

# Features of culturally and linguistically relevant speech-language assessments for Indigenous children: A scoping review

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## Abstract

**Introduction:** Indigenous children may be at higher risk of being misdiagnosed with speech-language difficulties due to Eurocentric practices in health care and education. The use of conventional speech pathology assessment practices contributes to inappropriate disorder identification, further stigmatising a vulnerable population. Few resources are available for speech pathologists, which examine the cultural and linguistic relevance of assessments for this population.

**Objective:** To provide important features for speech pathologists to account for when building assessment plans for Indigenous children.

**Design:** This comprehensive scoping literature review was completed using the Arksey and O'Malley 6-step methodological framework, including the optional consultation exercise, and reported using the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines. To be included, studies needed to have been published since 2000, discuss speech-language assessments and involve a significant proportion of Indigenous participants under 7 years old.

**Findings:** Three features were extracted from 32 studies that discussed First Nations, Métis, Inuit, Native American, Aboriginal and Torres Strait Islander communities: using a battery of resources including alternative approaches, ensuring authenticity and cultural relevance, and considering a child's linguistic characteristics.

**Conclusion:** While there remains a need to adapt according to a specific child's reality, this study provides a guideline for all allied health clinicians when they are building their culturally and linguistically relevant assessment plans.

## KEYWORDS

assessment, indigenous children, scoping review, speech-language pathology

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## 1 | INTRODUCTION

Indigenous people experience significant health inequities and a higher prevalence of health issues than their non-Indigenous counterparts, primarily stemming from both historical and contemporary Eurocentric colonial practices in health care and education.<sup>1</sup> In the field of speech pathology, the use of conventional assessments often fails to accurately reflect Indigenous children's true communication abilities.<sup>2</sup> This limitation can result in the inappropriate identification of disorders, leading to lasting negative impacts on education and health.<sup>3</sup> Although a recently published review, Zupan et al.,<sup>4</sup> explored assessments with this population, this review stands out by its international focus, which also draws out common features of culturally and linguistically relevant assessments that can be applied to all allied health professions.

### 1.1 | Population differences

Despite the increasing visibility of this issue, culturally discordant services continue to be a problem for Indigenous people from First Nations, Métis, Inuit, Native American, Aboriginal and Torres Strait Islander communities.<sup>2,5</sup> Examples drawn from the first author's personal experiences include service providers enforcing rigid schedules and attitudes that disregard the rural and colonial realities faced by many Indigenous families.

As all facets of assessments are influenced by a person's culture and language, biases may arise against Indigenous children<sup>6</sup> due in part to a lack of cultural relevance.<sup>2</sup> To illustrate, the biomedical health care model prioritised in Western cultures focuses on health in isolation without considering broader contexts.<sup>7</sup> In contrast, Indigenous health care approaches emphasise relationships, experiences and participation.<sup>2</sup> Additionally, the assessment context is shaped by a child's educational experience, exposure to Western testing and the family's engagement with services, influenced by their personal or anticipated experiences of cultural violence in health care and education.<sup>6</sup>

Finally, the assessment content that encompasses approach, materials and instructions should be authentic to the child's experiences. As children learn to communicate from models in their environment, language differences may emerge, which should not be confused with a language disorder.<sup>8</sup> In Indigenous communities, many people use the majority Western language (e.g. English in Australia) as a second language or use a dialect of that language, which can vary considerably from dialects of the same language.<sup>3</sup> For instance, many Australian Aboriginal English speakers omit the verb 'to be', which may be an influence from their traditional language.<sup>9</sup> However, when

#### What is already known about this subject

- The use of conventional assessments in speech-language pathology disadvantages Indigenous children.

#### What this study adds

- This scoping review synthesises literature regarding the features of culturally and linguistically relevant assessments of Indigenous children applicable to all allied health clinicians.
- Features: Use a battery of resources that includes alternative assessments; ensure authenticity and cultural relevance; and consider the child's linguistic characteristics.

non-adapted assessments are employed, children are tested on their proficiency in the mainstream dialect.

In general, the lack of culturally and linguistically relevant speech-language assessments creates a barrier to accessing services for many families and can inadvertently pathologise cultural differences.<sup>2</sup>

### 1.2 | Speech-language assessment practices

Speech pathologists assess verbal and non-verbal communication using elements universal to most allied health clinicians such as case history reviews, family interviews, and the administration and interpretation of assessment procedures.<sup>10</sup> These assessment procedures typically fall into three categories: norm-referenced, criterion-referenced, and alternative. However, it is crucial to recognise that not all approaches are appropriate for Indigenous children.

Norm-referenced approaches, used widely in Western assessment practices,<sup>6</sup> rely on standardised procedures to compare a child's abilities to normative data collected from a similar group.<sup>11</sup> While these assessments can contribute to determine whether a child meets the criteria for a diagnostic label, they have limited suitability for goal setting<sup>12</sup> and may not accommodate alternative but valid answers.<sup>6</sup> Additionally, norm-referenced assessments often lack sufficient representation of Indigenous children in their normative samples.<sup>4</sup>

Criterion-referenced approaches assess skill acquisition by comparing performance against predetermined criteria.<sup>13</sup> Generally considered more suitable for culturally diverse populations than norm-referenced approaches,<sup>12</sup> concerns arise about the appropriateness of the developmental milestones upon which the criteria are based,

given the limited knowledge about typical Indigenous childhood development.<sup>12</sup>

Recognising these limitations, alternative approaches are gaining recognition for assessing Indigenous children.<sup>11,13</sup> Language sample analysis (LSA) involves evaluating transcribed communicative interactions, while observational assessment provides a passive view of communication in different environments.<sup>13</sup> While these approaches capture more naturalistic environments,<sup>11</sup> they lack consistency in collection and analysis methods. Dynamic assessment (DA), a broad term that encompasses test–teach–retest, graduated prompting and testing the limit approaches,<sup>14</sup> allows a child to demonstrate their ability to learn a new task.<sup>13</sup> This emphasises understanding over specific experience.<sup>14</sup>

### 1.3 | Objectives

This scoping literature review aims to assist speech pathologists in developing assessment plans for Indigenous children. As the limited research available on assessment with Indigenous children spans vast geographic and cultural differences, and scientific approaches, a scoping review was chosen for its ability to encompass these ranges. Given the diversity of Indigenous populations, seeking generalisability is unwise. However, valuable insights can be derived from international research and adapted, with clinical judgement, to children from different Indigenous communities. As such, this review will explore the context and content of speech-language assessments to address the research question: *What features characterise relevant speech-language assessment practices with young Indigenous children?*

### 1.4 | Positioning the researcher

The first author, a first-generation Canadian settler with Hungarian and English heritage, was raised in rural Quebec and is a PhD candidate and currently serves as a speech pathologist working with First Nations families in Northern Ontario. She has a clinical and research relationship with Dokis First Nation, an Anishinaabek community. The second author, a French-Canadian hailing from rural Quebec, is also a speech-pathologist and adjunct professor in Northern Ontario.

## 2 | METHODS

The scoping review protocol followed the Arksey and O'Malley methodological framework,<sup>15</sup> including the consultation exercise, and is reported following the Preferred

Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines.<sup>16</sup> A research assistant served as the second reviewer during the sources of evidence selection and data charting.

To be included in this review, the articles needed to discuss speech-language assessments and involve a significant proportion of Indigenous participants under 7 years old. To clarify the research question, definitions were established for the four key elements (see [Appendix 1](#) for detailed eligibility criteria). *Speech-language* encompasses aspects of verbal and nonverbal communication assessable by speech pathologists in oral or written forms.<sup>10</sup> *Assessment* refers to the tools, techniques and approaches used to determine speech-language ability.<sup>10</sup> As per United Nations guidelines, *Indigenous people* encompasses members of Indigenous communities in North, South and Central America, circumpolar and Oceanic regions.<sup>17</sup> *Young children* were defined as birth to 6 years; 11 months.

Original research from the scientific literature published since 2000 was included. Articles not in English or French were excluded as these are the authors' fluent languages. To minimise confounding variables, studies discussing participants with biomedical conditions where a language disorder may co-occur, such as autism spectrum disorder, were excluded.

Electronic databases were searched by the first author for relevant records dating from January 2000 to December 2023. Searches were conducted in August 2020 and in December 2023 to ensure inclusion of the most recent publications in this scoping review. The search engines included CINAHL, Embase, ERIC, Google Scholar, ProQuest Nursing and Allied Health, ProQuest Dissertations and Theses, PubMed, Theses Canada and Web of Science. Additional records were found through hand-searching of relevant review papers' references.

All databases searches used the following search terms: (communication, speech, language, literacy, phonolo\*, articulat\*, fluency, stutter\*, or pragmatic\*) and (assess\*, evaluat\*, test\*, measur\*, task\*, tool\*, protocol\*, or diagnos\*) and (Indigenous, First Nation, Aborigin\*, Metis, Inuit, American Indian\*, or Native\*) and (infant\*, preschool\*, early childhood, or kindergar\*). For databases with thesaurus or mapped terms (i.e. CINAHL, Embase, ERIC, PubMed, ProQuest Nursing and Allied Health, and Web of Science), equivalent terms were identified, and a second search was conducted (See [Appendix 2](#) for the full search terminology). This approach was adopted after a preliminary PubMed search indicated that MeSH thesaurus and custom search terms did not yield mutually inclusive article lists.

Online database search results were imported into DistillerSR.<sup>18</sup> After removing duplicates, two reviewers

independently screened articles by title and abstract, followed by full text. Title and abstract screening disagreements led to inclusion in the next phase and full-text screening discrepancies were resolved by consensus. Quotes to be extracted in such areas as participant demographics, study and assessment procedures, outcomes and recommendations were identified a priori by the first author. In a preliminary round, five articles were independently charted which led to vocabulary fine-tuning via consensus. The two reviewer's responses were then integrated into a single data set which contained a 98.5% agreement rate. Discrepancies resulted from reviewers extracting different but complimentary quotes from source articles.

To contextualise the studies, they were first outlined in terms of the characteristics of the sources of evidence such as procedures, participant characteristics and assessment context. Then, the authors' discussion of the analyses of the assessments, categorised via thematic synthesis, was examined to explore the features of culturally and linguistically relevant assessments that they recommended.

Engaging in the Arksey and O'Malley consultation exercise,<sup>15</sup> the preliminary results of this review were shared with a group of residents of Dokis First Nation in October, 2022. They were asked to share their thoughts on and interpretations of this research, which is used to enrich the discussion.

### 3 | RESULTS

#### 3.1 | Selection of sources of evidence

Figure 1 shows that once duplicates were removed, database searches revealed 4789 references. Title and abstract screening led to 4600 rejections and full-text screening enabled the further exclusion of 157 articles, which led to 32 articles being considered within this review.

#### 3.2 | Characteristics of sources of evidence

To better understand the studies in relation to the research question, Table 1 details study procedures, participant characteristics and assessment context.

The research methodologies employed were predominantly quantitative (88%), with some qualitative,<sup>19–21</sup> and only one using an indigenous methodology.<sup>22</sup> Publication years spanned 2000 to 2022, with most articles published in the last decade. The diverse aims of the reviewed studies primarily sought to describe a population's language ability or learning patterns, test the assessment's usefulness (e.g. representativeness, reliability), or create a new assessment.<sup>21,23,24</sup> The involvement of Indigenous people in knowledge generation about them has been highlighted

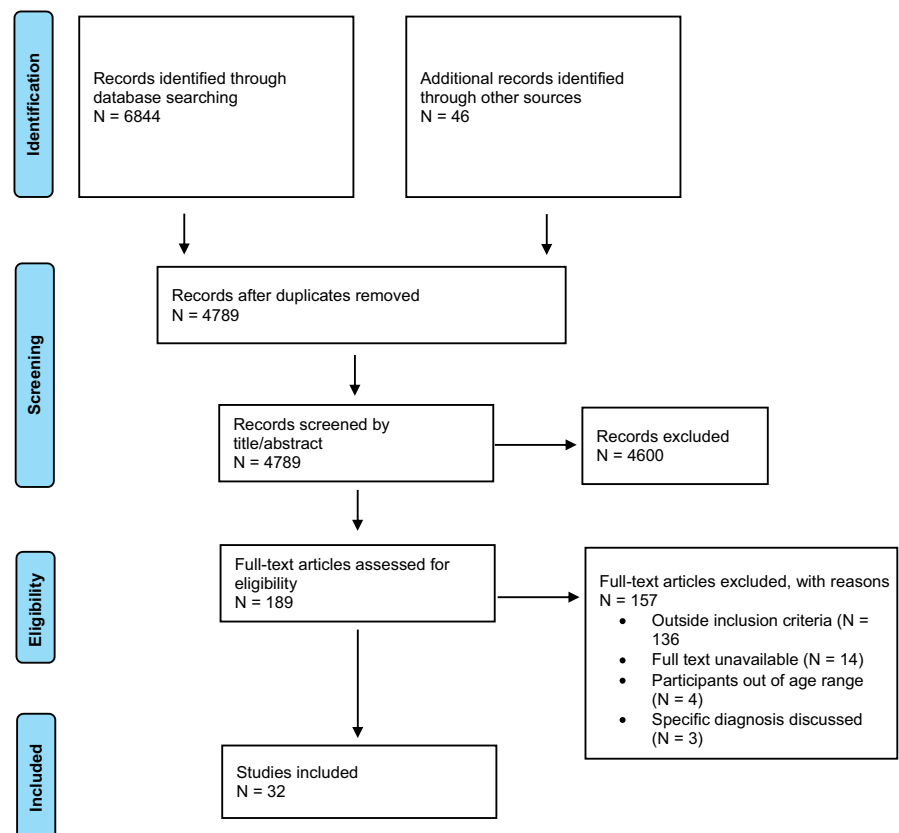


FIGURE 1 Scoping review flow diagram.

TABLE 1 Characteristics of sources of evidence.

Study procedures	Participant characteristics					Assessment context		
	Indigenous involvement	Limitations	Age	Home dialect or language	Country	Indigenous community <sup>a</sup>	Administered by	Setting
Allen & Dench <sup>26</sup>	NA	Sample	1;8–5;4	Inuktitut	Canada	Inuit	RA	Home
Ballard & Faraio <sup>28</sup>	Team	Sample, demographics	4;0–4;11	Samoan/English	New Zealand	Samoa	Samoan speech pathology student	School
Bengochea et al. <sup>27</sup>	Team	Sample, methodology	3;4–5;10	Yucatec Maya/Spanish	Mexico	Maya	Bilingual RA	School
Eisazadeh et al. <sup>39</sup>	Team	Sample	JK–SK	English (FNED)	Canada	Ojibwe	Teacher, researcher	School
Fletcher et al. <sup>23</sup>	Team	Sample	6;0–9;10	Anindilyakwa/English	Australia	Warmindhilyagwa	Anindilyakwa researcher	School
Godfrey & Galloway <sup>44</sup>	Team	–	Grade 1	English	Australia	Aboriginal	Teacher, researcher, Indigenous school staff	School
Gould <sup>19</sup>	Acknowledge	Non-Indigenous	Preschool	English	Australia	Aboriginal	Speech pathologist	School
Haitana et al. <sup>22</sup>	Team	Sample, methodology, procedure	5;0 – (10;9)	English or Māori/English	New Zealand	Māori	Unspecified	Multiple
Hart Blundon <sup>25</sup>	Team	Non-Indigenous, sample	K – (Grade 1)	English (FNED)	Canada	First Nations	Non-Indigenous speech pathologist	School
Henderson <sup>36</sup>	Acknowledge	Demographics	5;6	English/Navajo	USA	Navajo	Unspecified	Unspecified
Leigh & Gong <sup>37</sup>	NA	Methodology	4;0–5;11	English	Australia	Aboriginal and Torres Strait Islander	Unspecified	Unspecified
Loakes et al. <sup>24</sup>	Team	Sample, demographics	4;0 – (12;8)	Kriol, Walmajarri, Warumungu, Gurindji or Nyikina	Australia	Walmajarri	Researcher	School
McConnell & Loeb <sup>42</sup>	Acknowledge	Sample, demographics, methodology	5;6 – (8;9)	English	USA	Kickapoo Nation	speech pathologist, speech pathology student	Unspecified
McDonald et al. <sup>30</sup>	Acknowledge	Methodology	2;10–3;10	English	Australia	Aboriginal	Unspecified	Multiple
McLeod et al. <sup>32</sup>	Team	Sample, procedure, methodology	3;0–7;6	English, Indigenous language, Creole or other	Australia	Aboriginal and Torres Strait Islander	Indigenous RA	Community building
Miller et al. <sup>29</sup>	Acknowledge	Sample, methodology	4;1–4;9	English (AAE)	Australia	Aboriginal	Non-Indigenous speech pathologist	Multiple
O'Reilly & Peterson <sup>49</sup>	NA	Sample	4;1–4;3	English (AAE)	Australia	Bundjalung and Yuggera	Researcher	Unspecified
Pearce & Flanagan <sup>35</sup>	Acknowledge	Sample	4;10–6;5	English (AAE or SAE) or Torres Strait Islander Creole	Australia	Aboriginal and Torres Strait Islander	Non-Indigenous speech pathologist, Indigenous TA	School

TABLE 1 Continued

Study procedures	Participant characteristics					Assessment context		
	Indigenous involvement	Limitations	Age	Home dialect or language	Country	Indigenous community <sup>a</sup>	Administered by	Setting
Pearce & Flanagan <sup>20</sup>	Team	Sample, non-Indigenous, procedure, methodology	4;10–6;5	English (AAE or SAE) or Torres Strait Islander Creole	Australia	Aboriginal and Torres Strait Islander	Non-Indigenous speech pathologist, Indigenous TA	School
Peterson <sup>21</sup>	Acknowledge	Sample	4;0–6;11	English (FNED)	Canada	First Nations	Teacher	School
Peterson et al. <sup>41</sup>	Team	Sample	K	English	Canada	First Nations	Researcher	School
Shoebri et al. <sup>34</sup>	Acknowledge	Sample, methodology	4;11–6;5	English (AAE or SAE)	Australia	Aboriginal and Torres Strait Islander	Non-Indigenous speech pathologist, Indigenous TA	School
Short et al. <sup>31</sup>	Team	Sample, methodology	2;11–3;11	English	Australia	Aboriginal	Unspecified	Hospital
Stage et al. <sup>43</sup>	NA	Sample	K	English	USA	Native American	Unspecified	School
Styles et al. <sup>45</sup>	Acknowledge	–	Grade 1	English	Australia	Aboriginal	Teacher	School
Toohill et al. <sup>48</sup>	Acknowledge	Sample, methodology	3;11–5;0	English (AAE or SAE)	Australia	Aboriginal	Speech pathologist	School
Ugarte et al. <sup>47</sup>	NA	Sample, procedure	4;0–7;11	Spanish	Mexico	Mapuche	Unspecified	Unspecified
Ukrainetz et al. <sup>33</sup>	Team	Methodology	K	English	USA	Arappahoe and Shoshone	Speech pathologist student	School
Washinawatok et al. <sup>40</sup>	Team	Sample	3;2–5;2	English	USA	Native American	Local RA	Multiple
Webb & Williams <sup>8</sup>	Acknowledge	Non-Indigenous, sample	4;0–6;11	English (AAE or SAE)	Australia	Aboriginal	Non-Indigenous speech pathologist	School
Williams & Masterson <sup>38</sup>	Acknowledge	Sample, procedure, methodology	Mean 6;2	English (AAE or SAE)	Australia	Aboriginal	Speech pathologist student	School
Wolgemuth et al. <sup>46</sup>	NA	Methodology	K – grade 1	English (AAE or SAE)	Australia	Aboriginal	Unspecified	School

Abbreviations: AAE, Australian Aboriginal English; FNED, First Nations English Dialect; K, kindergarten; RA, research assistant; SAE, Standard Australian English; TA, teacher's aide; USA, United States of America.

<sup>a</sup>The terminology used mirrors the language employed by authors in their original articles.

by many Indigenous organisations.<sup>1</sup> Indeed, almost half of the studies mentioned the participation of Indigenous team members in preparation, data collection, analysis or writing (44%). Similarly, Indigenous people's participation or support was identified in the acknowledgments in 37% of cases. Only six articles did not mention either the involvement or support from Indigenous communities or individuals.

Concerning limitations, most studies identified limited generalisability due to factors such as small sample size or specific geographic area. Authors also acknowledged limitations associated with (a) assessment procedure, that is biased concepts and non-representative norms; (b) participant demographics, that is missing information; and (c) methodology, that is administration, choice of materials. Notably, certain studies<sup>8,19,20,25</sup> identified the use of non-Indigenous clinicians, even in the presence of Indigenous support personnel, as a specific limitation.

Participant characteristics were used to contextualise the interpretation of results. The number of participants in each study varied widely, ranging from one to over 6000 with participants spanning a large age range. While most articles focused on children aged 4;0–6;11, six articles also included children under 3;11. Notably, half of the participants who spoke the majority Western language of their region were identified as using a dialect, while 22% were bilingual speakers of their traditional language. In the study by Allen and Dench,<sup>26</sup> participants were exclusively monolingual speakers of their language, Inuktitut. Geographically, participants were situated in North American, Circumpolar and Oceanic geographic regions.

Implementation parameters were extracted to provide context. Assessments were primarily administered by speech pathologists, their students or assistants (28%); researchers or their assistants (25%); teachers or their aides (6%); or a combination of these groups (16%). Administrator information was not disclosed in 25% of articles and only 34% detailed the examiners' linguistic or cultural identity. Finally, assessments occurred in diverse settings. Approximately 72% were conducted in one location, typically at the child's school, their home or local building. Four articles offered multiple sites, and five did not specify the assessment location.

### 3.3 | Results of individual sources of evidence

#### 3.3.1 | Assessment procedures

The included studies covered various areas assessed by speech pathologists. Although none focused on preverbal

abilities or fluency; 64% examined oral language, 27% written language, two discussed pragmatics and one addressed speech.

Among the various assessment approaches used, the most common were norm-referenced (41%), criterion-referenced (19%) or alternative (25%), while the remaining contrasted at least two approaches. As can be seen in Table 2, most articles reported assessments conducted in the communities' dominant language, with 85% in Western languages and the rest in a traditional language.<sup>23,26–28</sup> One notable exception was the study involving Kriol speakers from Walmajarri, Australia, where participants were tested on their knowledge of their traditional language.<sup>24</sup>

### 3.4 | Culturally and linguistically relevant assessment features

Authors' recommendations regarding relevant assessment features when working with young Indigenous children were extracted from the discussion sections of the 32 studies. These recommendations encompass using a battery of resources including alternative approaches, ensuring authenticity and cultural relevance, and accounting for a child's linguistic characteristics.

#### 3.4.1 | Battery of resources including alternative approaches

A quarter of authors recommend using a variety of resources in assessments, emphasising a wholistic view of the child and their abilities.<sup>29</sup> To expand upon this, speech pathologists are encouraged to gather input from multiple informants such as parents, teachers and clinicians<sup>19</sup> and assess various communication skills.<sup>24,30–32</sup> Researchers also advocate for incorporating multiple assessment procedures<sup>29,30</sup> sourced from different approaches.<sup>33</sup>

However, not all assessments are deemed culturally and linguistically relevant for use with Indigenous children. Norm-referenced approaches are particularly contentious, with recommendations against the use of tools such as the PPVT<sup>30,34,35</sup> or the CELF-P.<sup>36</sup> For instance, standardised assessments may be biased against Indigenous children as they may be less familiar with the context<sup>35</sup> and language<sup>28,35,36</sup> used in these assessments. This bias is reflected in statistical trends showing that lower socio-economic status and increased rurality, realities lived by many Indigenous children, are associated with lower scores. Some authors, however, suggest their usefulness as part of a battery of tools<sup>29</sup> or when adapted. For example, some studies added an error analysis phase where they further explored the different responses with

**TABLE 2** Results of individual sources of evidence.

<b>Assessment procedures</b>			
<b>Ability</b>	<b>Name</b>	<b>Approach</b>	<b>Test language</b>
Receptive and expressive oral language	LSA	Alternative	English <sup>8,29,36,40</sup> Inuktitut <sup>26</sup>
	Clinical Evaluation of Language Fundamentals – Preschool (CELF-P)	Norm	English <sup>49</sup>
	CELF-P Australian and New Zealand	Norm	English <sup>29</sup>
	CELF-P2	Norm	English <sup>36</sup>
Oral narratives	LSA – story retell	Alternative	English <sup>20,25,34,35</sup>
	Test of Narrative Language (TNL)	Norm	English <sup>42</sup>
Oral vocabulary	Picture selection/naming tasks	Criterion	Walmajarri <sup>24</sup> Samoan <sup>28</sup>
	Renfrew word finding vocabulary test	Norm	English <sup>32</sup>
	Assessing Semantic Skills through Everyday Themes (ASSET)	Alternative, norm	English <sup>33</sup>
	Peabody Picture Vocabulary Test (PPVT)-III	Norm	English <sup>22,30</sup>
	PPVT-IV	Norm	English <sup>30,31,34,35</sup>
	Vocabulary Test in Images Revised	Norm	Spanish <sup>47</sup>
	Anindilyakwa Quality of Phonological Representations	Criterion	Anindilyakwa <sup>23</sup>
Emergent literacy	Phonological awareness	Criterion	Maya, Spanish <sup>27</sup> English <sup>43</sup>
	Non-word repetition	Criterion	English <sup>19</sup>
	Drawing, Writing, Talking Task	Alternative	English <sup>41</sup>
	Performance Indicators in Primary Schools (PIPS) Australian Edition	Norm	English <sup>44</sup>
	PIPS Baseline Assessment	Norm	English <sup>45</sup>
	Queensland University Inventory of Literacy	Norm	English <sup>38</sup>
	Who am I? The grade K	Criterion Norm	English <sup>37</sup> English <sup>46</sup>
Speech	Diagnostic Evaluation of Articulation and Phonology	Norm	English <sup>48</sup>
Language use	LSA	Alternative	English <sup>39</sup>
	Play-based communication assessment	Alternative	English <sup>21</sup>

the child,<sup>22</sup> or avoided the use of normative data<sup>32–34,37,38</sup> or standard scores.<sup>22,31</sup>

Half of the studies emphasised the importance of including alternative assessment approaches in the

battery, asserting that these approaches provide a more accurate and balanced portrait of a child's abilities compared to solely relying on norm-referenced assessments.<sup>27,29,30</sup> The strengths of alternative approaches lie

in their utilisation of naturalistic settings,<sup>8,19</sup> flexibility<sup>34</sup> and the creation of more opportunities to identify a child's strengths.<sup>39</sup> LSA was found to enhance a child's level of engagement<sup>40</sup> within spontaneous<sup>39</sup> and contextualised<sup>21</sup> situations while allowing a dialect informed representative analysis of a child's communication abilities.<sup>8,29,36,40,41</sup> However, caution is advised, as the stimulus may influence the type and quality of language a child produces.<sup>20,21,34,40</sup> For example, story generation, rather than retelling, more accurately represents Kickapoo Nation children's abilities.<sup>42</sup> The inclusion of observation, either to collect a language sample<sup>26</sup> or fill out behaviour checklists,<sup>21,39</sup> was also recommended as it enables views of the child interacting with different people and in various situations.<sup>39</sup> Authors additionally recommended using DA to assess a child's learning ability<sup>43</sup> and to gain an evolving view of their functional abilities.<sup>39,41</sup> Recommended methods included using published DA procedures such as the ASSET,<sup>33</sup> applying dynamic processes to static assessments,<sup>22</sup> or reassessing with the same static assessments to track a child's progress over time.<sup>19,41,43</sup>

### 3.4.2 | Authenticity and cultural relevance

Utilising authentic, culturally relevant, and familiar situations is deemed crucial for gathering language information. Authors<sup>21,39</sup> advocate shifting away from a biomedical health care model to one that highlights an Indigenous child's abilities in terms of what they can do. Speech pathologists are also encouraged to assess the cultural relevance of their materials and their intended usage, as the context in which information is gathered impacts a child's communication by affecting what and how much they share.<sup>40,41</sup> For instance, a child may behave differently during free play compared with formal assessment tasks. Indeed, half of authors encourage authenticity in assessments by using culturally relevant situations such as observing play<sup>8,26,39</sup> or storytelling.<sup>42</sup> They suggest adding more conversational-style comments (e.g. *hmm*) and encouragement in interactions.<sup>22,26</sup> Additionally, they recommend selecting items for assessments that are more culturally neutral such as assessing story complexity<sup>20</sup> rather than grammar or vocabulary<sup>20,35</sup> during narrative assessments.

Authors underscored the significance of ensuring that materials and concepts align with the child's experiences.<sup>22,41,44,45</sup> For instance, prompting rural Māori children to identify a North American word like *canoe* could introduce bias. Conversely, employing *boat* or the Māori word *waka* would help mitigate this bias.<sup>22</sup> However, authors identified the presence of culturally biased concepts

and images in standardised tools such as the PPVT,<sup>22,35</sup> the TNL<sup>42</sup> and the PIPS.<sup>44,45</sup>

Speech pathologists are further advised to take into account the child's familiarity with Western assessment environments,<sup>46</sup> as children exposed to unfamiliar test items have an increased cognitive load to complete the task<sup>46,47</sup> and the child may not be accustomed with less culturally appropriate elements such as direct questioning, which is discouraged in many Aboriginal communities in Australia.<sup>34</sup> Authors suggested strategies to alleviate some of the adverse impacts of unfamiliar contexts such as testing in familiar environments<sup>22</sup> like the child's school or with a trusted person present.<sup>24</sup> Additionally, they recommend allowing observation before executing a novel task,<sup>42</sup> or using DA, which is relatively culturally neutral as it does not rely on prior knowledge.<sup>33</sup>

### 3.4.3 | Child's linguistic characteristics

Linguistic diversity is a crucial consideration given that many individuals in Indigenous communities exhibit language differences. Notably, a child's exposure to a traditional language or dialect at home was found to impact obtained scores for over half of the examined assessments.

Most of the authors underscored the importance of assessing bilingual children in all their languages to distinguish between a language disorder and a difference. Since bilinguals may demonstrate varying abilities across languages,<sup>27,36</sup> assessing them in only one language hinders their ability to showcase their complete linguistic abilities. Authors also cautioned against relying on monolingually-derived norms<sup>28</sup> as bilinguals obtained lower scores when compared to monolingual peers,<sup>26,28</sup> or analysing each language separately.<sup>32</sup> Instead, they recommend using composite test scores, as they offer a more comprehensive view.<sup>27</sup> While dual language testing is recommended, many conventional assessments are only available in majority Western languages. For example, the CELF-P is presently only available in English, French or Spanish. However, there is progress in this area as evidenced by some of the projects in this review that created or adapted existing assessment procedures for specific traditional languages such as Anindilyakwa,<sup>23</sup> Inuktitut<sup>26</sup>; Maya<sup>27</sup>; Samoan<sup>28</sup>; and Walmajarri.<sup>24</sup>

Moreover, a denser use of dialect features increases the likelihood of a child being misidentified with language difficulties by those reporting the child's abilities,<sup>19</sup> and by speech pathologists not using dialect-adapted tools or interpretations.<sup>48</sup> In fact, the level of exposure to the test language or home dialect was found to influence children's results in oral<sup>25,28,36,47,49</sup> and written<sup>38</sup> modalities.

Given that most conventional assessments rely on developmental data obtained from children in urban Western families who use the mainstream dialect, utilising these tools without adaptation adversely affects the scores of non-mainstream dialect speakers due to differences in phonology,<sup>8,48</sup> morphology,<sup>25,47,49</sup> syntax,<sup>20,25</sup> semantics<sup>37,38</sup> and pragmatics.<sup>21</sup> For instance, mean length of utterance is not recommended as an assessment criterion for those speaking Inuktitut-influenced English as the traditional language uses shorter sentences due to the polysynthetic nature of Inuktitut.<sup>26</sup> To address this issue, some authors recommend using dialect-neutral tools such as LSA or DA. However, it is crucial to select and assess dialect-neutral language elements<sup>20,29,35,36</sup> such as story complexity,<sup>20</sup> narrative comprehension and production,<sup>34</sup> or adapting standardised guidelines to accommodate dialect.<sup>48</sup>

## 4 | DISCUSSION

This scoping review has identified three crucial features of culturally and linguistically relevant speech-language assessments for young Indigenous children, aligning with previous publications. These findings hold clinical significance not only for speech pathologists but also for all allied health clinicians working with Indigenous children internationally, as they provide a valuable resource that can be used when culturally and linguistically tailoring assessment plans in all allied health disciplines. Research was gathered from various disciplines for this discussion to obtain a contextualised understanding. Gerlach<sup>7</sup> offers allied-health perspectives from Canada, White and Beagan<sup>5</sup> share an international review of a similar question from occupational therapy, and Armstrong et al.<sup>2</sup> and Zupan et al.<sup>4</sup> provide speech pathology perspectives regarding communication assessments from an Australian lens.

Finally, in a consultation exercise<sup>15</sup> to provide a contextualised perspective, members of Dokis First Nation, an Anishinaabek community in Canada, were asked to provide their interpretations of this information.

### 4.1 | Battery of resources including alternative approaches

One of the elements of a useful battery of resources emphasised by members of Dokis First Nation and mirrored by researchers<sup>2,7</sup> is getting multiple perspectives to provide a more authentic view of the child.

Acknowledging potential biases, Armstrong et al.,<sup>2</sup> Gerlach,<sup>7</sup> White and Beagan<sup>5</sup> and Zupan et al.<sup>4</sup> advise

against the blanket use of standardised assessments with Indigenous children due to potential biases in content and process. Their recommendations for obtaining a more culturally and linguistically relevant assessment snapshot are to adapt assessments to enhance their functionality,<sup>4,5</sup> and to use alternative assessments. For allied health clinicians, this may look like using more informal conversations as opportunities to learn instead of questionnaires<sup>5</sup> and for speech pathologists this can involve LSA, observation and DA as more naturalistic approaches.<sup>4</sup> Members of Dokis First Nation were particularly interested in alternative assessments due to their flexibility to be adapted to different children's realities. For example, they suggest integrating hands-on activities in nature and observing a child in their environment before assessing.

### 4.2 | Authenticity and cultural relevance

Indigenous health care approaches prioritise a wholistic perspective that emphasises balance, and entwined with nature/physical environment.<sup>5</sup> As such, members of Dokis First Nation mirrored concerns not only about the relevance of the assessments themselves but also about the entire process. Gerlach,<sup>7</sup> and White and Beagan<sup>5</sup> reinforce this notion, emphasising that Indigenous individuals are often portrayed in negative ways that perpetuate racist stereotypes exacerbated by the use of deficit-focused Western assessment practices.

Researchers expressed concerns about unadapted assessments continuing to be employed.<sup>2,4,5</sup> As such, it is advisable for clinicians to consider the applicability of the assessment concerning the child's reality and potential sources of observed differences, such as SES,<sup>4</sup> home circumstances, and community and personal well-being.<sup>7</sup> Zupan et al.<sup>4</sup> highlights that Western assessment approaches do not align with the communication styles of many Indigenous people and that authenticity in assessments can be achieved by increasing familiarity which members of Dokis First Nation shared could be done by creating more informal and familiar environments. For instance, storytelling among many Aboriginal and Torres Strait Islanders should be dynamic, interactive and conversational, rather than relying on pictures.

### 4.3 | Child's linguistic characteristics

Finally, although identifying dialect features is relevant for speech pathologists, it also expands to other allied health professions as many linguistic factors can influence an assessment such as the familiarity with the terminology being used, literacy, and culturally differing use

of pragmatic elements such as direct questioning, non-verbal communication.

Armstrong et al.,<sup>2</sup> Gerlach<sup>7</sup> and Zupan et al.<sup>4</sup> emphasise that the home language of many Indigenous families differs significantly from the normalisation samples of most norm-referenced assessments. In turn, members of Dokis First Nation emphasise that clinicians need to learn about local ways of communicating and adapt to them by collaborating with local language speakers.<sup>7</sup> Researchers further advocate for speech pathologists to assess dialect-neutral elements.<sup>4</sup>

In summary, there is collective push from Indigenous families, clinicians and researchers for Indigenous languages, dialects and cultures to be valued, respected and included during strength-based allied health assessments.<sup>2,4,7</sup> From a clinical perspective, this scoping review and the consultation exercise has been used to improve the first author's assessment practices in Dokis First Nation by using approaches that better align with the community values such as introducing observation as an initial element, tapping into the wider community network to learn about the child, and creating more informal spaces for conversation with families.

#### 4.4 | Limitations

This review has noteworthy limitations. First, it exclusively incorporates sources in English or French, potentially overlooking valuable insights from publications in other languages, especially those from Hispanic-speaking countries with significant Indigenous populations. Additionally, the assessment features were categorised by the first author without secondary validation. This review does not extensively explore family interviews,<sup>10</sup> which are crucial in speech-language assessments. Future research could explore the most linguistically and culturally respectful approaches to these interviews. Lastly, it is crucial to acknowledge the immense diversity among Indigenous communities, emphasising the need for clinicians to exercise clinical judgement when applying this information to their clients.

## 5 | CONCLUSIONS

The objective of this scoping review was to identify features of culturally and linguistically relevant speech-language assessment practices with young Indigenous children. Drawing from a range of studies in this domain, the following key features emerged, which are in fact applicable to all allied health professionals: use a battery of resources including alternative assessment approaches; ensure authenticity and cultural relevance of assessment

procedures and practices; and consider the child's linguistic characteristics.

These findings hold clinical significance for allied health clinicians working with Indigenous children globally. They provide a valuable resource of features to consider when culturally and linguistically tailoring assessment plans, as well as a demonstration of how community consultation can contextualise research findings and lead to positive change.

### AUTHOR CONTRIBUTIONS

**Zoe E. Higgins:** Conceptualization; data curation; formal analysis; methodology; investigation; project administration; validation; writing – original draft; writing – review and editing. **Pascal Lefebvre:** Formal analysis; investigation; project administration; supervision; validation; writing – review and editing.

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### CONFLICT OF INTEREST STATEMENT

No conflicts of interest, financial or otherwise, are declared by the authors.

### DATA AVAILABILITY STATEMENT

The data that supports the findings of this study are available in the supplementary material of this article.

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## APPENDIX 1

## SCOPING REVIEW ELIGIBILITY CRITERIA

Criteria	Definition	Inclusion vocabulary	Exclusion vocabulary
Speech and language	Elements of verbal or nonverbal communication that might be examined by a speech-language pathologist in either oral or written formats	<ul style="list-style-type: none"> <li>• Communication</li> <li>• Speech</li> <li>• Language</li> <li>• Literacy</li> <li>• Phonology</li> <li>• Articulation</li> <li>• Fluency/stutter(ing)</li> <li>• Pragmatics</li> <li>• Social communication</li> </ul>	<ul style="list-style-type: none"> <li>• None of the inclusion criteria are mentioned</li> <li>• Communication (when it is part of a title e.g. Communications manager)</li> <li>• Speech (when it is a descriptor e.g. He gave a speech to the audience)</li> </ul>
Assessment	Tools, techniques and approaches used to determine speech or language ability	<ul style="list-style-type: none"> <li>• Assessment of speech or language               <ul style="list-style-type: none"> <li>○ Evaluation</li> <li>○ Test</li> <li>○ Measure</li> <li>○ Tool</li> <li>○ Protocol</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• None of the inclusion criteria are mentioned</li> <li>• Measure (when it indicates a distance, e.g. measure the wall)</li> <li>• Tool (when used to indicate a construction material, e.g. Use the tool to fix the hole)</li> <li>• Only discusses participants identified with a differentiating condition (i.e., a biomedical condition in which a language disorder might be identified as a normal co-occurrence such as autism spectrum disorder, Down syndrome, sensori-neural hearing loss, etc)</li> <li>• Assessment was of language proficiency</li> </ul>
Indigenous Peoples	Self-identified members of Indigenous communities within the following regions: North, South and Central America (e.g., Ojibway, Cree, Mayas, etc.), circumpolar regions (e.g., Inuit), Australia (e.g., Aboriginal and Torres Strait Islanders) and New Zealand (e.g., Māori)	<ul style="list-style-type: none"> <li>• Members of any Indigenous group</li> <li>• Indigenous</li> <li>• First Nation</li> <li>• Aboriginal</li> <li>• Métis</li> <li>• Inuit</li> <li>• American Indian</li> <li>• Native (when used to indicate a person e.g. Native American)</li> </ul>	<ul style="list-style-type: none"> <li>• None of the inclusion criteria are mentioned</li> <li>• Native (when used to indicate a language e.g. native language or to indicate a geographical location e.g. native country, Indigenous land)</li> </ul>
Age	Children aged 0 years to 6 years; 0 months old	<ul style="list-style-type: none"> <li>• Child(ren) – 0–6 years old</li> <li>• Preschool-aged children</li> <li>• Preschoolers</li> <li>• Early Childhood</li> <li>• Kindergarten(ers)/ Kindergarten(ers) (when used to indicate children)</li> <li>• Infant</li> </ul>	<ul style="list-style-type: none"> <li>• None of the inclusion criteria are mentioned</li> <li>• Kindergarden(ers)/ Kindergarten(ers) (when used to indicate a building, structure or room)</li> </ul>

## APPENDIX 2

## DATABASE SEARCH STRINGS

Database	Search syntax	Thesaurus identifier	Thesaurus search syntax
CINAHL	(communication OR speech OR language OR literacy OR phonolo* OR articul* OR fluency OR stutter* OR pragmatic*) AND (assess* OR evaluat* OR test* OR measur* OR task* OR tool* OR protocol* OR diagnos*) AND (indigenous OR “first nation” OR aborigin* OR metis OR inuit OR “american indian*” OR native*) AND (infant* OR preschool* OR “early childhood” OR kindergar*)	CINAHL Subject Headings	((MH “Communication+”) OR (MH “Communicative Disorders+”)) AND ((MH “Speech and Language Assessment+”) OR (MH “Psychological Tests+”)) AND ((MH “Indigenous Peoples+”) OR (MH “Health Services, Indigenous”)) AND (MH “Child, Preschool”)
Cochrane Library	(communication OR speech OR language OR literacy OR phonolo* OR articul* OR fluency OR stutter* OR pragmatic*) AND (assess* OR evaluat* OR test* OR measur* OR task* OR tool* OR protocol* OR diagnos*) AND (indigenous OR “first nation” OR aborigin* OR metis OR inuit OR “american indian*” OR native*) AND (infant* OR preschool* OR “early childhood” OR kindergar*)	MeSH	(MeSH descriptor: [Oceanic Ancestry Group] explode all trees) OR (MeSH descriptor:[ American Native Continental Ancestry Group] explode all trees) OR (MeSH descriptor: [Indigenous Peoples] explode all trees) OR (MeSH descriptor: [Health Services, Indigenous] explode all trees)
Embase	(communication OR speech OR language OR literacy OR phonolo* OR articul* OR fluency OR stutter* OR pragmatic*) AND (assess* OR evaluat* OR test* OR measur* OR task* OR tool* OR protocol* OR diagnos*) AND (indigenous OR “first nation” OR aborigin* OR metis OR inuit OR “american indian*” OR native*) AND (infant* OR preschool* OR “early childhood” OR kindergar*)	Map terms	((exp communication disorder/) OR (exp interpersonal communication/) OR (exp speech disorder/) OR (exp “speech and language”/)) AND ((exp speech analysis/) OR (exp language test/) OR (exp diagnostic procedure/)) AND ((exp indigenous people/) OR (exp Oceanic ancestry group/) OR (exp Na-Dene people/) OR (exp Amerind people/) OR (exp Australian Aborigine/) OR (exp Eskimo-Aleut people/)) AND (exp preschool child/)

## APPENDIX 2 Continued

Database	Search syntax	Thesaurus identifier	Thesaurus search syntax
ERIC	(communication OR speech OR language OR literacy OR phonolo* OR articulat* OR fluency OR stutter* OR pragmatic*) AND (assess* OR evaluat* OR test* OR measur* OR task* OR tool* OR protocol* OR diagnos*) AND (indigenous OR “first nation” OR aborigin* OR metis OR inuit OR “american indian*” OR native*) AND (infant* OR preschool* OR “early childhood” OR kindergar*)	Eric Thesaurus	(DE “Disabilities” OR DE “Communication Disorders” OR DE “Congenital Impairments” OR DE “Developmental Disabilities” OR DE “Intellectual Disability” OR DE “Language Impairments” OR DE “Learning Disabilities” OR DE “Mild Disabilities” OR DE “Multiple Disabilities” OR DE “Physical Disabilities” OR DE “Severe Disabilities” OR DE “Special Health Problems” OR DE “Speech Impairments” OR DE “Language Processing” OR DE “Expressive Language” OR DE “Interference (Language)” OR DE “Naming” OR DE “Reading Processes” OR DE “Receptive Language” OR DE “Language Arts” OR DE “Handwriting” OR DE “Listening” OR DE “Reading” OR DE “Speech” OR DE “Spelling” OR DE “Story Telling” OR DE “Writing (Composition)” OR DE “Phonology” OR DE “Communication (Thought Transfer)” OR DE “Augmentative and Alternative Communication” OR DE “Classroom Communication” OR DE “Computer Mediated Communication” OR DE “Discussion” OR DE “Intercultural Communication” OR DE “Interpersonal Communication” OR DE “Nonverbal Communication” OR DE “Speech Communication” OR DE “Synchronous Communication” OR DE “Verbal Communication”) AND (DE “Young Children” OR DE “Preschool Children” OR DE “Toddlers” OR DE “Kindergarten”)
Google Scholar	“speech-language (therapy OR pathology OR therapist OR pathologist)” AND assessment AND indigenous AND preschool AND communication		

## APPENDIX 2 Continued

Database	Search syntax	Thesaurus identifier	Thesaurus search syntax
ProQuest Dissertations and Theses	(communication OR speech OR language OR literacy OR phonolo* OR articulat* OR fluency OR stutter* OR pragmatic*) AND (assess* OR evaluat* OR test* OR measur* OR task* OR tool* OR protocol* OR diagnos*) AND (indigenous OR “first nation” OR aborigin* OR metis OR inuit OR “american indian*” OR “native american*”) AND (infant* OR preschool* OR “early childhood” OR kindergar*)		
Proquest Nursing and Allied Health	noft((communication OR speech OR language OR literacy OR phonolo* OR articulat* OR fluency OR stutter* OR pragmatic*) AND (assess* OR evaluat* OR test* OR measur* OR task* OR tool* OR protocol* OR diagnos*) AND (indigenous OR “first nation” OR aborigin* OR metis OR inuit OR “american indian*” OR native*) AND (infant* OR preschool* OR “early childhood” OR kindergar*))	ProQuest Thesaurus	MAINSUBJECT.EXACT(“Speech disorders”) OR MAINSUBJECT.EXACT(“Communication”) OR MAINSUBJECT.EXACT(“Language disorders”) OR MAINSUBJECT.EXACT(“Language”) OR MAINSUBJECT.EXACT(“Speech”) OR MAINSUBJECT.EXACT(“Native peoples”)
PsychINFO	(communication OR speech OR language OR literacy OR phonolo* OR articulat* OR fluency OR stutter* OR pragmatic*) AND (assess* OR evaluat* OR test* OR measur* OR task* OR tool* OR protocol* OR diagnos*) AND (indigenous OR “first nation” OR aborigin* OR metis OR inuit OR “american indian*” OR native*) AND (infant* OR preschool* OR “early childhood” OR kindergar*)	ProQuest Thesaurus	(MAINSUBJECT.EXACT.EXPLODE(“Disorders”) OR MAINSUBJECT.EXACT.EXPLODE(“Language”) OR MAINSUBJECT.EXACT.EXPLODE(“Communication”) OR MAINSUBJECT.EXACT.EXPLODE(“Linguistics”)) AND (MAINSUBJECT.EXACT.EXPLODE(“Diagnosis”) OR MAINSUBJECT.EXACT.EXPLODE(“Measurement”)) AND (MAINSUBJECT.EXACT.EXPLODE(“Indigenous Populations”)) AND (MAINSUBJECT.EXACT.EXPLODE(“Preschool Students”) OR MAINSUBJECT.EXACT.EXPLODE(“Kindergarten Students”) OR MAINSUBJECT.EXACT.EXPLODE(“Early Childhood Development”))

## APPENDIX 2 Continued

Database	Search syntax	Thesaurus identifier	Thesaurus search syntax
PubMed	(communication OR speech OR language OR literacy OR phonolo* OR articulat* OR fluency OR stutter* OR pragmatic*) AND (assess* OR evaluat* OR test* OR measur* OR task* OR tool* OR protocol* OR diagnos*) AND (indigenous OR “first nation” OR aborigin* OR metis OR inuit OR “american indian*” OR native*) AND (infant* OR preschool* OR “early childhood” OR kindergar*)	MeSH	((communication[MeSH Terms]) OR (communication disorders/DI[MeSH Terms])) AND ((outcome and process assessment, health care[MeSH Terms]) OR (psychological tests[MeSH Terms])) AND ((indigenous peoples[MeSH Terms]) OR (health services, indigenous[MeSH Terms]) OR (american native continental ancestry group[MeSH Terms]) OR (oceanic ancestry group[MeSH Terms])) AND ((child, preschool[MeSH Terms]) OR (infant[MeSH Terms]))
Theses Canada	(communication OR speech OR language OR literacy OR phonolo* OR articulat* OR fluency OR stutter* OR pragmatic*) AND (assess* OR evaluat* OR test* OR measur* OR task* OR tool* OR protocol* OR diagnos*) AND (indigenous OR “first nation” OR aborigin* OR metis OR inuit OR “american indian*” OR native*) AND (infant* OR preschool* OR “early childhood” OR kindergar*)		
Web of Science	ALL=(communication OR speech OR language OR literacy OR phonolo* OR articulat* OR fluency OR stutter* OR pragmatic*) AND ALL=(assess* OR evaluat* OR test* OR measur* OR task* OR tool* OR protocol* OR diagnos*) AND ALL=(indigenous OR “first nation” OR aborigin* OR metis OR inuit OR “american indian*” OR “native american*”) AND ALL=(infant* OR preschool* OR “early childhood” OR kindergar*)	Web of Science categories	<b>TOPIC:</b> (indigenous OR “first nation” OR aborigin* OR metis OR inuit OR “american indian*” OR “native american*”)