

Assessing the speech production of multilingual children: A survey of speech-language therapists in French-speaking Belgium

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ABSTRACT

Background: Assessing the speech production of multilingual children is challenging for Speech-Language Therapists (SLTs) around the world. Scientific recommendations to improve clinical practice are available, but their implementation has mostly been described in studies from English-speaking countries. *Aims:* This survey aimed to describe the perspectives and practices of SLTs in assessing the speech production of multilingual children in French-speaking Belgium. *Methods & Procedures:* An online survey was completed by 134 SLTs in French-speaking Belgium. *Outcomes & Results:* SLTs predominantly used norm-referenced assessment approaches, which are not recommended for use with multilingual children, and that SLTs lacked necessary training and resources to implement recommended practices in the assessment of speech production of multilingual children. The shift towards more appropriate practices with multilingual children seems to be in its infancy among SLTs in French-speaking Belgium. Some challenges identified by the SLTs were common to those in other countries and languages, such as the difficulty to distinguish between speech differences and speech disorders. Other challenges were specific to the French-language and/or the Belgian context, such as the lack of appropriate tools in French. *Conclusions & Implications:* Action is required to improve clinical practice in assessing the speech production of multilingual children in French-speaking contexts: better training for SLTs regarding linguistic diversity, more implementation research in the field of SLT, and advocacy for linguistic diversity with decision makers.

Keywords: multilingual, bilingual, speech production, assessment, speech language therapist, French

What this paper adds

What is already known on this subject.

Existing research indicates that assessing the speech production of multilingual children is challenging for speech-language therapists (SLTs). Scientific recommendations for best practices have been published, and the shift to more appropriate assessment practices may be progressing differently across countries. SLTs' practices have been described in surveys, mostly conducted in English-speaking countries. Although French is the 5th most spoken language in the world, data about SLTs' perspectives and practices in French-speaking regions are scarce.

What this study adds.

The implementation of recommended practices in assessing multilingual children's speech production was limited among SLTs in French-speaking Belgium. The norm-referenced approach to assessment was predominant and few SLTs used recommended practices (e.g., criterion-referenced measures, dynamic assessment, assessment of the child's speech production in the home language). Some challenges were identified that related specifically to practices in French-speaking contexts (e.g., lack of French tools) and Belgian context (e.g., health policies unfavourable to multilingualism). These findings confirm that specific understanding of a situation is needed to develop context- and/or language-specific solutions – and ultimately improve clinical practice.

Clinical implications of this study.

SLTs in French-speaking Belgium require specific training and support to provide appropriate assessment of speech production in multilingual children. Efforts to improve practices in French-speaking contexts should focus on increasing understanding and consideration of cultural and linguistic diversity at all levels of child's environment. Evidence-based

knowledge, assessment tools and multilingual resources are available to SLTs on websites in French and in English.

Introduction

In many regions of the world, Speech and Language Therapists (SLTs) meet an increasing proportion of young multilingual children – those who use more than one language in their daily life (Grosjean, 2010). Surveys in Europe, New-Zealand and the United States showed that the majority of SLTs have more than 25% of multilingual children on their caseloads (Bloder et al., 2021; Estienne & Vander Linden, 2014; Guiberson & Atkins, 2012; Newbury et al., 2020; Oxley et al., 2019). In Australia, SLTs reported that, on average, they provide services to 59 multilingual children per year (Williams & McLeod, 2012).

For SLTs working with multilingual children, assessing these children's speech production is challenging for two main reasons. First, the languages that multilingual children speak are incredibly diverse. Depending on the region, SLTs have reported that between 24 and 87 different family languages were used by multilingual children on their caseloads (D'Souza et al., 2012; Estienne & Vander Linden, 2014; Guiberson & Atkins, 2012; Newbury et al., 2020; Oxley et al., 2019; Williams & McLeod, 2012). Despite the presence of multilingual SLTs in many countries, there is generally little overlap between the languages spoken by clients seeking speech-language pathology services and the SLTs. As an example, in the survey of Bloder and colleagues (2021) conducted in Austria, Germany, Italy and Switzerland, only 7.6% of SLTs spoke languages considered to be prevalent in migrant communities. This mismatch in language skills hinders the direct assessment of the child's speech production in all their languages, so the SLT is unable to determine if signs of disorders are present in all the languages that the child uses. Second, as multilingual speech development differs from monolinguals (Hambly et al., 2013), it can be hard for SLTs to distinguish between *real* disorders and *perceived* difficulties, that are in fact differences due

to multilingual acquisition. These challenges in assessment of speech production put multilingual children at risk for misdiagnosis (De Lamo White & Jin, 2011).

Over the last decade, recommended practices to assess the speech production of multilingual children have been published (Blumenthal et al., 2015; De Lamo White & Jin, 2011; International Expert Panel on Multilingual Children’s Speech, 2012). The shift to more appropriate assessment practices has been documented in several surveys, but these surveys were mostly conducted in English-speaking regions. The survey reported in this paper extends this previous work by considering the perspectives and practices of Belgian French-speaking SLTs in assessing the speech production of multilingual children.

Multilingual speech development

It has been well established that multilingual children generally develop speech and language skills at the same rate as their monolingual peers, but there is also strong evidence of qualitative differences and increased interindividual variations in the speech development of multilinguals compared to monolinguals (Hambly et al., 2013). Longitudinal studies have shown that even if the speech sound skills of young multilinguals differ from their monolingual peers, all children will reach adult-like skills with sufficient exposure and practice (McLeod & Goldstein, 2012). Qualitative differences in the speech development of multilingual children result from them developing distinct, but interacting, phonological systems for each language that they speak. These interactions may create transfers and cross-linguistic effects (Hambly et al., 2013).

First, multilingual children exhibit speech sound skills that are at the same time less advanced (negative transfer) and more advanced (positive transfer) compared to monolingual peers. Depending on phonetic complexity, functional load and phonetic frequency in the two languages, some speech sounds might be easier to acquire than others (McLeod & Goldstein, 2012). For example, the sounds /θ/ and /ð/ are typically acquired at 43 months by

monolingual speakers of Greek (Papadopoulou, 2000), but in English it is typically acquired around 72 months by monolingual speakers (McLeod & Crowe, 2018). Thus, a child acquiring Greek and English simultaneously may acquire these sounds at an age different to his/her monolingual peers in either language.

Second, cross-linguistic effects reveal the influence of one system on the other at segmental or suprasegmental level. For example, Kehoe and Kannathasan (2021) studied the voice onset time (VOT) of stop consonants in multilingual French-speaking children aged 3-to-6-years. Multilingual children whose home language was characterised by a long lag - short lag distinction (such as English or Norwegian) had longer VOTs in French than monolinguals. This is consistent with the influence of the home language on French (that has a lead – short lag distinction). Transfers and cross-linguistic effects vary according to each language pair. As an illustration, Duncan and Paradis (2016) showed that bilingual children who had a Chinese home language (Cantonese or Mandarin) had lower coda accuracy in English than children who had a South Asian home language (Hindi, Punjabi and Urdu).

Inter-individual variation among multilingual children is not limited to these cross-linguistic interactions. Children also show great variation in the rate at which each language develops. This is explained by several factors. For most multilingual children, the proportion of exposure to one language – and the proportion of use by the child – is higher for one language than the others (Hoff et al., 2012), resulting in higher proficiency and dominance in this language (Meziane & MacLeod, 2021). Regarding sociolinguistic context, it has been widely observed that children acquire the majority language reliably, while the acquisition of minority languages is more variable (De Houwer, 2007; Hoff, 2021). The necessity to use a minority language may be difficult to maintain over time, and this creates a risk for attrition of the home language for multilingual children (De Houwer, 2021).

Assessment of speech production in multilingual children

In some children speech development does not occur in a typical way, due to the presence of a speech sound disorder (SSD). SSD is defined as any combination of difficulties with perception, articulation/motor production, and/or phonological representation of speech segments (consonants and vowels), phonotactics (syllable and word shapes), and prosody (lexical and grammatical tones, rhythm, stress, and intonation) that may impact speech intelligibility and acceptability (International Expert Panel on Multilingual Children’s Speech, 2012). SSD can occur in both monolingual and multilingual children, and prevalence is similar in monolingual and multilingual populations (Hambly et al., 2013).

To identify SSD in monolingual or multilingual children, SLTs typically use a norm-referenced assessment approach in contexts where norms are available (e.g., The Netherlands: Diepeveen et al., 2020; Ireland: Mulgrew et al., 2022; Australia: Williams & McLeod, 2012). This approach includes the use of standardised tests and the comparison of a child’s score to their *peers* (most often norms based on monolingual children). Previous studies have reported general weak psychometric properties of standardised tests for diagnostic decision-making for multilingual children, and overreliance on standardised tests for diagnostic decision-making with both monolingual and multilingual children (Fabiano-Smith, 2019). Results from standardised testing must be interpreted with caution, especially with multilingual children for whom this is not good practice (Castilla-Earls et al., 2020; Fabiano-Smith, 2019). Among other factors, the use of inappropriate assessment approaches and tools put multilingual children at risk for both under- and over-diagnosis of SSD (De Lamo White & Jin, 2011; McLeod et al., 2017). On one hand, typical patterns that arise from cross-linguistic interactions may be misinterpreted as signs of disorders, leading to over-diagnosis. Some children are then diagnosed and must attend SLT services while they don’t have disorders. This is a waste of time, money, and resources for families and society. On the other hand, real

speech difficulties may be misattributed to multilingual acquisition, leading to under-diagnosis. Thus, some children who have speech disorders are not identified and miss the services they need.

In the past decade, an evidence-base of knowledge concerning multilingual development has been established in the scientific literature for working appropriately with multilingual children and their families, particularly when conducting assessments of speech production (Blumenthal et al., 2015; Castilla-Earls et al., 2020; De Lamo White & Jin, 2011; Fabiano-Smith, 2019; International Expert Panel on Multilingual Children’s Speech, 2012; McLeod et al., 2017). This scientific literature converges on the following recommendations: (a) increased training for SLTs including knowledge on multilingual speech development and disorders, knowledge on a range of languages, speech transcription with complete International Phonetic Alphabet (IPA); (b) extra time and resources; and (c) an assessment approach that combines data from several sources, as this compensates for the inherent weakness of each individual data source. If data from multiple sources point to SSD, then a diagnostic decision can be made based on this converging evidence.

Elements that could provide converging evidence have been provided by a number of experts in the field. It is recommended to collect a detailed case history, including linguistic experience and parental concern, assessment should include elements describing speech production in as many of the child’s languages as possible, and standardised test can be used in a descriptive way, but without comparison to monolingual norms (Blumenthal et al., 2015; Castilla-Earls et al., 2020; De Lamo White & Jin, 2011; Fabiano-Smith, 2019; McLeod et al., 2017). Criteria-referenced measures (e.g., PCC, phonological processes, phonetic inventories,

intelligibility¹) and dynamic assessment to evaluate stimulability are recognised as being particularly effective to identify disorders in multilingual children (Castilla-Earls et al., 2020; De Lamo White & Jin, 2011; Fabiano-Smith, 2019; McLeod et al., 2017). These main elements may be complemented by other practices such as speech transcription with complete IPA, *contrastive* analysis of errors considering potential cross-linguistic effects, and assessment of speech perception skills and oro-motor movements (Fabiano-Smith, 2019; McLeod et al., 2017).

Perspectives and practices of SLTs across regions

SLTs' perspectives and practices in assessing multilingual children's speech production has been described in surveys conducted in different – but mostly English-speaking – regions (Australia: Williams & McLeod, 2012; Austria, Germany, Italy and Switzerland: Bloder et al., 2021; Canada: D'Souza et al., 2012; Canada, The Netherlands, UK and US: Marinova-Todd et al., 2016; France, Belgium and Canada: Estienne & Vander Linden, 2014; Ireland: Mulgrew et al., 2022; New-Zealand: Newbury et al., 2020; Poland: Zawadka et al., 2021; Singapore: Teoh et al., 2018; UK: Oxley et al., 2019; USA: Dubasik & Valdivia, 2021; Guiberson & Atkins, 2012). The results of these surveys will be presented for three aspects of practice with multilingual children: SLTs' knowledge, skills, and current assessment practices.

Three surveys investigated SLTs' knowledge regarding working with multilingual children. Some perspectives that have been reported are in line with current scientific evidence. For example, in studies by Bloder et al. (2021) in Austria, Germany, Italy and Switzerland and Oxley et al. (2019) in the UK, 72.0% of the SLTs agreed that assessment and

¹ Cut-off scores for these criteria-referenced measures are provided – when available – in Fabiano-Smith (2019) for monolingual English-speaking and bilingual English-Spanish-speaking children.

intervention should not be limited to the societal language, but should include all the child's languages. In Bloder et al.'s (2021) study, 89.7% of SLTs reported that parents of multilingual children should use their native language with their child rather than the societal language. Other results are more mixed. In Marinova-Todd et al.'s (2016) study in Canada, The Netherlands, UK and US, and in Oxley et al.'s (2019) study in the UK, almost all SLTs believed that children with mild or moderate disabilities may develop more than one language, but participants were more divided concerning children with severe disabilities. In Bloder et al. (2021), only 59.4% of SLTs thought that developmental language disorders were independent of speaking a second language.

In five studies, SLTs were asked how prepared they felt to work with multilingual children and their families (Estienne & Vander Linden, 2014; Guiberson & Atkins, 2012; Newbury et al., 2020; Williams & McLeod, 2012; Zawadka et al., 2021). In four of these studies, the majority of SLTs reported that they were not adequately prepared in their graduate training to work with multilingual children and their families: two thirds of SLTs in Zawadka et al.'s (2021) study in Poland, 67% in Newbury et al.'s (2020) study in New Zealand, 75.6% in Williams and McLeod's (2012) study in Australia, and 83% in Estienne and Vander Linden's (2014) study in France, Belgium and Canada. The proportion was lower in Guiberson and Atkins' (2012) study in the US, in which 51% of the SLTs felt competent to work with multilingual children. This difference may be related to variations of training opportunities depending on the region. For example, in Guiberson and Atkins (2012), 72% of participants indicated that they had received training related to cultural or linguistic diversity, either in graduate school, or in continuing education. In contrast, in D'Souza et al.'s (2012) study in Canada, only 23.8% of SLTs attended training to work with linguistically diverse clients. Across studies, the most frequently reported barriers to provide appropriate assessment to multilingual children were a lack of appropriate assessment tools, a lack of

developmental norms in other languages and about multilingual acquisition, not speaking the child's language(s), and the difficulty of differentiating speech differences from speech disorders (D'Souza et al., 2012; Dubasik & Valdivia, 2021; Estienne & Vander Linden, 2014; Guiberson & Atkins, 2012; Mulgrew et al., 2022; Oxley et al., 2019; Teoh et al., 2018; Zawadka et al., 2021). Other reported barriers were a lack of time, the difficulty to find SLTs speaking the child's language(s) or interpreters, and cultural differences (D'Souza et al., 2012; Estienne & Vander Linden, 2014; Oxley et al., 2019).

About assessment practices for multilingual children, a majority of SLTs reported using and relying on standardised test for diagnostic decision-making: 62.0% in Newbury et al.'s (2020) study in New-Zealand, 65.7% in D'Souza et al.'s (2012) study in Canada, 67.1% in Dubasik and Valdivia's (2021) study in the US, 84.0% in Mulgrew et al.'s (2022) study in Ireland, 84.8% in Williams and McLeod's (2012) study in Australia, and 85.0% in Estienne and Vander Linden's (2014) study among French-speaking SLTs in France, Belgium and Canada. Proportions were smaller in Guiberson and Atkins' (2012) study in the US in which 24.0% of SLTs reported using standardised tests, and in Oxley et al.'s (2019) study in the UK in which 43.0% of SLTs stated relying mainly on standardised tests compared to informal procedures. Using standardised tests does not, however, necessarily mean comparing a child's results to normative data. As an illustration, in Newbury et al. (2020), 62.0% of the SLTs surveyed in New Zealand used standardised tests but few participants compared results to norms. In Mulgrew et al. (2022), 84.0% of SLTs surveyed in the Ireland used standardised tests but only 78.0% used the norms. The use of standardised tests was complemented by informal procedures (such as naturalistic observation, parental reports, and discussions with parents) by a majority of SLTs in studies by D'Souza et al. (2012), Williams and McLeod (2012), Oxley et al. (2019), Newbury et al. (2020), Dubasik and Valdivia (2021), and Bloder et al. (2021). Dynamic assessment – an approach that focuses on a child's learning potential

and that is recommended as best practice with multilingual children – has been investigated in surveys from predominantly English-speaking countries. Ten years ago, dynamic assessment was used by 71.8% of Canadian SLTs in D’Souza et al. (2012) and by 71.9% of American SLTs in Guiberson and Atkins (2012). The proportion reached 85.2% of American SLTs in Dubasik and Valdivia’s study in 2021. Other assessment practices were reported, each in a single survey: case history (93.1% in Dubasik & Valdivia, 2021), seeking information about the phonology of the child’s other language and about the child’s culture (86.3% and 74.5% in Williams & McLeod, 2012), analysis of language samples (85.8% in D’Souza et al., 2012), use of criterion-referenced measures (45.5% in Dubasik & Valdivia, 2021).

Overall, these surveys showed that SLTs’ perspectives and practices in assessing speech production in multilingual children are not evolving uniformly across regions, and differences may be due to contextual variations (e.g., training, availability of tools in a given language, access to resources such as time or interpreters). The lack of data in non-English regions is problematic. Indeed, specific understanding of a situation is needed to develop context- and/or language-specific solutions – and ultimately improve clinical practice.

Although French is the 5th most spoken language in the world, data about SLTs’ perspectives and practices in French-speaking contexts are scarce (D’Souza et al., 2012; Estienne & Vander Linden, 2014).

SLTs’ practices and multilingualism in Belgium

Belgium is a small European country with three official languages: Dutch, French and German (*Les Communautés*, n.d.). Brussels, the capital, is known for its great linguistic diversity, with over 100 spoken languages from all over the world (*La capitale aux 104 langues*, n.d.). SLT are required to have completed a full course study in speech and language therapy at a higher education institution for at least three years (Arrêté Royal Relatif Au Titre Professionnel et Aux Conditions de Qualification Requises Pour l’exercice de La Profession

de Logopède, 1994). In 2017, Belgium had 113 SLTs per 100,000 inhabitants (Service Public Fédéral Santé Publique, 2017). No data are available on the number of multilingual children requesting or obtaining SLT services in Belgium. However, given that the proportion of children who speak a minority language at home is as high as 80% in Brussels (Extra & Yağmur, 2011), it can be assumed that multilingualism is commonplace in SLTs' caseloads in Belgium.

Aims

The present study aimed to 1) describe Belgian French-speaking SLTs' perspectives and practices in assessing the speech of multilingual children, 2) compare Belgian French-speaking SLTs' reported practices against current recommendations for best practice in assessing the speech of multilingual children, 3) understand the challenges and needs of SLTs working with multilingual children in French-speaking Belgium.

Method

Participants

The participants were 134 French-speaking SLTs working in Belgium. Inclusion criteria were to be a native speaker of French, to be working with children aged 3-7 years old, and to have experience working with children with SSD (monolingual and/or multilingual). Participants had between 1 and 43 years ($M = 13.1$, $SD = 11.0$) of clinical experience working with children who have SSD. In Belgium, a bachelor's or a master's degree is recognised as a professional qualification in speech-language therapy. In this study, 58.9% ($n = 79$) of the participants had a bachelor's degree, 36.6% ($n = 49$) had a master's degree, and 4.5% ($n = 6$) had both. A fifth of the SLTs ($n = 28$, 20.9%) had attended professional development training about working with multilingual children. Participants worked in private practices ($n = 111$, 82.8%), mainstream schools ($n = 58$, 43.3%), rehabilitation centres ($n = 28$, 19.4%), specialized schools ($n = 11$, 8.2%), and/ or hospitals ($n = 11$, 8.2%), with 59.7% ($n = 80$)

working in more than one setting. The majority of SLTs ($n = 93$, 69.4%) spoke only French, but 30.6% ($n = 41$) reported using more than one language. Nine different languages were spoken by the SLTs: English ($n = 20$, 14.9%), Dutch ($n = 10$, 7.5%), Spanish ($n = 6$, 4.5%), Belgian Francophone Sign Language ($n = 6$, 4.5%), Italian ($n = 4$, 3.0%), German ($n = 4$, 3.0%), Berber ($n = 1$, 0.7%), Catalan ($n = 1$, 0.7%), Arabic ($n = 1$, 0.7%).

Material

This study used a custom written survey that was developed in three phases. First, a survey was drafted based on literature regarding SLT practices for children with SSD and multilingual children (Diepeveen et al., 2020; Fabiano-Smith, 2019; McLeod et al., 2017; Williams & McLeod, 2012). From this literature, the topics we asked about were: assessment of multilingual children's speech production, goal-setting for multilingual children having SSD, and collaboration with families of multilingual children. Next, interviews were conducted with five SLTs, practicing in different clinical settings in French-speaking Belgium to identify possible extra topics to include in the survey. Qualitative thematic analysis (based on methods of Braun & Clarke, 2006) of interviews was undertaken and the findings were used to adapt the survey so that it was more appropriate to the clinical context in French-speaking regions and in Belgium. Finally, the updated survey was piloted with two SLTs who checked the clarity of the questions. The final survey included 39 questions. The current study only reports data from questions related to the assessment of multilingual children's speech production. First, participants were asked to express their agreement on a four-level Likert scale (totally agree, rather agree, rather disagree, totally disagree) with statements on their own practice in assessing multilingual children's speech production, and with evidence-based statements on multilingualism. Second, closed-ended questions gathered the elements SLTs included in the assessment of speech production. A list of items was proposed including recommended practices from the scientific literature (Blumenthal et al., 2015; Castilla-Earls

et al., 2020; De Lamo White & Jin, 2011; Fabiano-Smith, 2019; McLeod et al., 2017).

Recommended practices are shown in Table 1. For each item, participants had to answer the frequency of use on a four-level Likert scale (always, often, sometimes, never). One question asked if SLTs assessed the speech production in the home language and, if applicable, the reasons for not doing so. The survey was administered online using the LimeSurvey software (Schmitz, 2012).

Table 1. Recommended practices to assess multilingual children's speech production

Recommended practices
<ul style="list-style-type: none"> • Detailed case history including linguistic experience and parental concern • Single-words and connected speech samples in all the child's languages • Speech transcription with complete IPA • Calculation of criterion-referenced measures (e.g., PCC, phonological processes, phonetic inventories, intelligibility) and comparison to cut-off scores, if available • Contrastive analysis of errors (considering potential cross-linguistic effects) • Dynamic assessment to evaluate stimulability • Standardised test used in a descriptive way, but without comparison to monolingual norms • Assessment of speech perception skills • Assessment of oro-motor movements
<p>Note. References: Blumenthal et al., 2015; Castilla-Earls et al., 2020; De Lamo White & Jin, 2011; Fabiano-Smith, 2019; McLeod et al., 2017</p>

Procedure

Participants were recruited by sending the hyperlink of the survey by email, through SLT associations newsletters or publications, and within thematic groups on social media. The introduction of the survey mentioned inclusion criteria and definitions of the key-concepts (speech, multilingualism, age range of the children). The survey was available online for eighteen weeks (from November 2020 to February 2021). A reminder was sent after two, six and fifteen weeks.

Data analysis

The responses to closed, binary and Likert-style questions were analysed using descriptive analyses as frequencies, means, standard-deviations. Data were analysed using

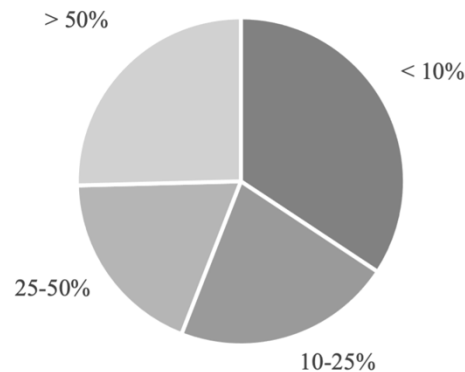
RStudio software (RStudio Team, 2020). The number of total responses varied per question as not every respondent chose to answer each question. Reported percentages exclude missing responses.

Results

Description of SLTs' caseloads

As shown on Figure 1, the proportion of multilingual children on the caseloads was less than 10% for 34.3% of the SLTs ($n = 46$), between 10% and 25% for 21.6% ($n = 29$), between 25 and 50% for 18.7% of SLTs ($n = 25$) and more than 50% for 25.4% of SLTs ($n = 34$). The participants were asked to name the languages of the last three multilingual children they worked with. A total of 323 responses were provided by 126 participants. Thirty-six different languages were reported. Three of the most frequently reported languages were Arabic dialects (referring to 24.5% of the children), Turkish (13.6%) and Polish (7.7%). These languages were rarely spoken by the SLTs in our sample: Arabic ($n = 1$, 0.6%), Turkish ($n = 0$), Polish ($n = 0$). The next languages were Dutch (8.4% of the children), Spanish (6.8%) and English (5.3%). These languages were the most spoken languages among the SLTs: Dutch ($n = 10$, 7.5%), Spanish ($n = 6$, 4.5%), and English ($n = 20$, 14.9%). The remaining 30 reported languages – referring to 33.7% of the children – were practically not spoken by the SLTs. Among the 323 responses, there were 19 matches (5.9%) between the languages spoken by the SLTs and the languages spoken by their multilingual clients. The languages shared between a SLT and at least one of their clients were English ($n = 4$), Belgian Francophone Sign Language ($n = 5$), Dutch ($n = 4$), German ($n = 3$), Italian ($n = 3$), and Arabic ($n = 1$).

Figure 1. Proportion of multilingual children on SLTs' caseloads



SLTs' perspectives about their practice with multilingual children

Participants were asked to agree or disagree with statements about their practice with multilingual children (see Table 2). For more clarity, the responses to four-level Likert scales have been grouped into two levels. A large proportion of the participants ($n = 110$, 82.1%) reported that their initial training has not adequately prepared them to work with multilingual children. The majority of SLTs stated a lack of knowledge (75.2%), tools (77.9%) and time (76.5%) to assess the speech production of multilingual children. More than half of the participants (63.1%) reported they don't feel confident in making a differential diagnosis between speech difference and speech disorder. More than two thirds of the participants (70.3%) expressed that multilingualism was a complication in their work with children who have speech or language difficulties. Finally, a large proportion of the participants (76.8%) reported that the reimbursement for SLT services was sometimes rejected by the health insurance because of the child's multilingualism. Participants who had attended professional training on working with multilingual children ($n = 28$, 20.9%) were asked to name the training they had attended. The reported trainings were exclusively in French. Participants

mentioned two different instructors (one Canadian and one French), and two third of the SLTs had attended the same single event in Belgium in 2018.

Table 2. SLTs' perspectives about their practice with multilingual children

	<i>n</i>	Disagree	Agree
My initial training has adequately prepared me to work with multilingual children	134	82.1%	17.9%
I have enough knowledge to assess with multilingual children	105	75.2%	24.8%
I have enough tools to assess multilingual children	104	77.9%	22.1%
The assessment of a multilingual child with speech difficulties requires the same time as for a monolingual child	102	76.5%	23.5%
I feel confident in distinguishing a speech disorder from a speech difference in a multilingual child	103	63.1%	36.9%
Multilingualism is a complication for the SLTs who work with children having speech or language difficulties	128	29.7%	70.3%
Reimbursement for SLT services is sometimes rejected by health insurance because of the child's multilingualism	99	23.2%	76.8%

SLTs' knowledge on multilingualism

Participants were asked to agree or disagree with evidence-based statements on multilingualism (see Table 3). SLTs expressed some evidence-based knowledge. A high proportion of them agreed with the fact that children with speech or language difficulties may acquire more than one language (79.1%) and that parents should not speak French – the majority language – in place of their native language to their multilingual child with speech or language difficulties (78.4%). However, SLTs expressed some beliefs that are not evidence-based. A third of the participants (34.3%) believed that multilingualism is a risk for speech and language acquisition, and two thirds (70.2%) believed that multilingualism is a complication for children with speech or language difficulties. Finally, 85.1% of the SLTs said that they could not assess the speech of a multilingual child in a language that they did not speak or did not speak well.

Table 3. SLTs' knowledge on multilingualism ($n = 134$)

	Disagree	Agree	Don't know
Children with speech or language difficulties may develop more than one language	13.4%	79.1%	7.5%
Parents should speak French rather than their native language to their multilingual child with speech or language difficulties	78.4%	18.6%	3.0%
Multilingualism is <i>not</i> a risk for speech and language development	34.3%	59.0%	6.7%
For children with speech or language difficulties, multilingualism is a complication	25.4%	70.2%	4.4%
SLTs can assess the speech of a multilingual child in a language they don't speak (well)	85.1%	11.2%	3.7%

Practices in assessing the speech production of multilingual children

One hundred and seven participants described their practices in assessing the speech production of multilingual children.

Case history

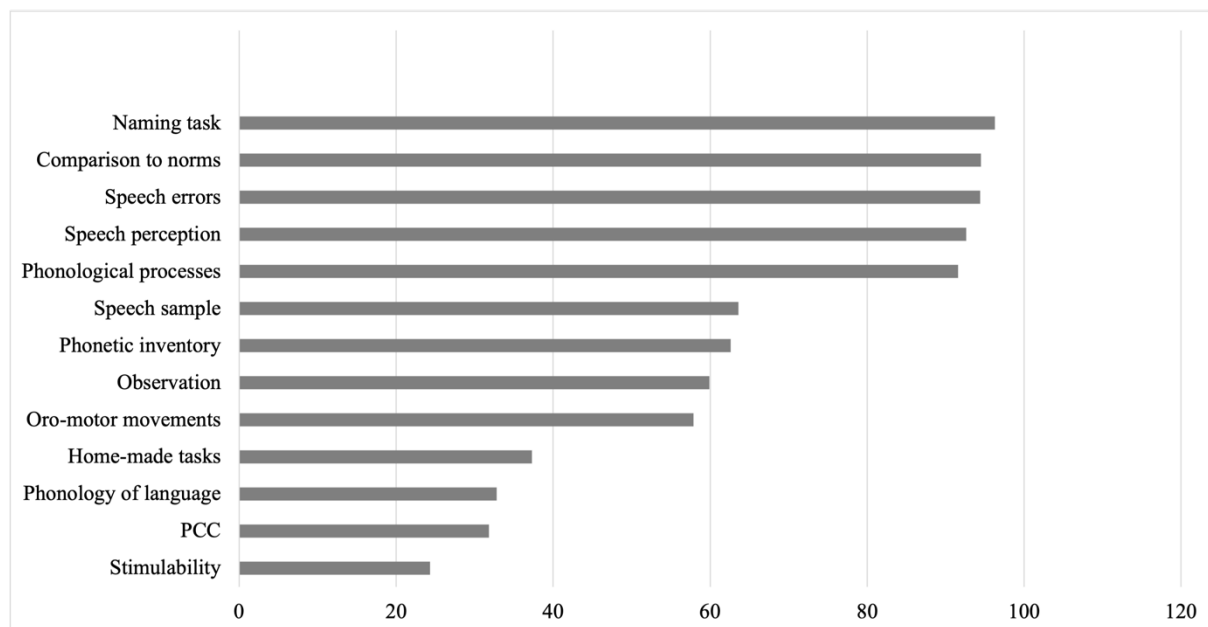
When assessing a multilingual child, almost all SLTs ($n = 102$, 95.3%) always took a case history. Within the case history, 91.3% of SLTs addressed medical questions (pregnancy, birth, family history, disease), 84.6% addressed language development (onset of babbling, first words in each language, difficulties), 82.6% addressed multilingual experience (age of onset, proportion of exposure, diversity of contexts, dominance), and 55.1% addressed the family's wishes regarding the child's multilingual development.

Assessment of speech production in French

Participants were asked how often they include different practices when they assessed the speech production of multilingual children in French. Figure 2 shows the percentages of SLTs who answered *always* or *often* for each practice. Some practices were highly prevalent: almost all SLTs reported using standardised naming tasks (96.3%), comparing the child's score to norms (94.5%), analysing speech errors (94.4%) and phonological processes (91.6%), and assessing speech perception skills (92.6%). Some practices were less frequently

mentioned: more than half of the SLTs reported using partial² IPA for speech transcription (70.2%), analysing a speech sample (63.6%), calculating phonetic inventory (62.6%), observing the child in real situations (59.9%) or assessing oro-motor movements (57.9%). Some practices were only used by a minority of SLTs: about a third of them reported using home-made tasks (37.3%), comparing the phonological structure of French to that of the child's other language (32.8%), calculating the percentage of consonant correct (PCC) (31.8%), assessing the stimulability (24.3%, and 41.1% reported ignoring what it is), or using complete IPA for speech transcription (13.5%). Finally, most SLTs (82.2%) reported assessing intelligibility but this result is not consistent with the low percentage of SLTs (31.8%) calculating the PCC, and the low percentage of SLTs (2.8%) using intelligibility scales like the Intelligibility in Context Scale (ICS; McLeod et al., 2012).

Figure 2. Practices of speech assessment in French (% of SLTs who include each practice)



² IPA symbols of French phonemes only

Participants ($n = 106$) were asked to indicate if they used or knew a list of tasks available in French. Almost all SLTs (more than 94.0%) knew the standardized and normed tasks that are available in French (and accepted by Belgian health insurance to determine eligibility for reimbursement). The most used were the naming tasks from standardized tests: 100.0% used the naming task from the Nouvelles Epreuves pour l'Examen du Langage (NEEL; Chevrie-Muller & Plaza, 2001), 84.9% from the Evaluation du Langage Oral (ELO; Khomsi, 2001), 70.8% from the Exalang 3-6 (Helloin & Thibault, 2006) and 55.7% from the Evalo 2-6 (Coquet et al., 2009). However, a minority of SLTs knew assessment tools responding to the recommendations to assess the speech production of multilingual children: 35.8% knew the Evaluation Sommaire de la Phonologie chez les enfants d'âge Préscolaire (ESPP; MacLeod, 2014), 41.5% knew the ICS (McLeod et al., 2012), 25.5% knew the Focus on Outcomes of Communication Under Six-French (FOCUS-F; Thomas-Stonell et al., 2010), 27.4% knew the Litmus nonword repetition test (LITMUS-NWR-FRENCH; dos Santos & Ferré, 2018), and 22.6% knew the Questionnaire for Parents of Bilingual children (PABIQ; Tuller, n.d.).

Assessment of speech production in the home language

The majority of the SLTs ($n = 89$, 83.2%) never assessed the speech production of multilingual children in their home language(s). Eighty-five participants gave the reasons why they did not assess speech production in the home language. Responses were coded (133 comments) and the reasons mentioned by the SLTs were categorized as follows: (a) not speaking the family language ($n = 43$, 33.8%), (b) lacking appropriate tools ($n = 26$, 19.5%) or knowledge ($n = 13$, 9.8%), (c) lacking external resources such as interpreters, native SLTs, time or institutional approval ($n = 8$, 6.0%), (d) never thought to do it ($n = 2$, 1.5%), (e) initial request being about French and not about the home language ($n = 1$, 0.8%), and (f) difficulties to communicate with parents about the speech production in the home language ($n = 1$, 0.8%).

Nevertheless, some SLTs reported practices to *estimate* the speech production skills in the home language: indirect assessment through discussions with parents ($n = 23$, 17.3%), referral to a SLT who is a native speaker of the child's home language ($n = 9$, 6.8%), observation of parent-child interaction ($n = 3$, 2.3%), naming task in collaboration with the parents ($n = 1$, 0.8%).

For the SLTs who assessed the speech production of multilingual children in the home language ($n = 16$), most of them reported analysing errors (75.0%), observing the child in real situation (68.8%), analysing phonological processes (62.5%), using homemade tasks (56.3%) or standardized naming tasks (56.3%), and analysing speech sample (50.0%). Some SLTs reported assessing speech perception skills (42.5%), calculating the phonetic inventory (43.8%), assessing the stimulability (43.8%), comparing the child's score to norms (37.5%) or calculating PCC (12.5%).

Discussion

This study examined the perspectives and practices of SLTs in French-speaking Belgium in relation to assessing the speech production of multilingual children. The perspectives of SLTs about their practice with multilingual children were generally negative. For example, two thirds of the participants saw multilingualism as a complication in their work. The comparison of SLTs' current practices against recommendations for best practice in assessing the speech of multilingual children reveals that the shift to more appropriate approaches is in its infancy among SLTs in French speaking Belgium. The discussion of results is organised around identified needs and possible solutions to improve clinical practice in assessing the speech production of multilingual children.

Linguistic diversity is far from being an exception on Belgian French-speaking SLTs' caseloads. Multilingual children represented a significant proportion on SLTs' caseloads. They spoke various home languages that rarely matched the languages spoken by the (few)

multilingual SLTs (5.9% of cases). This mismatch is similar to findings in other countries (Bloder et al., 2021; D’Souza et al., 2012; Dubasik & Valdivia, 2021; Guiberson & Atkins, 2012; Newbury et al., 2020; Oxley et al., 2019; Williams & McLeod, 2012). Therefore, it is unrealistic to believe it is possible for multilingual children to be seen by a multilingual SLT who speaks the same languages as the child. SLTs have no choice but to be competent to respond to multilingualism and linguistic diversity.

Most participants felt inadequately prepared to work with multilingual children. A large proportion of participants (82.1%) reported insufficient training in their graduate education. Weakness in graduate education regarding practice with multilingual children has been described in previous surveys (Estienne & Vander Linden, 2014; Williams & McLeod, 2012) and continues to be reported in recent studies (Newbury et al., 2020; Zawadka et al., 2021). Given SLTs did not feel adequately prepared, it was surprising that only a fifth of them had attended professional training. This may be explained by access to training opportunities being limited in terms of many factors, such as frequency, geography, number of instructors, and language of instruction. As an example, we noted that French-speaking SLTs had exclusively attended training in French. Efforts are necessary to provide greater training in local languages to increase SLTs’ preparedness to work with multilingual children.

Participants expressed some evidence-based knowledge, but some myths remain. A high proportion of the participants agreed that children with speech or language disorders may develop more than one language, but more than two thirds believed that multilingualism is a complication for these children. This is consistent with previous surveys in which participants largely agreed that children with mild disorders could become multilingual, but that this was less likely to be a possibility for children with severe disorders (Marinova-Todd et al., 2016; Oxley et al., 2019). Yet, there is limited evidence supporting the view that multilingualism may have a detrimental effect on the language development of children with disorders

affecting communication (Uljarević et al., 2016). Some SLTs considered that multilingualism was a risk for the development of speech and language. Belief in this myth was also found by Bloder et al. (2021), even though evidence has shown that multilingualism does not slow down or compromise speech or language acquisition (McLeod & Goldstein, 2012). Another myth was identified in 85% of the participants who didn't know they could (and should) assess a child's speech in his/her home language, even if they do not speak the child's home language or do not speak it well. SLTs need to have more evidence-based knowledge about multilingual children but also about their role with these children.

SLTs' current practices in assessing multilingual children predominantly included a norm-referenced approach. The norm-referenced approach was also reported as the main assessment approach in previous surveys conducted among French- and English-speaking SLTs (Dubasik & Valdivia, 2021; Estienne & Vander Linden, 2014; Mulgrew et al., 2022; Newbury et al., 2020; Williams & McLeod, 2012). Its use was reported, but to a lesser extent, in Guiberson and Atkins' (2012) study in the US and in Oxley et al.'s (2019) study in the UK. This practice remains even though it is contraindicated in assessment of the speech of multilingual children (Blumenthal et al., 2015; Castilla-Earls et al., 2020; De Lamo White & Jin, 2011; Fabiano-Smith, 2019; McLeod et al., 2017).

Regarding recommended assessment practices, the use of PCC as a criterion-referenced measure was reported by a minority of participants, as in the only other survey that investigated this practice (Dubasik & Valdivia, 2021). Dynamic assessment was rarely used by participants in this study, contrasting with the large proportion of SLTs who reported this practice in English-speaking surveys (Dubasik & Valdivia, 2021; Guiberson & Atkins, 2012; Williams & McLeod, 2012). This may be explained by the fact that while resources for dynamic assessment are emerging in English (Glaspey et al., 2022), they are lacking for French and many other languages. A dynamic assessment task was recently created in French

to assess monolingual and bilingual children (Matrat et al., 2023), but it focuses on word learning rather than speech production skills. Few participants assessed the child's speech in their home language. The combination of informal procedures was part of current practice for most of the participants, as in previous surveys (Bloder et al., 2021; D'Souza et al., 2012; Dubasik & Valdivia, 2021; Newbury et al., 2020; Oxley et al., 2019; Williams & McLeod, 2012), but mostly when assessing speech production in French and few in the home language. SLTs analysed the child's speech errors in French but few in relation with the other language's phonology although it could allow to distinguish errors between cross-linguistic effects and true disorders. The majority of SLTs transcribed speech but they used partial IPA instead of complete IPA as recommended (McLeod et al., 2017). SLTs' current practices only partially met recommendations for best practice in assessing the speech of multilingual children.

More than half of the SLTs (63.1%) did not feel confident in making a differential diagnosis between speech difference and disorder in multilingual children. The difficulty in differential diagnosis was previously reported by 63.0% of American SLTs (Guiberson & Atkins, 2012) and 45.9% of Canadian SLTs (D'Souza et al., 2012), but only by 18.5% in a more recent American survey (Dubasik & Valdivia, 2021). This difficulty in differential diagnosis may be due to the use of inappropriate assessment practices and lack of knowledge about multilingualism. Another factor could be the lack of assessment tools, as reported by 77.9% of participants. It should be noted that appropriate tools – even some in French – exist to support practice with multilingual children. For example, assessment material in many languages is available on the *multilingual children's speech* website (McLeod, 2022), or on the *ALoA Diversité* website (van der Straten Waillet, n. d.). These tools were not widely known by the participants in this study. Moreover, even tools that were known were practically not used. For example, 41.5% of the participants knew the Intelligibility in Context

Scale (McLeod et al., 2012) but only 2.8% used it. Almost all SLTs included questions on linguistic environment in the case history and while 22.6% of them knew the PaBiQ questionnaire (Tuller, n.d.), only 1.9% used it. Among other solutions, efforts to disseminate appropriate tools should help SLTs address the challenge of differential diagnosis in multilingual children.

Several means could be employed to bridge the research-practice gap. Yet, it should be remembered that clinical settings are complex, and implementation of recommended practices requires context-specific guidance. In this regard, Douglas and Burshnic (2019) suggested that implementation science³ may be used to improve SLT services.

Implementation science includes, for example, tailor-made workshops targeting behaviour change, and involvement of clinicians in the implementation process. Solutions at the clinician level can help improve SLT practice to be more consistent with recommendations.

Policy level barriers to implementing evidence-based practices were identified, such as the lack of time allocated for assessing multilingual children. The lack of time may explain why some recommendations were only partially implemented. The assessment of multilingual children's speech requires additional time compared to assessing monolingual children's speech. Additional time is necessary to assess skills in more than one language, and to collect data from multiple sources as required for a converging evidence approach. Additional time is also needed to provide SLTs opportunities to interact with the parents (e.g., to assess the speech production in the home language(s), to discuss the linguistic experience). Language barrier between SLTs and parents of multilingual children may lead to miscommunication (Bloder et al., 2021; D'Souza et al., 2012; Estienne & Vander Linden, 2014; Guiberson &

³ The study of methods used to promote systematic uptake of research into routine clinical practice and to improve patient outcomes and service quality

Atkins, 2012; Oxley et al., 2019). Further, strategies to overcome the language barrier, such as adapting verbal communication, using translation tools, or interpreters, take time. Revising health policies to allocate additional time is a global need, as shown in the IEPMCS position paper (2012).

The Belgian context presents a specific need for the revision of health policies. Belgian health insurance imposes the use of a norm-referenced approach to obtain reimbursement for SLT services (Arrêté Royal Établissant La Nomenclature Des Prestations de Santé, 2003, art.36, §2). This can explain the extensive use of this approach by Belgian SLTs and the difficulty to implement recommended practices even after attending quality training. Moreover, the reimbursement for SLT services is excluded for disorders *caused* by second language acquisition or multilingual education (Arrêté Royal Établissant La Nomenclature Des Prestations de Santé, 2003, art.36, §3). These rules reveal a confusion between difference and disorder, and maintain myths and negative attitudes towards multilingualism. In addition, it discriminates against families of multilingual children who are less likely to get reimbursement for SLT services. This feature of the Belgian context is a very clear example of how distal elements in the environment can have an indirect but significant impact on the development of a child (De Lamo White & Jin, 2011). Improving SLT practice with multilingual children engages all the components of the child's environment from the individual level to the systemic level.

Limitations and future research

The current study has some limitations and raises new questions that provide opportunities for future research. As the survey was conducted online, participants were self-selected, and it is possible that those with a greater interest or stronger opinions about multilingualism were over-represented in our sample. This may have introduced bias in some findings (e.g., feeling prepared to work with multilingual children). Future research could use

an alternative recruitment procedure to include a more population-based sample that would be more representative of all clinicians. Only a portion of the Belgian SLTs – only French-speaking SLTs – were invited to participate. It would be interesting to investigate the perspectives and practices of the Dutch- and German-speaking SLTs in Belgium to see if the influences of health policies are similar, and what could be improved locally regardless of language. Finally, future research should not only highlight challenges in SLT clinical practice, but investigate the efficacy of targeted solutions to improve SLT knowledge, confidence, and use of evidence-based clinical practices in the assessment of multilingual children's speech in French-speaking contexts, such as through implementation science paradigms.

Conclusion

This work provides insights into the perspectives and practices of SLTs in French-speaking Belgium about working with multilingual children, focusing on the assessment of speech production. The results show limited implementation of recommended practices in assessing the speech production of multilingual children among French-speaking SLTs: the norm-referenced approach to assessment was predominant and few SLTs used criterion-referenced measures, dynamic assessment or assessed the child's speech production in the home language. While these are common issues for SLTs in many regions of the world, the findings of this study show that the shift to more appropriate practices with multilingual children and their families may be progressing differently across countries and between groups of SLTs who speak different languages. Challenges were also identified that related specifically to practice in French-speaking contexts (e.g., lack of French tools) and Belgian context (e.g., health policies unfavourable to multilingualism). Efforts to improve practices in French-speaking contexts should focus on increasing understanding and consideration of

cultural and linguistic diversity at all levels of child's environment and the rapid implementation of international scientific recommendations.

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