest in this survey.

Participant Demographics

The participant sample included SLPs with differences in terms of employment status, service agency and remoteness of workplace. There was a varied spread amongst participants with regards to years since graduation and qualifications. Participant characteristics are outlined in Table 1.

>Insert Table 1 near here<

Objective 1: Regularity of Assessment Use

The percentage of SLPs who reported regularly using each type of assessment is displayed in Figure 1.

>Insert Figure 1 near here<

Results of univariate variable pre-selection are displayed in Table 2. Variables found to be significant in univariate pre-selection were selected for inclusion in the subsequent multivariate regression analysis. Results of multivariate regression analysis are displayed in Table 3.

>Insert Tables 2 and 3 near here<

Data Type (norm-referenced or criterion-referenced/descriptive). The majority of SLPs (83.8% or 341/407) reported regularly using norm-referenced language measures. In comparison, 47.2% of SLPs (192/407) indicated that they regularly use assessments that yield criterion-referenced/descriptive data (regular use being defined if the assessment was used with half or more of last 40 children). Only five SLPs (1.2%) indicated that they had not used norm-referenced language measures for any of the last 40 children they assessed; all these SLPs were from disability agencies. Eight SLPs (2.0%) indicated not having used criterion-referenced/descriptive assessments for any of the last 40 children they assessed, with these SLPs representing a variety of agencies.

Task Type (de-contextualized, contextualized and activity-focused). Two thirds (66.1% or 269/407) of SLPs reported regular use of de-contextualized assessments, one third (32.7% or 133/407) indicated regular use of contextualized assessments and only one quarter (25.3% or 103/407) indicated regularly using activity-focused assessments (regular use being defined as being used with half or more of last 40 children). Four participants (1.0%) reported not having used any de-contextualized assessments, 28 (6.9%) reported not having used any contextualized assessments and 62 (15.2%) reported not having used any activity-focused assessments (considering the last 40 children they assessed).

Environmental context (clinical, school or home/community contexts). Most SLPs (79.9% or 325/407) indicated regularly conducting assessment in a clinical context; 30.0% (122/407 SLPs) indicated regularly conducting assessment in a school context and only 13.0% (53/407 SLPs) indicated regularly conducting assessment in a home/community context (regular use being defined as being used with half or more of last 40 children). The number of SLPs who reported not conducting any assessment in a clinical context was 20 (4.9%), school context was 76 (18.7%) and home/community context was 174 (42.8%).

Dynamic (Test-teach-retest or gradual prompting). Only 11.1% (45/407) of SLPs reported regularly using dynamic-test-teach-retest assessments and only 17.7% (72/407) reported regularly using dynamic-gradual prompting assessments (regular use being defined as being used with half or more of last 40 children). A total of 169 (41.5%) SLPs reported not using any dynamic-test-teach-retest assessments and 106 (26.0%) SLPs indicated not having used any dynamic-gradual prompting assessments.

Objective 2: Factors that Influence Regularity of Assessment Use

Data Type (norm-referenced or criterion-referenced/descriptive). Findings from multivariate regression analysis indicated that the frequency with which SLPs use norm-referenced measures was influenced by service agency, with this factor accounting for 12.1% of the variance. Fewer SLPs in general agencies (50.0% or 10/20 SLPs) and disability agencies (65.2% or 30/46 SLPs) reported regularly using norm-referenced measures compared to 88.1% or more of SLPs in other agencies. When these findings are reported in terms of odds ratios, SLPs in private practice had 7.41 times greater odds than SLPs in general agencies of reporting regular use of norm-referenced measures and 3.96 times greater odds than SLPs in disability agencies of reporting regular use of norm-referenced measures. No factors were identified as significantly influencing the regularity with which criterion-referenced/descriptive assessments were used by SLPs.

Task Type (de-contextualized, contextualized and activity-focused). Results of multivariate regression analysis indicated that the regularity with which de-contextualized assessments were used was influenced by service agency, with this factor explaining 9.5% of the variance. SLPs in general agencies (30.0% of SLPs) and disability agencies (45.7% of SLPs) were less likely to report regular use of these assessments, whilst SLPs in education (75.2% of SLPs) and private practice (72.9% of SLPs) were more likely. SLPs in private practice had 6.29 times greater odds than SLPs in general of reporting regular use of de-contextualized assessments and 3.19 times greater odds than SLPs in disability agencies of reporting regular use of de-contextualized assessments.

Use of contextualized assessments was influenced by state and years since graduation, with these two variables explaining 15.2% of the variance. The percentage of SLPs in Western Australia who reported regular use of contextualized assessments was 61.2% compared to 42.2% in Queensland and 26.2% or less in other states. In terms of odds ratios, SLPs in Western Australia had 4.21 times greater odds than SLPs in New South Wales of reporting regular use of contextualized assessments and SLPs in Queensland had 2.24 times greater odds than SLPs in New South Wales of reporting regular use of contextualized assessments.

Use of contextualized assessments also increased with increasing number of years since graduation. The percentage of SLPs with more than 20 years since graduation who reported regular use of contextualized assessment was 46.1% compared with 35.2% of SLPs with 6-10 years of experience and 16.7% of SLPs with two years or less experience. The odds ratios indicate that SLPs with more than 21 years since graduation had 4.55 times greater odds than SLPs with less than two years since graduation of reporting regular use of contextualized assessments. SLPs with 6-10 years since graduation had 2.24 times greater

odds than SLPs with two years or less since graduation of reporting regular use of contextualized assessments.

With regards to activity-focused assessments, service agency explained 25.1% of the variance in regularity of use. The percentage of SLPs in disability agencies reporting regular use of activity-focused assessments was 63.0% compared to 33.3-35.0% of SLPs in universities, education agencies and general agencies. Only 10.2% of SLPs in private practice and 4.9% of SLPs in health agencies reported regular use of activity-focused assessments. SLPs in disability agencies had 15.07 times greater odds than of SLPs in private practice of reporting frequent use of activity-focused assessments, while SLPs in universities, education agencies and general agencies had approximately four times greater odds than SLPs in private practice of reporting frequent use of activity-focused assessments.

Environmental context (clinical, school or home/community contexts). Findings from multivariate regression analysis indicated that the regularity with which assessments were conducted in a clinical context was influenced by service agency, with this factor accounting for 14.3% of the variance. Half of SLPs in general agencies (50.0%) and disability agencies (54.3%) reported regularly conducting assessment in a clinical context compared with 77.8% or more of SLPs in other agencies. SLPs in private practice had 5.95 times greater odds than SLPs in general agencies of reporting regular use of clinical context assessments and 5.00 times greater odds than SLPs in disability agencies of reporting regular use of clinical context assessments.

The regularity with which assessments were conducted in a school context was also influenced by service agency, with this factor explaining 24.8% of the variance. The percentage of SLPs in education and disability agencies who reported regularly conducting assessments in a school context was 53.7% and 43.5%, respectively, compared with 5.0% or less of SLPs in health or general agencies. The odds of SLPs in education agencies reporting

regularly conducting assessment in a school context was 4.79 times greater than the odds of SLPs in private practice. The odds of SLPs in disability agencies reporting regularly conducting assessment in a school context was 3.18 times greater than the odds of SLPs in private practice. SLPs in private practice had 4.67 times greater odds than SLPs in health agencies of reporting regular use of school context assessments. No factors were identified as significantly influencing the regularity with which home/community context assessments were used.

Dynamic (Test-teach-retest or gradual prompting). Results of multivariate regression analysis indicate that use of dynamic test-teach-retest procedures were found to be influenced by state, with this variable explaining 13.2% of the variance. SLPs in Western Australia were more likely to regularly use this assessment (28.6% of SLPs) compared to 14.6% in New South Wales, 10.3% in Queensland and 2.8% or less in Victoria and South Australia. The odds of SLPs in Western Australia reporting regular use of dynamic test-teach-retest assessment was 2.35 times greater than the odds of SLPs in New South Wales. The odds of SLPs in New South Wales reporting regular use of dynamic test-teach-retest assessment was 11.90 times greater than the odds of SLPs in Victoria.

Use of dynamic gradual-prompting assessments were influenced by both state and years since graduation, with these two variables accounting for 12.3% of the variance. SLPs in Western Australia were more likely to report regular use of these assessments (38.8% of SLPs) compared with 16.5% or less in other states. The odds of SLPs in Western Australia reporting regular use of dynamic gradual prompting assessment was 3.28 times greater than the odds of SLPs in New South Wales. SLPs with more than two years since graduation were also more likely to report regular use of dynamic gradual prompting assessments compared to SLPs with two years or less since graduation. The percentage of SLPs with more than two years since graduation who reported regular use of this procedure was 11.3% or more

compared with 5.6% of SLPs with two years or less since graduation. The group with the highest percentage of SLPs reporting regular use of dynamic gradual prompting assessments were SLPs with 3-5 years since graduation (27.2% of SLPs). The odds of these SLPs reporting regular use of dynamic gradual prompting assessments was 6.71 times greater than the odds of SLPs with two years or less since graduation.

Objective 3. Sources of Information Reported by SLPs

The majority of SLPs (80.6% or 328/407) indicated informal discussion with colleagues as the most frequent source of information on assessment practices. This was followed by formal presentations (i.e., conferences/workshops) which was selected by 64.1% (261/407) SLPs. Less than half of the SLPs surveyed identified information provided by employer or professional supervisor (44.7% 0r 182/407)), journal articles or research reports (30.0% or 122/407), social media sites (27.3% or 111/407) or online or written material from publishers (24.3% or 99/407) as frequent sources of information. The percentage of SLPs who identified each source as a frequent source of information is displayed Figure 2.

>Insert Figure 2 near here<

Group comparisons indicated significant differences between agencies with regards to the frequency with which 'information provided by employer or professional supervisor' and 'social media sites' were selected as main sources of information. 'Information provided by employer or professional supervisor' was significantly more likely to be reported by SLPs in education (57.0%), general agencies (54.5%) and health agencies (45.3%), compared with SLPs in private practice (33.3%) and universities (22.2%) X^2 (5, N=407) = 18.27, p =0.003. 'Social media sites' were more likely to be reported by SLPs in private practice (45.7%), compared with SLPs in health agencies (18.8%) and education agencies (12.6%) X^2 (5, N=407) = 39.97, p <0.001.

Objective 4. Challenges reported by SLPs

The challenges reported by the highest number of SLPs included limited assessment materials (e.g., due to budget constraints; 35.4% or 144/407 SLPs); limited time to plan or analyze assessment (35.1% or 143/407 SLPs); limited time to meet with teachers (33.4% or 136/407 SLPs); limited time to meet with parents (26.5% or 108/407 SLPs); lack of SLP skills or confidence with assessing children from CALD backgrounds (23.6% or 96/407 SLPs) and limited face-to-face time with children for assessment (22.1% or 90/407 SLPs). The percentage of SLPs who identified each challenge as a main challenge is displayed in Figure 3.

>Insert Figure 3 near here<

Comparisons between groups indicated significant differences between SLPs from different agencies with regards to challenges reported. Limited time for planning and analyzing assessment was more likely to be reported by SLPs in universities (55.6%) and disability agencies (43.8%), compared with SLPs in private practices (21.7%) and health agencies (18.2%) X^2 (5, *N*=407) = 11.72, *p* =0.039. Limited time to meet with teachers was more likely to be reported by SLPs in education agencies (43.8%), compared with SLPs in general (21.7%) and disability agencies (14.6%) X^2 (5, *N*=407) = 16.60, *p* =0.005. Limited time to meet with parents was more likely to be reported by SLPs in universities (55.6%) and education agencies (45.2%), compared with SLPs in health agencies (12.5%) and private practice (14.7%) X^2 (5, *N*=407) = 44.78, *p* <0.001. Setting constraints (i.e., not able to see children in particular locations) was more likely to be reported by SLPs in health agencies (31.2%) and universities (22.2%), compared with SLPs in general agencies (13.6%), disability agencies (12.5%) or education agencies (8.9%) X^2 (5, *N*=407) = 17.35, *p* =0.004. Workplace requirements (i.e., workplace requires particular data or use of particular tools) were more likely to be reported by SLPs in disability (22.9%) and education agencies

(21.5%), compared with SLPs in universities (0.0%) and general agencies (0.0%) X^2 (5, N=407) = 31.10, p <0.001. Limited assessment materials (e.g., due to budget constraints) were more likely to be reported as a main challenge by SLPs in general agencies (54.5%) and disability agencies (50.0%), compared with SLPs in universities (22.2%) and education agencies (21.4%) X^2 (5, N=407) = 29.63, p <0.001.

SLPs who graduated more recently were more likely to report challenges related to lack of skills or confidence with assessing complex needs and lack of skills or confidence with assessing literacy (i.e., reading and writing). The percentage of SLPs with two or less years since graduation who reported lack of skills or confidence with assessing complex needs was significantly higher (35.0%) than of SLPs with 6-10 years since graduation (17.1%) and of SLPs with 21 or more years since graduation (8.2%) X^2 (4, N=407) = 19.20, p =0.001. The percentage of SLPs with two or less years since graduation who reported lack of skills or confidence with assessing literacy was significantly higher (26.7%) than SLPs with 6-10 years since graduation (14.5%) and SLPs with 21 or more years since graduation (7.5%) X^2 (4, N=407) = 17.53, p =0.002. No significant differences were found in relation to years since graduation and reporting of lack of confidence with assessment for children from CALD backgrounds.

Discussion

This study investigated the frequency with which SLPs from various service agencies and geographical locations use different types of assessments when assessing the language abilities of school-aged children. It is the first survey to explicitly examine SLPs use of assessments with different data types, task types, environmental contexts or dynamic features with a broad population of children and as such, provides important information with regards to the extent to which SLPs are implementing evidence-based language assessment practices. This study also examined the factors that influence the types of assessments SLPs use, the

sources from which SLPs gain information on child language assessment practice and the challenges SLPs report in relation to language assessment. This information provides greater understanding of the contextual factors that influence clinical assessment practice and assists with identifying actions that may facilitate successful implementation of evidence-based practice recommendations into the future.

Objective 1. Regularity of Assessment Use

Findings from this survey indicate that most SLPs regularly use assessments that are norm-referenced, de-contextualized and conducted in clinical context and less regularly use assessments that that are contextualized, activity-focused, dynamic or conducted in school or home/community contexts. Given that norm-referenced measures are typically de-contextualized and conducted in a clinical context, reports of regular use of these three types of assessments are consistent across this survey. These findings are also consistent with findings from previous surveys from the United States of America which have identified predominant use of norm-referenced language measures by SLPs working in schools (Beck, 1995; Caesar & Kohler, 2009; Fulcher-Rood et al., 2018).

These survey findings have important implications for clinical practice. Underuse of contextualized and activity-focused language assessments creates risk that language difficulties at a discourse level will be under-identified (Ebert & Scott, 2014; Harlaar et al., 2016; Thomas-Stonell et al., 2013) whilst underuse of dynamic assessments and assessments that target school and home/community contexts may lead to intervention goals and classroom supports that are not well-matched to a child's needs (Bishop & McDonald, 2009; Kover et al., 2014). Similarly, the use of norm-referenced measures rather than use of dynamic assessments with children from CALD backgrounds may lead to inappropriate conclusions being drawn regarding the language abilities of these children (Caesar & Kohler, 2007). The focus on the use of assessments that are norm-referenced, de-contextualized and

conducted in clinical context over other types of assessments also suggests that SLPs are not routinely assessing language performance with consideration to all components of the ICF (Westby, 2007). For these reasons, actions that increase the regularity with which SLPs use assessments that are contextualized, activity-focused, dynamic, and targeted at daily environments are necessary to advance clinical practice in the field of child language assessment.

Objective 2. Factors that Influence the Regularity with which Types of Assessments are used

A finding in this study that SLPs in disability agencies were more likely to report regular use of activity-focused assessments and SLPs in both disability and education agencies were more likely to report regular use of assessments targeting a school context. This finding may reflect that SLPs in different agencies take a different focus when collecting assessment data. A difference with education and disability agencies relative to private practice and health agencies may be workplace requirements for school performance or activity and participation restrictions to be explicitly targeted in assessment. This may necessitate the use of assessments that are activity-focused and directed specifically towards a school context. This appears consistent with results from this study indicating that SLPs in disability and education agencies were also more likely to identify workplace requirements (i.e., workplace requires particular data or use of particular tools) as a main challenge. Therefore, it is possible that SLPs predominantly choose to use de-contextualized, norm-referenced measures unless their workplace policy specifically requires them to collect data on functional performance in daily activities.

SLPs with more years since graduation were more likely to report frequent use of contextualized and dynamic-gradual prompting assessments. Unlike de-contextualized assessments, few contextualized or dynamic assessments with standardized guidelines for

administration and scoring exist. Therefore, this finding may reflect that SLPs with more years of experience have more confidence and skill conducting non-standardized assessment and using their clinical experience to interpret the data gathered from these assessments (Wilson et al., 1991). Use of contextualized and both types of dynamic assessments were also influenced by Australian State, with SLPs in Western Australia having greater odds than SLPs in other States of reporting frequent use of these assessments. Previous literature has identified that the popularity of specific language measures may vary regionally (Westerveld & Claessen, 2014) and it is possible that a similar tendency occurs with regards to the types of assessments SLPs use. Differences between states could be attributable to policy influences that span across states, rather than agencies. For example, in Western Australia, a state-wide process exists for accessing specialized schooling, thus creating a situation where SLPs from different agencies in Western Australia are required to use the same types of assessments when completing school applications (North East Metropolitan Language Development Centre & Outreach Service). It is also possible that differences between university training programs contribute to variations across states.

Another finding from this study was that SLPs with a higher proportion of children from CALD on their caseloads did not report less regular use of norm-referenced measures, despite these assessments being less suitable for this population of children (Caesar & Kohler, 2007). Similarly, although dynamic assessments can be suitable alternatives for children from CALD backgrounds (Teoh et al., 2017) these same SLPs were not more likely to regularly use dynamic assessments. The inappropriate use of norm-referenced measures with children from CALD backgrounds has been reported in previous surveys (Arias & Friberg, 2015; Caesar & Kohler, 2009; Teoh et al., 2017) and represents an area of child language assessment practice that requires significant change. Factors that influence the regularity with which criterion-referenced/descriptive and home/community context

assessments were used were not identified in this study. This indicates that, unlike other types of assessments, regular use of these types of assessments is influenced less by contextual factors such as service agency, geographical location and SLP experience.

Objective 3. Sources of Information Reported by SLPs

In this survey, the most frequently reported source of information was informal discussion with colleagues. This is consistent with findings from previous studies indicating that SLPs tend to obtain information on clinical practice from colleagues, workplaces or workshops rather than research articles (Vallino-Napoli, 2004; Wilson et al., 1991). It is possible that this tendency contributes to variations across states or agencies as clusters of SLPs may develop similar practices by sharing information amongst each other and it is also speculated that this may be a reason for differences in assessment practice between states in this study.

The finding that SLPs in education and health agencies are more likely to report 'information from employer or professional supervisor' as a source of information is likely attributable to these services being most typically provided through large government organizations that have a greater structure for professional supervision compared with smaller agencies and private practices. Nonetheless, it raises the possibility that on-the-job training may contribute to variations in practice across agencies. For example, previous studies suggested that SLPs may not graduate well-equipped to work within contemporary educational service delivery models and that information provided in workplaces may be a primary source of information on service provision for SLPs working in educational settings (Sanger et al., 2012). Additionally, previous literature has identified that having access to experts in workplaces appears to have a positive influence on SLP practice (Koole et al., 2015). Therefore, it is possible that more frequent use of assessments that target a school context by SLPs in education agencies is influenced by the professional development

opportunities provided in workplaces, such as training in conducting curriculum-based assessment.

Objective 4. Challenges Reported by SLPs

In this survey, challenges related to lack of time were frequently reported by SLPs as main challenges when assessing the language abilities of elementary school children. Limited time has also been reported by SLPs in previous surveys as a barrier for use of both contextualized and dynamic assessment procedures (Arias & Friberg, 2015; Fulcher-Rood et al., 2018; Huang et al., 1997; Pavelko et al., 2016; Westerveld & Claessen, 2014). The highly standardized nature of norm-referenced measures may make these assessments quicker to administer and score, which may lead to these measures being favored by time-poor SLPs (Fulcher-Rood et al., 2018). In contrast, activity-focused and dynamic assessments likely require more time to plan, administer and interpret results. Lack of assessment materials (e.g., due to budget constraints) was also reported as a main challenge by SLPs. The finding that this challenge was less frequently reported by SLPs in education agencies and universities may be reflective of greater financial capacity to purchase resources in such larger organizations. Interestingly, the types of assessments that SLPs reported as using less regularly, such as activity-focused and dynamic assessments, do not typically require high material resourcing or financial outlay. For this reason, it seems unlikely that lack of assessment materials influences SLP's use of activity-focused and dynamic assessments, although further research is needed to examine this.

Lack of skills or confidence with assessing complex communication needs or literacy was more likely to be identified by SLPs with fewer years since graduation. This finding is not surprising since it likely takes time to develop confidence and skill in these more complex areas of professional practice. In contrast, assessment for children from CALD backgrounds was the most frequently identified challenge related to lack of skills and confidence and was

not identified as being related to years since graduation. This finding reflects a priority for professional development across all levels of the profession, particularly given the identified over-reliance on norm-referenced measures for this population of children (Arias & Friberg, 2015; Teoh et al., 2017).

The physical location in which services are provided may also contribute to variations in use of different types of assessments. In this survey, SLPs working in education agencies were less likely to report workplace setting as a constraint when conducting assessment. This may be due to SLPs in education agencies being more likely to be located on school grounds and thus more easily able to meet with teachers or visit classrooms to observe children in daily school environments (Koole et al., 2015). Interestingly, SLPs in education agencies were more likely to report lack of time to meet with teachers as a challenge, despite being the group most likely to be able access teachers easily. It is possible that physical location is initially perceived by SLPs as the greatest challenge, and when this challenge is removed other challenges emerge, such as being able to schedule time to collect information from teachers. Unlike clinical and school context assessments, use of home/community context assessments was not influenced by service agency, suggesting that the challenges related to regular use of home/community context assessments may be shared across agencies.

Future Directions

Findings from this study suggest several future directions that may facilitate implementation of evidence-based practice recommendations by SLPs when assessing the language abilities of elementary school-aged children. This includes the creation of activity-focused and dynamic assessments that have set guidelines for administration and analysis. By their very nature, assessments that are activity-focused, dynamic, or conducted in school or home/community contexts may always require some individualization for a child's particular activities or contexts. Nonetheless, the development of more specific guidelines for

administering and interpreting these types of assessments may assist in addressing some of the time barriers SLPs experience when conducting language assessments. In particular, developing SLP's skills in conducting dynamic assessments may help facilitate evidence-based diagnostic assessment practices for children from CALD backgrounds (Teoh et al., 2017). There is also a need to develop questionnaires and interview protocols that facilitate collection of data on a child's abilities in school or home/community contexts.

As SLPs report challenges related to limited time, focus needs to be placed on optimizing the balance between the time needed to conduct quality assessment and costs of professional time, with this reflected in workload and funding policies. This may also include creating opportunities for SLPs and teachers to collaborate to facilitate assessment that targets a school context. Nonetheless, it is also important to build SLP capacity to conduct assessment in time efficient manner, for example, additional training in administering and analyzing different types of assessments may lead to SLPs being more time efficient when conducting assessment.

To build SLP capacity, university programs should be examined to ensure that entry-level SLPs are sufficiently prepared to conduct different types of assessments (Pavelko et al., 2016). It is also important that SLPs have access to continuing professional development post-graduation through workshops and consultation with SLPs who have expert knowledge in child language assessment. Given that informal discussions with colleagues is the most frequently reported source of information, it is vital to ensure that this tendency is harnessed to promote sharing of evidence-based information. Actions that increase the accessibility and utilization of journal articles by SLPs may also be needed to support implementation of evidence-based practice recommendations (Reilly, 2004).

As it was not possible to examine every possible factor in one survey, further research may be needed to explore the influence of other factors that were not examined in this study.

Further research is also needed to examine the types of assessments used by SLPs in different countries. Although SLP practice across English-speaking countries is likely to be similar, additional factors may result in differences between countries (Singh et al., 2016). Future research would ideally use the same assessment definitions and response scales to allow findings from different countries to be compared with consistency and transparency.

Finally, since this study identified variations with regards to the frequency with which different groups of SLPs use different types of assessments, future investigations are needed to examine the implications of these differences for children and their families. Given that intervention is planned based on assessment findings, it likely that differences in assessment use across agencies or states are associated with differences in interventions provided; however further research is needed to examine this (Roulstone, 2001).

Strengths and Limitations

The survey used in this study utilized terminology for describing different types of assessments from a newly developed taxonomy that was agreed-upon through a previous Delphi technique involving Australian SLPs with expertise in child language. This is an important methodological advance to previous survey research in the field of child language as it ensured greater consistency across survey participants with regards to how types of assessments were described.

A limitation of this study is that, although the study included a large sample of SLPs from all over Australia; some groups, such as SLPs in smaller states or agencies, had small sample sizes. This limits the extent that survey findings can be generalized for these groups of SLPs. It also meant that data from smaller states was not able to be included in the regression analysis. As some of these groups have small overall populations (for example, the 11 SLPs from Northern Territory in the current study represent 40.1% of the estimated population for the Northern Territory), qualitative methodologies, such as semi-structured

interviews, may be more appropriate for understanding the types of assessments used in these more unique contexts and factors that influence assessment use.

This study specifically examined the types of assessments SLPs use when assessing the language abilities of elementary school-aged children. SLPs may not use the same types of assessments with the same regularity when assessing children of other ages (Caesar & Kohler, 2009; Pavelko et al., 2016). This study also did not examine the decision-making processes SLPs employ when analyzing data collected from different types of assessments. Therefore, further investigation is needed to examine these areas of SLP assessment practice.

Conclusion

SLPs predominantly use norm-referenced and de-contextualized measures conducted in clinical context when assessing the language abilities of elementary school-aged children and less regularly use contextualized, activity-focused or dynamic assessments and assessments conducted in everyday environmental contexts. Factors that influence the use of different types of assessments were identified as service agency, Australian State, and years since SLP graduation. The most frequently reported source of information on assessments was informal discussions with colleagues. SLPs identified challenges related to limited time, lack of assessment materials, limited access to training in assessment and lack of skill or confidence with assessing children from CALD backgrounds. Given current recommendations for practice, future development in the field of child language assessment should focus on actions that increase the regularity with which contextualized, activity-focused and dynamic assessments are used and the regularity with which SLPs assess abilities in school or home/community contexts. As this survey identified that variations exist between service agencies and states with regards to the regularity with which different assessments are used, it is important that future actions to advance clinical practice are developed by taking into consideration the unique contexts of different service agencies and

states. Consideration should also be given to the challenges that SLPs report in relation to language assessment for elementary school-aged children.

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Supplementary Materials

Supplementary Material 1 contains a list of the terms and definitions used to describe language assessments i.e., data type, task type, environmental context, and dynamic features. Supplementary Material 2 contains a copy of the survey questions included in the study. Supplementary Material 3 contains data on the number of SLPs surveyed in relation to the estimated population of SLPs in each Australian state/territory.

Table 1.

Characteristics of Survey Participants who work with Children Aged 4-12 Years with Language Disorder

Category	Subcategory	Australian State or Territory of Workplace									
		Australian Capital Territory (ACT) (n=11)	New South Wales (n=103)	Northern Territory (n=7)	Queensland (n=116)	South Australia (n=36)	Tasmania (n=14)	Victoria (n=71)	Western Australia (n=49)	Total (n=407)	*Total (n=375)
Gender	Female	10 (90.95%)	101 (99.5%)	7 (100%)	111 (95.7%)	35 (97.2%)	14 (100%)	69 (97.2%)	46 (93.9%)	393 (96.6%)	362 (96.5%)
	Male	1 (9.1%)	2 (3.3%)	0 (0.0%)	4 (3.4%)	1 (2.8%)	0 (0.0%)	2 (2.8%)	3 (6.1%)	13 (3.2%)	12 (3.2%)
	Other	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.2%)	1 (0.3%)
Employment Status	Work full-time (1 FTE)	9 (81.8%)	69 (67.0%)	6 (85.7%)	73 (62.9%)	23 (63.9%)	8 (57.1%)	44 (62.0%)	25 (51.0%)	257 (63.1%)	234 (62.4%)
	Work part-time (< 1 FTE)	2 (18.2%)	34 (33.0%)	1 (14.2%)	43 (37.1%)	13 (36.1%)	6 (42.8%)	27 (38.0%)	24 (48.9%)	150 (36.8%)	141 (37.6%)
Agency through which SLP service is provided	[a]Education service	1 (9.1%)	5 (4.9%)	1 (14.3%)	64 (55.2%)	22 (61.1%)	12 (85.7%)	23 (32.4%)	7 (14.2%)	135 (33.2%)	121 (32.3%)
	[b]Private practice	7 (63.6%)	39 (37.9%)	1 (14.3%)	5 (4.3%)	6 (16.7%)	2 (14.2%)	21 (29.6%)	27 (55.1%)	129 (31.1%)	118 (31.5%)
	[c]Health service	1 (9.1%)	35 (34.0%)	2 (28.6%)	5 (4.3%)	1 (27.7%)	0 (0.0%)	13 (18.3%)	7 (14.2%)	64 (15.7%)	61 (16.3%)
	[d]Disability specific	2 (18.2%)	14 (13.6%)	0 (0.0%)	11 (9.2%)	5 (13.9%)	0 (0.0%)	11 (15.5%)	5 (10.2%)	48 (14.0%)	46 (12.3%)
	[e]General agency	0 (0.0%)	5 (4.9%)	2 (18.2%)	9 (7.8%)	1 (27.7%)	0 (0.0%)	2 (2.8%)	3 (7.5%)	22 (5.4%)	20 (5.3%)
	[f]University clinic	0 (0.0%)	5 (4.9%)	0 (0.0%)	2 (1.7%)	1 (2.7%)	0 (0.0%)	1 (1.4%)	0 (0.0%)	9 (2.2%)	9 (2.4%)

Category	Subcategory	Australian State or Territory of Workplace									
		Australian Capital Territory (ACT) (n=11)	New South Wales (n=103)	Northern Territory (n=7)	Queensland (n=116)	South Australia (n=36)	Tasmania (n=14)	Victoria (n=71)	Western Australia (n=49)	Total (n=407)	*Total (n=375)
Years since graduation	0-2 years	5 (45.5%)	16 (15.5%)	0 (0.0%)	21 (18.1%)	4 (11.1%)	1 (7.1%)	8 (11.3%)	5 (10.2%)	60 (14.7%)	54 (14.4%)
	3-5 years	5 (45.5%)	25 (24.2%)	1 (14.2%)	35 (30.2%)	11 (30.5%)	6 (42.9%)	12 (16.9%)	9 (18.4%)	104 (25.6%)	92 (24.5%)
	6-10 years	1 (9.1%)	22 (21.4%)	1 (14.2%)	16 (13.8%)	7 (19.4%)	3 (21.4%)	17 (23.9%)	9 (18.4%)	76 (18.7%)	71 (18.9%)
	11-20 years	0 (0.0%)	21 (20.4%)	2 (28.6%)	23 (19.8%)	4 (11.1%)	3 (21.4%)	22 (31.0%)	12 (24.4%)	87 (21.4%)	82 (21.9%)
	21+ years	0 (0.0%)	19 (18.4%)	3 (42.9%)	21 (18.1%)	10 (27.8%)	1 (7.1%)	12 (16.9%)	14 (28.6%)	80 (19.7%)	76 (20.3%)
Qualifications	Other qualification/s besides Bachelor's degree	6 (54.5%)	38 (39.1%)	4 (57.1%)	38 (32.8%)	10 (27.8%)	7 (50.0%)	26 (36.6%)	16 (32.7%)	145 (35.6%)	128 (34.1%)
	Bachelor's degree with honours	1 (9.1%)	6 (6.2%)	0 (0.0%)	14 (12.1%)	2 (55.5%)	1 (7.1%)	5 (7.0%)	6 (12.2%)	35 (8.6%)	33 (8.8%)
	Bachelor's degree	4 (36.3%)	59 (60.8%)	3 (42.8%)	64 (55.2%)	24 (66.7%)	6 (42.8%)	40 (56%)	27 (55.1%)	227 (55.8%)	214 (57.1%)
[g]Remoteness (ASGS classification)	Major City	11 (100%)	72 (69.9%)	0 (0.0%)	73 (62.9%)	26 (72.2%)	0 (0.0%)	54 (67.1%)	47 (95.9%)	283 (69.5%)	272 (75.1%)
	Regional-Remote	0 (0.0%)	31 (30.1%)	7 (100%)	43 (37.1%)	10 (27.8%)	14 (100%)	17 (23.9%)	2 (4.1%)	124 (30.5%)	103 (27.5%)

Category	Subcategory	Australian State or Territory of Workplace									
		Australian Capital Territory (ACT) (n=11)	New South Wales (n=103)	Northern Territory (n=7)	Queensland (n=116)	South Australia (n=36)	Tasmania (n=14)	Victoria (n=71)	Western Australia (n=49)	Total (n=407)	*Total (n=375)
Proportion of children with Culturally And Linguistically Diverse Backgrounds (CALD)	Less than half of last 40 children were from CALD backgrounds	11 (100%)	76 (73.8%)	5 (71.4%)	106 (91.4%)	32 (88.8%)	14 (100%)	55 (77.5%)	47 (95.1%)	346 (85.0%)	316 (84.3%)
	More than half of last 40 children were from CALD backgrounds	0 (0.0%)	27 (26.2%)	2 (28.6%)	10 (8.6%)	4 (11.1%)	0 (0.0%)	16 (22.5%)	2 (4.1%)	(61) 15.0%	59 (15.7%)

Note: [a]Education service or school (may be government or non-government), [b]Private practice i.e. business owner or employee in private practice, [c]Health service or hospital (may be government or non-government), [d]Disability agency i.e. children must have diagnosis (or suspected diagnosis) of disability to access the service (may be government or non-government), [e]Agency that is not identified as education, health or disability specific (may be government or non-government), [f]University clinic i.e. student teaching clinic, [g]As classified by Australian Statistical Geography Standard (ASGS) developed by the Australian Bureau of Statistics (2016). Australian Bureau of Statistics. *Australian Statistical Geography Standard (ASGS)*. 2016 [cited 2018 March]; Available from: http://www.abs.gov.au/ausstats/abs@.nsf/mf/1270.0.55.005; *Total number when participants from three smallest states are removed i.e. participant number in statistical analysis for research objective

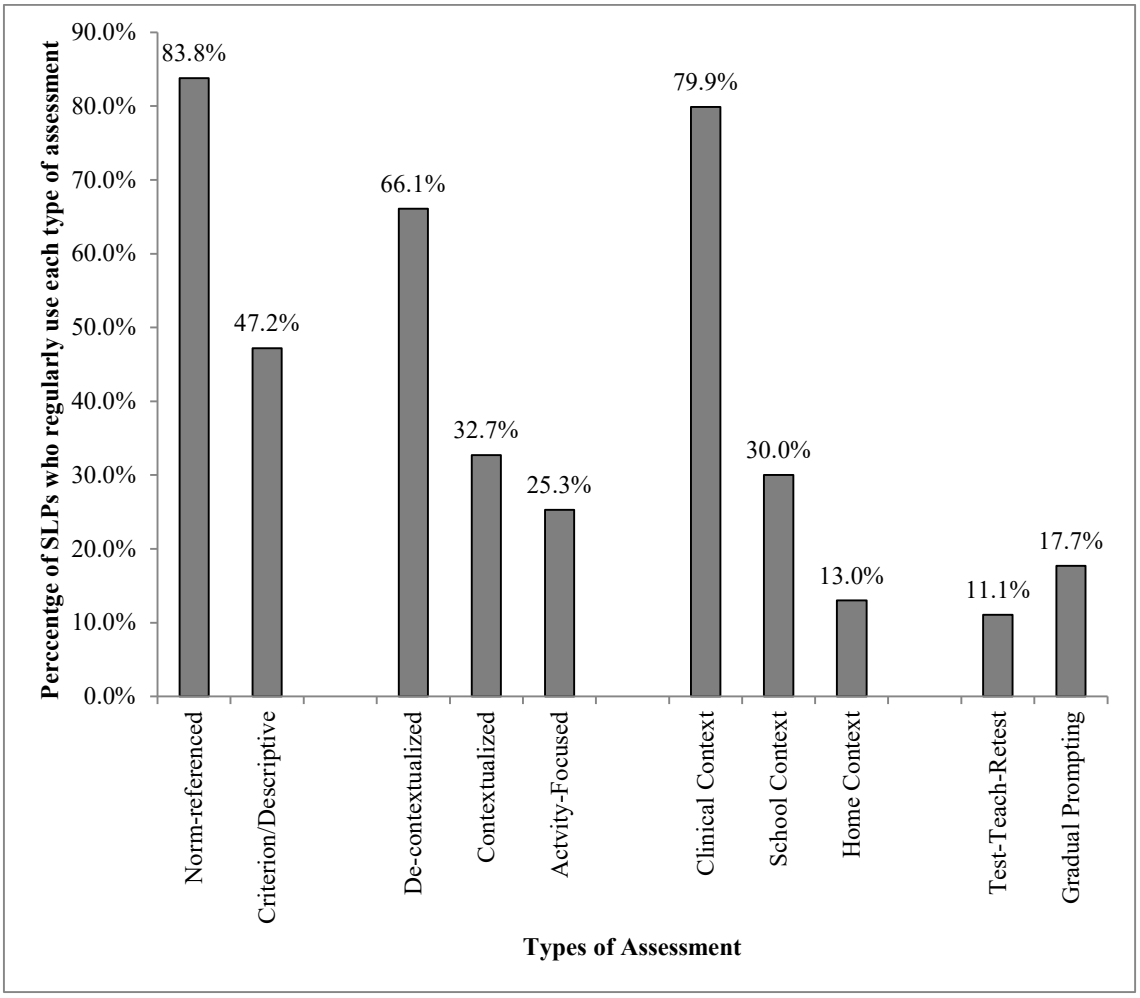

Figure 1. Percentage of SLPs (n= 407) who reported regularly using each type of assessment. Regular use was defined as being used with half or more of the last 40 children who were assessed. Assessments are described by: Data Type (each assessment is either norm-referenced or criterion-referenced/descriptive), Task Type (each assessment is either de-contextualized, contextualized or activity-focused), Environmental Context (each assessment targets either clinical, school or home/community context) and Dynamic (assessments may or may not be dynamic - test-teach-retest or dynamic - gradual prompting).

Table 2

Variables that Influence the Regularity with which Each Type of Assessment is Used (univariate analysis) (n=375)

Dependent Variable	**Independent Variable (factors that influence assessment use)**					
Assessment type	**Agency**	**State**	**Years since graduation**	**SLP Qualifications**	**[a] Remoteness (ASGS classification)**	**[b] Number of children from CALD backgrounds**
Norm-referenced (Data Type)	**<0.001****	**0.084***	0.162	0.721	0.183	0.356
Criterion referenced (Data Type)	0.454	**0.067***	0.211	0.450	0.503	0.393
De-contextualized (Task Type)	**<0.001****	0.955	0.432	0.109	0.683	0.920
Contextualized (Task Type)	**0.019****	**<0.001****	**0.007***	0.312	**0.004****	0.303
Activity focused (Task Type)	**<0.001****	**0.056***	0.496	0.624	0.711	0.503
Clinical Context (Environmental Context)	**<0.001****	0.539	0.445	0.948	0.373	0.595
School Context (Environmental Context)	**< 0.001****	**0.025***	0.689	0.918	0.917	0.780
Home Context (Environmental Context)	**0.047***	**0.018***	0.433	0.157	**0.061***	0.903
Test-Teach-Retest (Dynamic)	0.334	**<0.001****	0.228	**0.039***	0.166	0.917
Gradual prompting (Dynamic)	0.264	**0.003****	**0.008***	0.355	0.238	0.129

Note: *p<0.1 (variables with p<0.1were selected for inclusion in multivariate regression analyses) ** p<0.005. [a]As classified by the Australian Statistical Geography Standard (ASGS) from the Australian Bureau of Statistics (2016); Available from: http://www.abs.gov.au/ausstats/abs@.nsf/mf/1270.0.55.005; [b]Number of children (considering the last 40 children assessed) identified as having CALD (Cultural or Linguistic Diversity) e.g. bilingualism or standard Australian English is not child's first language.

Table 3

Multivariate Regression Models: Factors that Influence the Regularity with which Different Types of Assessments are Used (n=375)

Norm-referenced: Nagelkerke R^2= 12.1; p-value <0.001				
Independent variable (n)	**% of SLPs[a]**	**p-value**	**Odds Ratio**	**95% CI for odds ratio**
Agency		<0.001***		
Private practice (118)	88.1	reference	1 (reference)	
Disability (46)	65.2	0.001**	0.25[b]	0.11 – 0.58
Education (121)	89.3	0.784		
General (20)	50.0	<0.001***	0.14[b]	0.048 – 0.38
Health (58)	88.5	0.939		
University (9)	88.9	0.946		
De-contextualized: Nagelkerke R^2= 9.5; p-value <0.001				
Independent variable (n)	**% of SLPs[a]**	**p-value**	**Odds Ratio**	**95% CI for odds ratio**
Agency		<0.001***		
Private practice (118)	72.9	reference	1 (reference)	
Disability (46)	45.7	0.001**	0.31[b]	0.15 - 0.63
Education (121)	75.2	0.682		
General (20)	30.0	0.001**	0.16[b]	0.06 - 0.45
Health (58)	67.2	0.429		
University (9)	55.6	0.276		
Contextualized: Nagelkerke R2= 15.2; p-value <0.001				
Independent variable (n)	**% of SLPs[a]**	**p-value**	**Odds Ratio**	**95% CI for odds ratio**
State		<0.001***		
New South Wales (103)	26.2	reference	1 (reference)	
Queensland (116)	42.2	0.007**	2.24	1.24 - 4.04
South Australia (36)	25.0	0.818		
Victoria (71)	21.1	0.327		
Western Australia (49)	61.2	<0.001***	4.21	2.01-8.83
Years Since Grad		0.008**		
0-2 years (54)	16.7	reference	1 (reference)	
3-5 years (92)	30.4	0.061		
6-10 years (71)	35.2	0.010*	3.26	1.32 - 8.00
11-20 years (82)	40.2	0.003**	3.81	1.59 - 9.14
21+ years (76)	46.1	0.001**	4.55	1.89 - 10.96

Activity-Focused: Nagelkerke R2= 25.1; p-value <0.001

Independent variable (n)	% of SLPs[a]	p-value	Odds Ratio	95% CI for odds ratio
Agency		<0.001***		
Private practice (118)	4.9	reference	1 (reference)	
Disability (46)	63.0	<0.001***	15.07	6.47 - 35.20
Education (121)	33.9	0.239	4.53	2.24 - 9.17
General (20)	35.0	<0.001***	4.76	1.59 - 14.23
Health (58)	10.2	0.005**		
University (9)	33.3	0.054	4.42	0.98-19.97

Clinical Context: Nagelkerke R^2= 14.3; p-value <0.001

Independent variable (n)	% of SLPs[a]	p-value	Odds Ratio	95% CI for odds ratio
Agency		<0.001***		
Private practice (118)	85.6	reference	1 (reference)	
Disability (46)	54.3	<0.001***	0.20[b]	0.09 - 0.44
Education (121)	85.1	0.918		
General (20)	50.0	0.001***	0.17[b]	0.06 - 0.47
Health (58)	91.8	0.236		
University (9)	77.8	0.53		

School Context: Nagelkerke R^2= 24.8; p-value <0.001

Independent variable (n)	% of SLPs[a]	p-value	Odds Ratio	95% CI for odds ratio
Agency		<0.001***		
Private practice (118)	19.5	reference	1 (reference)	
Disability (46)	43.5	0.002***	3.18	1.52 - 6.66
Education (121)	53.7	<0.001**	4.79	2.69 - 8.55
General (20)	5.0	0.147		
Health (58)	4.9	0.015*	0.21[b]	0.06 - 0.74
University (9)	33.3	0.33		

Dynamic: Test-Teach-Retest: Nagelkerke R^2= 13.2; p-value <0.001				
Independent variable (n)	**% of SLPs[a]**	**p-value**	**Odds Ratio**	**95% CI for odds ratio**
State		<0.001***		
New South Wales (103)	14.6	reference	1 (reference)	
Queensland (116)	10.3	0.345		
South Australia (36)	2.8	0.09		
Victoria (71)	1.4	0.018*	0.08[b]	0.01 - 0.65
Western Australia (49)	28.6	0.043*	2.35	1.03 - 5.37
Dynamic: Gradual Prompting: Nagelkerke R^2= 12.3; p-value <0.001				
Independent variable (n)	**% of SLPs[a]**	**p-value**	**Odds Ratio**	**95% CI for odds ratio**
State		0.005**		
New South Wales (103)	16.5	reference	1 (reference)	
Queensland (116)	16.4	0.862		
South Australia (36)	13.9	0.618		
Victoria (71)	12.7	0.487		
Western Australia (49)	38.8	0.004**	3.28	1.47 - 7.30
Years Since Grad		0.012*		
0-2 years (54)	5.6	reference	1 (reference)	
3-5 years (92)	27.2	0.003**	6.71	1.89 - 23.81
6-10 years (71)	11.3	0.294		
11-20 years (82)	22.0	0.019*	4.70	1.29 - 17.17
21+ years (76)	19.7	0.046*	3.81	1.02 - 14.16

Note: Models were not significant (p<0.01) for criterion-referenced/descriptive or home/community context assessment; *p<0.05; **p<0.01; ***p<0.001; [a]Percentage of SLPs from each category who reported regularly using each assessment procedure; [b]In the text of the publication, categories with odds ratios less than 1.0 are reported as the corresponding ratio above 1.0 (inverse of the odds ratio).

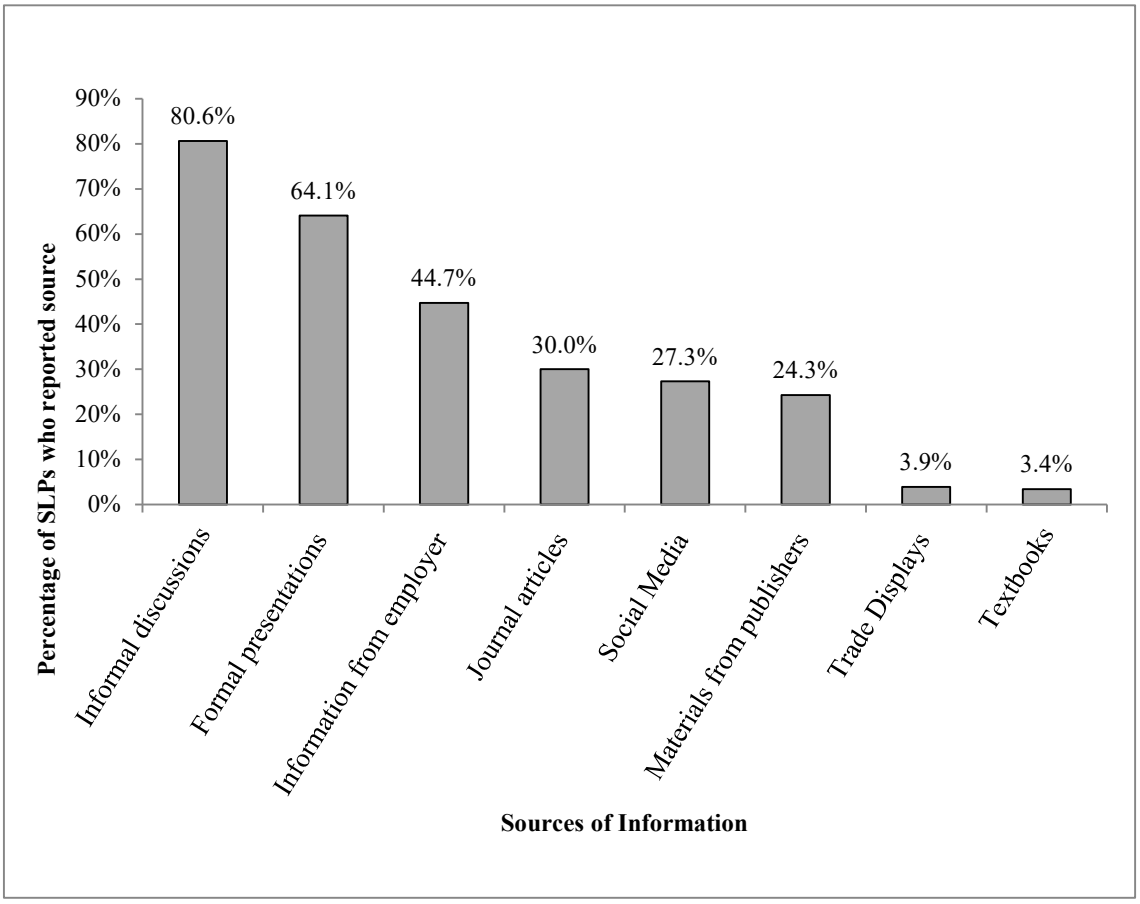

Figure 2. Percentage of SLPs (n=407) who identified each source as a main source of information on child language assessment practice. SLPs were able to select up to three main sources of information.

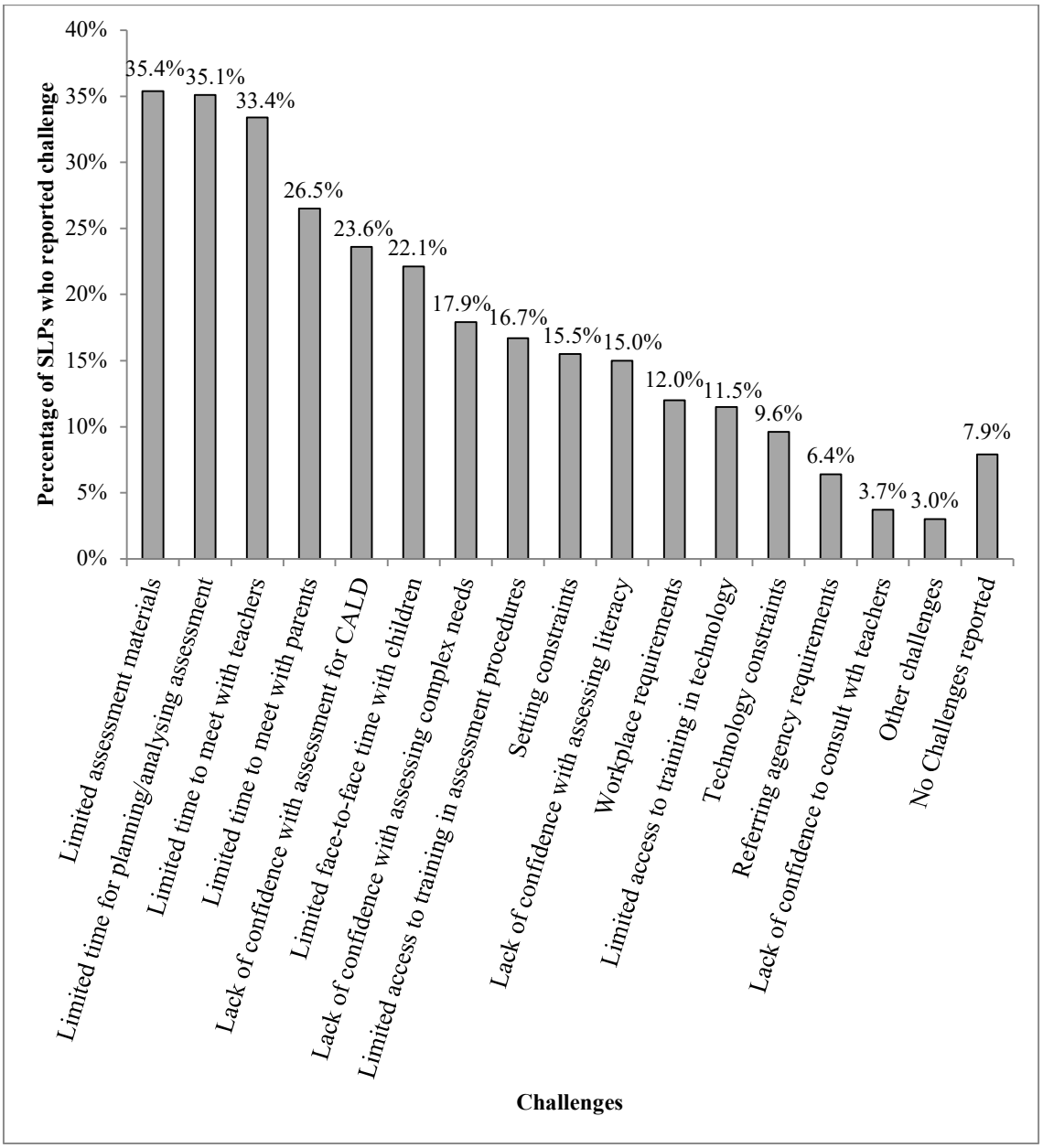

Figure 3. Percentage of SLPs (n=407) who identified each challenge as a main challenge when assessing elementary school children with language disorder. SLPs were able to select up to four main challenges.