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Communicating care
La communication à cœur

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Dynamic Assessment and Small-Group Play-Based Context Supporting First Nation Children's Standard English Language Development



Évaluation dynamique et jeux en petits groupes comme contextes pour soutenir le développement du langage en anglais standard d'enfants d'une Première Nation

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Abstract

A speech-language pathologist collaborated with a literacy researcher and Indigenous educator in a northern Ontario Indigenous community to develop a clinical approach supporting young children's Standard English language development. The initiative began with the development of a dynamic assessment tool through modifying an existing tool based on input from local Indigenous educators to include more culturally appropriate items. The modified dynamic assessment was administered by the speech-language pathologist using a test-teach-retest process. Children who completed the assessment tasks with support, showing that they required assistance beyond regular classroom activities but not full services, met weekly with the Indigenous educator from their community. During these half-hour sessions, the educator modeled Standard English and engaged children in conversation while children played with toys. This paper reports on analysis of three video-recorded sessions of the play-based sessions. Videos were analyzed in terms of the kinds of educator input that elicited children's multiple-word responses, their use of conventional sentence structures, and use of target grammatical markers (use of plural nouns with s, gender pronouns, and wh-questions), identified through a conversational assessment with the clinician. Results of analysis showed that the three children were more likely to provide multiple-word responses with subjects and predicates when the educator affirmed what they did or said, provided information, and directed their behaviour. A strength of the clinical approach is involving a local Indigenous educator who was familiar with the children's use of their community's First Nations English Dialect, recognizing and recasting children's use of non-standard grammatical patterns.

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Une orthophoniste a collaboré avec une chercheuse dont l'expertise est la littératie et une éducatrice autochtone afin de développer une approche clinique soutenant le développement du langage en anglais standard de jeunes enfants vivant dans une communauté autochtone du nord de l'Ontario. Un outil d'évaluation dynamique a d'abord été élaboré, et ce, en intégrant les commentaires d'éducateurs autochtones provenant de la communauté à un outil existant pour y inclure des éléments plus appropriés au plan culturel. La version modifiée de l'outil d'évaluation dynamique a par la suite été administrée à des enfants par l'orthophoniste à l'aide d'un processus test-enseignement-retest. Les enfants qui ont nécessité un soutien pour effectuer les tâches d'évaluation (ce qui était considéré comme une indication que ceux-ci avaient besoin d'assistance qui allait au-delà des activités normalement effectuées en classe, mais qu'ils n'avaient pas besoin d'une prise en charge complète en orthophonie) ont rencontré l'éducatrice autochtone de leur communauté de façon hebdomadaire. Au cours de ces séances d'une demi-heure, l'éducatrice fournissait des modèles verbaux en anglais standard et engageait la conversation avec les enfants pendant que ceux-ci jouaient avec des jouets. Cet article rapporte les analyses ayant été réalisées sur les énoncés effectués lors de trois rencontres de jeu enregistrées. Les types d'énoncés effectués par l'éducatrice qui ont suscité, chez les enfants, des réponses comprenant plusieurs mots, l'utilisation de structures de phrases conventionnelles et l'utilisation de marqueurs grammaticaux spécifiques (c.-à-d. des noms qui prennent un « s » au pluriel, des pronoms ayant une forme marquée en genre et des mots interrogatifs anglais commençant par « wh- ») ont été analysés. Les marqueurs grammaticaux spécifiques sur lesquels l'éducatrice devait intervenir avaient été préalablement identifiés grâce à une évaluation conversationnelle réalisée par l'orthophoniste. Les résultats ont montré que les trois enfants étaient plus susceptibles de fournir des réponses comprenant plusieurs mots, dont un groupe sujet et un groupe prédicat, lorsque l'éducatrice fournissait des informations additionnelles qui permettaient de définir un concept, gérait le comportement d'un enfant, ou encore, effectuait un commentaire sur ce que faisait ou disait un enfant. Un point fort de l'approche clinique présentée consiste en l'implication d'une éducatrice autochtone qui vivait dans la communauté et qui connaissait bien la façon dont les enfants de la communauté utilisaient l'anglais standard. Cela lui permettait de reconnaître les moments où les enfants des Premières Nations n'utilisaient pas un anglais standard et de reformuler leurs propos.

In this paper, we describe a clinical approach using dynamic assessment to identify First Nation (FN) children who would likely benefit from additional supports for Standard English, followed by a play-based intervention led by an early childhood educator from the FN community. Our approach was designed to address challenges that speech-language pathologists (S-LPs) face in accurately identifying children in FN communities with language difficulties and in providing these children with culturally and linguistically appropriate supports. These challenges arise because of a lack of appropriate tools, limited knowledge about the languages and First Nations English Dialects (FNEDs) used in each community, and the use of ineffective approaches.

Assessment Challenges

The content of the items in assessment tools that have been developed and normed predominantly on children of European-heritage in urban settings may reflect concepts, perspectives, and values that are unfamiliar to northern Indigenous children (Dench, Cleave, Tagak, & Beddard, 2011; Eriks-Brophy, 2014; Peltier, 2011). The assessment approaches may put the children in uncomfortable or upsetting positions (e.g., being expected to provide immediate responses to questions, rather than being allowed the time to respond that is considered appropriate within the children's culture).

Additionally, the language used or expected in the assessments may not reflect the phonological, morphological, and syntactical patterns of the FNED spoken in the children's communities (Ball & Bernhardt, 2008; Bovaird Wawrykow, 2011). Children who are competent language users may provide responses that do not use the expected syntax, speech, or morphological patterns. The FNED in an FN community, situated within sociointeractive patterns of their community and within wider Canadian society, is based on community members' ancestral language and Standard English (Ball, 2007; Bovaird Wawrykow, 2011; Peltier, 2011). Each FNED has variations specific to the language users of the community (e.g., using determiners preceding proper nouns; Flanigan, 1987; Siegel, 2010) and also some similarities to the dialects of other FN communities, such as deletion of auxiliary verbs, pronoun substitution, and forming of *wh*-questions without the subject-auxiliary/modal inversion (Bovaird Wawrykow, 2011).

There may also be a lack of knowledge of the geographic, linguistic, and cultural diversity of FN communities in Canada (Eriks-Brophy, 2014). More than 50 Indigenous languages are spoken in Canada (Cook & Flynn, 2008). Cultural practices, including ways of socializing young

children and learning styles, vary across communities (Eriks-Brophy, 2014). Communication between children and adults is influenced by factors such as "the organization of turn-taking, the role of silence, and the maintenance of appropriate interactional hierarchies" (Eriks-Brophy, 2014, p. 155). Mismatches related to professional attitudes and lack of recognition of the diversity of FN communities lead to inaccurate identification of children's language, challenges in communication between children's parents/caregivers and service providers, and less effective provision of services (Ball, 2007; Peltier, 2011; Zeidler, 2011).

Researchers have found that it is important to get information from local sources when designing assessment instruments (Ball, 2007; Dench et al., 2011; Eriks-Brophy, 2014). Such consultation increases the relevance to children's lives of both the content of items (e.g., themes, objects, and pictures used in the assessment) and the assessment practices that are carried out (Jones & Campbell Nangari, 2008). The development of an Inuktitut and English language screening tool in Nunavut, for example, involved community members from the beginning of the assessment design process to ensure cultural appropriateness in terms of how the assessment approaches were compatible with the community's language socialization practices (Pesco & Crago, 2010). Community members also monitored the accuracy of the use of the Inuktitut language.

Yet, because of time constraints (e.g., communities' budgetary constraints do not allow for the time needed to develop additional/modified assessments), and the small sample sizes, it is not possible for S-LPs to create new assessments for each FN community with which they work. Indeed, strategies used to attempt to reduce the influence of cultural and linguistic biases of standardized assessments on identification of children's speech and language needs include changing item scoring based on knowledge of the children and their community's cultural and linguistic practices or administering only the subtests that are deemed more culturally appropriate. The reliability and validity of results obtained using these practices is also questionable because of the lack of fidelity to the standardized procedures (Eriks-Brophy, 2014). In the following section, we describe studies that have attempted to address issues of designing culturally appropriate assessments.

Dynamic Assessment Approach: Literature Review and Theoretical Approach

Dynamic assessment involves testing to gather information about a child's language or speech, followed by teaching (e.g., providing prompts or models) if the child

is unable to carry out the task, and then retesting within a short period using the same measures to determine if the task is an emerging skill (Fuchs, Compton, Fuchs, Bouton, & Caffrey, 2011; Hasson, Camilleri, Jones, Smith, & Dodd, 2012; Peña, Gillam, & Bedore, 2014). Through these three phases, dynamic assessment allows S-LPs to “differentiate between children who have not yet learned something (e.g., due to limited exposure) from those who, presenting with the same language level, show real difficulty in learning” (Asad, Hand, Fairgray, & Purdy, 2013, p. 322).

Studies examining assessment of Indigenous children's language conducted in the United States (kindergarten: Ukrainetz, Harpell, Walsh, & Coyle, 2000) and in Canada (Grade 3: Kramer, Mallett, Schneider, & Hayward, 2009) show the value of dynamic assessment. In these studies, children who were classified as “normal language learners” or “stronger language learners” benefited to a greater degree from the teaching prompts of the dynamic assessment (principles of categorization and examples) than did those who were deemed to have possible language learning difficulties or were “weaker language learners.” Dynamic assessment is, thus, considered “a promising approach to conducting culturally valid and less biased assessments of Aboriginal children and for reliably identifying children with potential language disorders” (Eriks-Brophy, 2014, p. 163).

Dynamic assessment is underpinned by sociocultural theory (Vygotsky, 1978). Interacting with someone who is more experienced and competent supports children's learning. The Zone of Proximal Development is the “distance between the child's actual developmental level as determined by independent problem solving and the level of potential development” (Vygotsky, 1978, p. 86). In dynamic assessment, if the S-LP's prompts, questioning, or modelling leads to the child's successful completion of the task, the language skill or understanding is within the child's Zone of Proximal Development (Peña, Iglesias, & Lidz, 2001). The amount of assistance that a child needs in the Zone of Proximal Development is an indicator of how close the child is to mastering skills at an independent level (Kramer et al., 2009). When using a dynamic assessment approach, children's learning strategies and responsiveness to adult support

can provide information about how the child learns, as well as the learning process that may need to be targeted in intervention. Thus, it is necessary to determine both the zones of actual and proximal development in order to more fully understand the level of functioning of the child (Peña et al., 2001, p. 151).

Play as a Culturally Relevant Language Intervention

Play provides a forum for exploring and learning language

(Eisazadeh, Rajendram, Portier, & Peterson, 2017; Peterson, Eisazadeh, Rajendram, & Portier, 2018). Through interacting with others using language in play contexts, young children make sense of the objects, actions, situations, and relationships in their world (Bodrova & Leong, 2007; Vygotsky, 1978). In the process, they adopt the social purposes and ways of interacting of their social environment (Barnes, 2008; Boyd & Galda, 2011; Halliday, 1978). Play is culturally relevant because it allows FN children to take up roles that they see in their homes and in their community and provides opportunities for their use of words and expressions that are meaningful within their community (Jacob, Charron, & da Silveira, 2015; Niles, Byers, & Krueger, 2007).

The Zone of Proximal Development is also important when considering the learning potential of play as children can try out and get immediate feedback on emerging understandings about language and language use in a range of social settings (Weitzman & Greenberg, 2002). The social, cognitive, linguistic, emotional, and physical demands of play create motivational and safe supports for children's emerging language skills and understandings (Bodrova & Leong, 2007). Vocabulary development, which is facilitated through repeated exposure and opportunities to use words in meaningful contexts (Biemiller & Boote, 2006; Neuman, 2011), together with social understandings about language use (Myhill, Jones, & Hopper, 2006), are supported in play contexts because children use language while interacting with others in contexts that draw on their funds of knowledge (Hedges, Cullen, & Jordan, 2011).

Method

The clinical approach presented in this paper stems from a collaboration between an S-LP (clinical), an FN early childhood educator, and a university professor in literacy education. Our research was approved by the Human Protocol committee of the University of Toronto (#0029968) and all research practices followed Tri-Council Ethical Guidelines.

The aim of the initiative was to inform the development of culturally appropriate assessments (Ladson-Billings, 1995) that reflect children's home and community cultural knowledge and the development of a follow-up approach for children needing support, but not full speech-language pathology services. The initiative involved a three-step process:

1. Identifying children who might need additional supports by redesigning assessment tasks so they were culturally informed and took a dynamic assessment approach;
2. Providing supports to these children by collaborating

with Kari, an Early Childhood Educator from the children's FN community (please note that names of participants and the community are pseudonyms);

3. Describing the Standard English language abilities of the children.

We assessed the impact of this initiative by analyzing video recordings of the play-based interactions between children and Kari. In our analysis, we identified types of educator input that elicited children's multi-word responses, including responses with Standard English sentence structure of subject and predicate. We also looked for examples of children's use of target grammatical markers that the clinician had identified as needs-based on a conversational language assessment. We begin by describing the process used in efforts to create a more culturally sensitive dynamic assessment and features of the assessment. We then explain how the practice carried out by the S-LP was used to identify participants in the play-based approach and describe the approach.

Creating a Culturally-Responsive Assessment from an Existing Assessment

Team members from the clinician's practice and the university researcher's northern Canadian research project conducted a focus group with four FN educators to learn about the FNEDs and interaction practices between children and adults within their FN communities. The four female educators had a professional relationship with the clinician because of her work in their communities. They had worked as early childhood educators in their FN communities for 10–31 years. In conversations with the clinician while she worked in their communities, the four educators showed a strong awareness of their communities' language and cultural practices. They had also expressed interest in learning more about children's language development. The educators were from four different FN communities, including the community that became the focus of our study, Sinence Shores First Nation, located in an Oji-Cree community in northern Ontario. Four questions were discussed in the focus group:

1. At what age do educators expect specific English language structures (e.g., gendered pronouns, regular plurals, prepositions) to be present in the oral language of children from their community? Were the language structures we were interested in important to them?
2. What vocabulary items do educators deem to be culturally appropriate? At what age do they expect children in their community to use them?
3. How do they gather information about the children's learning?

4. What culturally appropriate activities could be incorporated into the speech and language assessments used by the clinician?

Based on the four Indigenous educators' focus group contributions, the S-LP and her team modified the vocabulary learning and expressive language portions of the Dynamic Assessment of Preschoolers' Proficiency in Learning English (DAPPLE). With these changes, children could demonstrate their morpho-syntactic knowledge in the expressive language portion using topics that were relevant to their experience.

The clinician chose the DAPPLE assessment, which was developed to distinguish language deficits from difference due to children's bilingual learning contexts (Hasson et al., 2012). Empirical research evaluating the effectiveness of the DAPPLE in differentiating between language difference and language disorder showed that bilingual children who were on an S-LP's caseload required a greater amount of prompting than did bilingual children in a control group on receptive vocabulary and sentence structure tasks (Hasson et al., 2012). Additionally, the clinician had found the assessment helpful in distinguishing difference due to FN children's FNED and individual children's core language difficulties in previous years working with young FN children.

Based on recommendations from focus group participants, the items on the vocabulary portion were substituted to make the assessment culturally relevant. As an example of a modification, the word *soap* was excluded because the community members felt it was not a word used by children 3–5 years of age. The words *hot* (in relation to fire) and *moose* were added. The stimulus pictures for the expressive language portion were modified to include familiar activities such as riding a bike and eating ice cream. The evaluation tool was implemented in a setting where children interacted with toys to allow children to feel more comfortable and to generate more naturalistic language. Additionally, prompts for the expressive tasks were developed as part of the dynamic assessment process. The DAPPLE assessment was no longer standardized because of all the modifications, so the norms provided could not be used. The dynamic assessment feature of the modified DAPPLE did inform the clinician's recommendations for either full S-LP services or participation work with Kari on the play-based intervention.

The dynamic assessment process was used when children were unable to produce the target vocabulary or sentence structure independently on the vocabulary or expressive language tasks. What the child was able to do during the posttest phase provided the clinician with

information about the child’s language learning abilities. For example, to assess the child’s ability to produce a subject-verb-object sentence structure, which is a sentence structure used within the FNED of that community, as explained by FN educators who participated in the focus group, the clinician modelled a sentence of that format to describe a picture (e.g., The **boy** is **riding** a **bike**). The child was then asked to describe two pictures and responses were recorded; these trials formed the pretest phase. In the teaching phase, the child was shown six additional pictures. If the child omitted a portion of the sentence (e.g., said “catching the ball” for “The **girl** is catching the ball”), a hierarchy of prompts were provided by the S-LP to assist the child in generating the subject-verb-object sentence structure. If the child was unable to formulate the subject-verb-object sentence, a model was provided for the child to imitate. Following the teaching phase, a short break was taken in which the child was asked to do a non-verbal task. After the break, in the posttest phase, the child was shown two pictures and asked to describe what was happening. No further prompts were provided. Sample prompts can be found in **Table 1**.

The children’s responses during the teaching and posttest phases indicated their ability to respond to learning experiences (e.g., how they approach learning tasks and difficulties they encounter), rather than their static level of achievement at the time that a standardized assessment is conducted (Hasson & Joffe, 2007). As such, this information was used to distinguish children who require additional exposure and support in their everyday environment from children requiring specialist intervention. Children

identified as needing additional exposure were placed in the play-based language stimulation group to work with Kari. It was hoped that with exposure to consistent and focused language models, the children would acquire Standard English grammatical markers.

Context and Participating Early Childhood Educator and Children

Our clinical approach took place in the ancestral territory of Oji-Cree FN communities affiliated with the Nishnawbe Aski Nation, a provincial and territorial organization representing 49 First Nations in northern Ontario, Canada. We are grateful for the opportunity to work with community members of Sinence Shores First Nation within this territory. At the request of school leadership of Sinence Shores Elementary School, the clinician administered the version of the DAPPLE assessment tool that had vocabulary changes in accordance with focus group recommendations and included dynamic assessment prompts, with all children aged 3–4 years who were in the first year of kindergarten in November 2016.

Approximately 450 kilometers from the nearest urban centre and accessible only by plane or by winter roads when the lakes freeze over, Sinence Shores First Nation is a northern Ontario FN community with a population of approximately 3000 people. For the past 10 years, the clinician and her colleagues have provided speech and language services to the community. Treatment is primarily provided during individual and small group sessions led by an S-LP or communicative disorders assistant, with support from the participating educator, Kari. A member of

Table 1	
Examples of the Dynamic Assessment Prompting Hierarchy for the Expressive Language Section of the DAPPLE	
Target: The girl is catching the ball	
Child’s response	Prompt provided by clinician
“Girl catching ball”	This was considered the desired subject-verb-object response but the clinician would recast the utterances using articles and auxiliary “is” - “Yes, the girl is catching the ball”
“Catching the ball”	“Who is catching the ball?” [girl] “Tell me it all together” [girl catching ball]
If the student could not reproduce the sentence using the subject-verb-object, the clinician would model the full sentence for the child to imitate	“Tell me ‘the girl is catching the ball’”
If the child could not imitate the full sentence, the clinician would model each component for the child to imitate	“Tell me the girl [the girl]...is catching [is catching]...the ball”

Note. DAPPLE is the Dynamic Assessment of Preschoolers’ Proficiency in Learning English.

Sinence Shores First Nation, Kari has worked as a teaching assistant for 7 years and then as a full-time speech-language pathology classroom assistant for 3 years in her community's elementary school.

Although there were six children in Kari's class, three children who attended more regularly are included in our study. These include one girl, Ava, and two boys, Chase and Raiden. These three children demonstrated language learning within the dynamic assessment task and had no presumed developmental language disorder, but showed that they would benefit from increased language exposure to acquire additional Standard English grammatical markers, as requested by the school leadership. They were exposed to some Ojji-Cree in the home, though English is the primary language used within the community and in school. Ava and Raiden were in the Ojji-Cree Immersion kindergarten class and Chase was in the English kindergarten class. The elementary school has a population of approximately 350 students in K4 (children enter during the year in which they turn 4 years old) to Grade 6.

Determining Language Goals for Children Working with Kari

To determine language goals for each child that had been recommended to work with Kari, the clinician conducted a conversational assessment. She invited the children to talk about toy objects and photographs in order to elicit grammatical structures, such as prepositions, plural nouns, and subject and object gendered pronouns. The chosen toys and photographs reflected the topics that the four educators identified in focus group conversations as familiar to the children. If children did not comment on their environment, the clinician asked questions such as "What do you see on the table?" to provide additional opportunities for the child to use the target grammatical structures. Those structures that children did not use or used incorrectly became the goals for each child. The clinician drew on her knowledge of Sinence Shores' FNED when setting goals, aware that some of the children's grammatical structures reflected their community's ways with words (Bovaird Wawrykow, 2011). The Sinence Shores' FNED has variations specific to the language users of Sinence Shores First Nation (e.g., using determiners preceding proper nouns). The clinician repeated this procedure at the end of the year to determine if children had achieved the goals. If the children used the structures at least three times correctly in the prompted conversation, the clinician assessed the goal as being met. If the children used the structure once correctly, the clinician assessed the goal as being partly met/the target grammatical structure was emerging.

Play-Based Approach

The play-based approach is based on a view of play as a context for children's language development and overall learning (Hirsh-Pasek, Golinkoff, Berk, & Singer, 2009; Wood, 2013). Characteristics that appear frequently in definitions of play include space for creativity (e.g., creating imaginary roles and contexts and assigning new meanings/roles to objects), as well as high levels of engagement, exploration of objects, problem-solving, and relational activity (Moyles, 2013; Wood, 2010). These characteristics were considered when Kari planned the play-based intervention.

Kari implemented the play-based intervention weekly across 10 weeks. The clinician gave Kari the Standard English grammatical marker goals for each child based on the conversational assessments. She asked Kari to provide exposure to one grammatical marker (e.g., either gendered pronouns, prepositions, plural s) each week to make it easier for her to plan. Kari could focus on one marker as she planned play activities with available toys and construction materials. Kari was asked to engage the children in play, emphasizing the grammatical marker in her sentences and recasting or rephrasing their sentences as needed (e.g., if the child said "him running" she rephrased/recast what was said, "Yes, he is running"). This *conversational recast* method involved repeating "some or all of the child's words and add[ing] new information while maintaining the basic meaning expressed by the child" (Cleave, Becker, Curran, Owen Van Horne, & Fey, 2015, p. 237). The recasting provided a model of a way to express the child's meaning in Standard English (Cleave et al., 2015; Edwards & Rosin, 2016), while not giving the child the impression that the community's FNED is "wrong" (Wheeler & Swords, 2004).

In the sessions, the children interacted with play materials while Kari asked questions and prompted language related to the play. At the beginning of each play session, Kari brought out play materials and placed them in front of the children who were seated at the table. While the children engaged in free play, they talked informally to Kari and to one another. Kari also encouraged the use of specific grammatical markers (e.g., plural nouns, gendered subject pronouns) by asking questions about what they or their peers were doing and about the children's lives, as shown in the findings section.

Methods for Interpreting Video-Recordings of Play-Based Interactions

On three occasions in the middle of the intervention period, Kari set up an iPod on a tripod in her speech-language support room so that it captured the activity and language of the three children as they interacted with

play materials, each other, and with her. At this point, Kari had had a few weeks to apply what she had learned from the clinician about play-based support of the children's language. The video-recording did not continue beyond this period because of the irregularity of children's attendance. The videos were each approximately 25 minutes in length, as Kari recorded the entire session with children. The videos were transcribed using the *Jeffersonian Transcription System* (<http://mis.ucd.ie/wiki/JeffersonianTranscription>) with a description of Kari's and each child's language and actions. **Table 2** summarizes the play context in each of the recorded sessions, which were taken over a period of 3 weeks.

The unit of analysis was an utterance, which we defined as a spoken word, statement, or vocal sound with a single purpose. We analyzed 242 utterances of the focus children and 238 utterances of Kari within the three videos. To begin the process, we identified participating children's use of two target Standard English language structures (e.g., regular plurals and third-person subject and object pronouns). We

tallied the frequency of children's conventional and non-conventional use of the markers.

We then described the function of each of Kari's utterances. For instance, when she said things like, "[That's] how you go home when you go home after school, right?," we described the purpose of such utterances as providing or seeking affirmation. In this phase of our analysis, we developed seven codes describing the function of Kari's utterances. **Table 3** provides a detailed description of each of these functions with examples of each. We called these "educator prompt" codes. We calculated frequencies of the educator prompt codes and identified whether each type of prompt elicited a one-word response (e.g., saying "yellow" after being asked to identify the colour of an object) or multiple-word responses. We determined the mean length of utterance of each multiple-word response and identified multiple-word utterances that included Standard English subject-predicate structures (e.g., "I want to put this right here"). We also determined which educator prompts elicited expected use of the two target grammatical markers.

Table 2		
Context of Analyzed Videos		
Video title	Focus children	Play materials
Connect Four™	Chase and Ava	Connect Four™ game, a toy bridge, a pool, a box, a lily pad, toy animals, and a car
Play with PlayDoh™	Raiden, Chase, and Ava	Clay and toy animals
Play with Animals	Raiden, Chase, and Ava	Toy animals, paint, and PlayDoh™

Table 3	
Educator Prompt Codes with Examples	
Educator prompt codes	Examples
Asking a question about children's lives	Kari: Where do you sleep?
Asking a question about play context	Kari: What kind of animals are those?
Providing and seeking affirmation	Kari: Yes, we can play with the frogs Kari: Okay?
Asking for clarification of child's utterance	Kari: Hmm?
Directing children's behaviour	Kari: Sit down
Giving information	Kari: It's called a pilot
Asking/encouraging children to provide examples of the target grammatical structures	Kari: This is a...?

Results

We report our analysis of the types of input provided by Kari that elicited three children's use of one-word and multiple-word utterances, utterances that included subjects and predicates, and the mean length of multiple-word utterances.

Educator Prompts and Children's Responses in Play-Based Context

As shown in **Table 4**, Kari's most frequent prompts were for the purpose of asking questions about children's lives and about the play context. These prompts did not elicit the greatest percentage of multiple-word responses, however. Children's multiple-word responses, whether they included both a subject and predicate or not, were usually 3–4 words in length.

We provide examples of Kari's prompts and children's responses, beginning with Kari's prompts that elicited the greatest percentages of children's multiple-word responses—those with the purposes of providing or seeking affirmation, giving information, and directing children's behaviour.

When Kari provided or sought affirmation, the children almost always expanded on what they or others had previously said using multiple-word utterances for the purpose of explaining or expressing a need. For example, Kari explained to the children at the end of one of the play

sessions, "You guys can come play with the Play-doh™ again when you guys come [back] in, okay?" Chase replied, "I played with frogs when I was . . ." but then stopped his sentence. After Kari provided affirmation, "Yes, we can play with frogs," Chase asked, "When we come back?" Kari provided Chase with affirmation once again saying, "mmhm." Chase then exclaimed, "We're gonna play with frogs!" Many of the children's multiple-word responses used a subject and a predicate using FNED or Standard English. For example, in an exchange while children and Kari played with PlayDoh™, Kari repeated, "Pizza" after Raiden had said his favourite food was pizza. Following Kari's affirmation, Raiden used the theme of his favourite things to say, "And my favourite game is the Minecraft™." In some cases, children's responses to Kari's affirmations involved disagreeing with what had been said. For example, Chase's response to Kari's question, "Who swims in ponds?" was "Frogs." After Kari affirmed by saying, "Frogs," Ava corrected them, giving her version of where frogs swim: "No, frogs swim in the lake."

Though there were few instances when Kari gave information about a concept or phenomenon related to the play context or to children's lives, the children almost always responded with more than one word and often used short sentences (mean length of utterance of 3.8). For example, Kari explained a process of using primary colours to create secondary colours while children were playing with PlayDoh™: "See, when you mix blue and yellow, it turns into

Table 4

Purposes of Kari's Utterances and Lengths/Conventional Sentence Structure of Elicited Verbal Responses from Children

Purposes of Kari's utterances (<i>n</i> = 238 utterances)	Children's utterances (<i>n</i> = 242 utterances)		
	% of One-word responses	% of Multiple words (mean length of utterance in number of words)	% of Multiple- word responses with subject and predicate
Providing and seeking affirmation (<i>n</i> = 38)	5.3	94.7 (4.3)	63.2
Giving information (<i>n</i> = 6)	10.0	90.0 (3.8)	81.8
Directing children's behaviour (<i>n</i> = 13)	15.4	84.6 (4.5)	61.5
Asking questions about children's lives (<i>n</i> = 92)	38.0	62.0 (3.7)	26.0
Asking questions about play context (<i>n</i> = 89)	48.3	51.7 (3.9)	23.6

green!" Chase's response, for the purpose of expressing a need, included a subject and a predicate: "I need blue." Kari also provided information by defining concepts. For example, she explained, "Breakfast is what you eat in the morning. When you get up, when you eat, that's breakfast." Raiden responded by repeating information about breakfast that was salient to him, using a phrasal verb: "When you get up."

When Kari directed children's behaviour, children responded most frequently with conventional sentences. The social needs of the situation seemed to create a need for longer responses (mean length of utterance = 4.5), as children's responses usually were for the purpose of justifying their own or other children's actions. For example, when Kari directed Chase to "Stay there," rather than going toward the door, Ava provided a rationale for Chase's actions with a complete sentence: "He's just going to shut the door." Similarly, when Kari directed, "Come on, Raiden! You've got to help me," Raiden replied, "I don't want my hands in there," giving a rationale for why he was not helping Kari tidy up the PlayDoh™.

Although they were Kari's most frequently used prompts, asking children questions about the play context or about children's lives frequently elicited children's one-word responses or multiple-word responses that were not complete sentences. The questions Kari asked in the play context were often closed-ended, such as "What colour is the other?", to which Ava responded "Yellow." Questions about children's real lives often elicited multiple-word responses in the form of Wh-complements (with elision) or predicates. For example, when Kari asked, "When do you go to school?", Raiden replied, "When the bus comes." To Kari's question, "Did you go sliding at all this year?", Chase replied, "Yeah, go on the big big hill." As shown in previous research where elision in response to questions was common (e.g., Johnston, Miller, Curtiss, & Tallal, 1993), the use of full sentences was not required in order for children to provide the information requested in Kari's question.

Children's Use of Target Grammatical Markers

In the play-based context. In the ongoing conversations with Kari and with each other while playing with toys and PlayDoh™, the three children used Standard English plural noun forms in 100% of obligatory contexts for use of plural nouns. For example, when Kari explained that one of the play sessions was coming to an end, Raiden said, "Wait, I will put my colours down first." In another play session, Chase gestured toward a toy box on the table, exclaiming, "I need my Ninja Turtles in there!"

The children did not use gendered pronouns in the

three play-based sessions except in response to Kari's questions: "Would you say your mommy is a she or a he?" and "Is your daddy a she or a he?" Ava and Chase answered the questions with the correct subject pronoun. The play-based contexts did not appear to provide opportunities for children to use third-person subject and object pronouns in ongoing conversation with peers and with Kari.

End-of-year sentence completion probes in conversation with clinician. In an assessment conversation where they completed sentence probes about pictures and videos with the clinician at the end of the school year, all three children used regular plurals. Their use of third-person gendered subject and object pronouns was not consistent, however. This difficulty in acquiring the use of third person pronouns was a language pattern that the clinician found to be true for many children in Sience Shores Elementary School. This observation has been reported by Peltier (2011) and described by the four educators who participated in the focus group informing the development of the culturally sensitive assessment, as reflective of the absence of gender terms in the Indigenous language.

Discussion

Dynamic Assessment Practices

We acknowledge the conflict of interest inherent in an S-LP reporting on a clinical approach that she has carried out, but feel that the collaboration with university researchers to analyze video recordings of the intervention helps to mitigate the effects of this conflict. Additionally, because of the limitations of a very small sample size, lack of a control group of children who performed in a similar manner on the dynamic assessment modifications that the clinician made to the DAPPLE assessment, and our inability to confirm that results of the dynamic assessment accurately identified whether each of the three children's use of language was the result of using their community's FNED, we cannot authoritatively assert the efficacy of the dynamic assessment. We also recognize that the practice for determining achievement of target language structures (the structures were used three times in a prompted conversation with the clinician) does not set a high standard allowing us to claim with confidence that goals have been achieved.

With these limitations in mind, we propose that the dynamic assessment shows potential as a tool for identifying children who can benefit from increased exposure to specific Standard English language forms in a play-based setting, such as that collaboratively created by Kari and the clinician. This potential requires long-term follow-up with participating children to confirm that their

language reflects the FNED of their community rather than a developmental language disorder. Our findings are consistent with those of other studies of dynamic assessments of children's language (e.g., Asad et al., 2013) and indicate that further research to determine the assessment's usefulness across a larger population is warranted. Such research must begin with a recognition of the sociocultural and linguistic diversity and unique FNED from community to community. FNEDs are evident in the home and community talk of Indigenous peoples living on a FN territory, as well as those residing in rural or urban contexts (Peltier, 2011). We propose that the model for modifying existing assessments that is presented in this paper could be applied across many FN contexts, as well as urban and rural early learning contexts with FN children.

Additionally, although modifications to the assessment tool were based on focus group data from four FN educators (including Kari), the design of our research study does not allow us to make authoritative claims of cultural appropriateness of the dynamic assessment. In many respects, our practice is another example of what Peltier (2011) called "mak[ing] do with existing assessment and intervention tools that are available" (p. 133), as we have simply tinkered with the existing tool. In agreement with Peltier, we believe it is necessary for S-LPs to conduct further research to develop assessment tools and approaches that are culturally appropriate for Indigenous children. The need for approaches that address this issue is underscored in survey results revealing that the largest proportion of diagnoses of children's special needs in 59 Aboriginal early learning and child care centres are speech-language related (de Leeuw, Fiske, & Greenwood, 2002).

Play-Based Language Stimulation with Local FN Educator

Our clinical approach involved the use of a play-based language stimulation group for Indigenous children who demonstrated language learning potential using a dynamic assessment protocol. There, they met weekly with Kari, an Indigenous educator from their community, to engage in play-based activities. As our findings show, the interactions with each other, with Kari, and with play materials in the play-based language stimulation group created authentic communicative situations for children to use language for purposes such as explaining their own and others' actions, communicating needs, elaborating on their own or others' responses to questions, and asking questions. They engaged in "real talk" to carry out intentions and fulfill needs (Boyd & Galda, 2011; Halliday, 1978).

When using language, participating children drew on familiar perspectives and ways of interacting. The play interactions with both peers and Kari provided a

safe and motivational context for children's language development (Bodrova & Leong, 2007). They were in the company of other children and Kari, all who were from their community and with whom they had established, comfortable relationships. In these respects, the play-based small group setting was culturally appropriate for supporting the children's language (Eriks-Brophy, 2014). The children participating in our study used the target language structure of plural nouns when contributing to the small-group conversation in the various play settings, using plural nouns to communicate their needs and wants. They also demonstrated increased understanding and use of these target language forms in postintervention assessments.

Increased exposure to the Standard English forms, through Kari's recasting of children's uses of non-standard grammatical patterns (Edwards & Rosin, 2016) in weekly play-based sessions, appears to have supported children's use of this target language structure. Prompts that elicited longer and more diverse utterances were for the purposes of providing or seeking affirmation, giving information, and directing children's behaviour. Kari, an adult from their community, asked questions inviting children to talk about what they knew and had experienced, and affirmed what they were saying. Because Kari also lived in the community and knew the children's families, her questions and follow-up affirmations and extensions reflected the community's culture and ways of interacting, providing children with opportunities to co-construct cultural knowledge and identities as competent members of their community (Cekaite, Blum-Kulka, Grøver, & Teubal, 2014). She also was aware of the children's use of FNED in the grammatical patterns used in their responses to questions and contributions to the small group conversation.

The children did not, however, use gendered subject and object pronouns in their play-based interactions and they did not show mastery in their use of gendered pronouns in the year-end assessment with the clinician. In the future, we plan to introduce storytelling in the play-based context. Following Kari's storytelling using dolls that she identifies as female and male as props, she will invite children's storytelling using third-person gendered subject and object pronouns. Storytelling is also a culturally appropriate context for children's language use, as it is important within oral traditions of Indigenous cultures in Canada and around the world (Archibald, 2008; Barrett & Cocq, 2019; Fitznor, 2019).

We recognize that the limited sample and data set (with only a 3-week period during which interactions were video-recorded and a 10-week intervention period in total) do not allow us to claim with great confidence that children's

language changed as a result of the play-based intervention. Recommendations by Cleave et al. (2015) conducting a systematic review and meta-analysis of research on recasts in language intervention are pertinent to our research study. Further pre-intervention and post-intervention measures with ongoing data collection over a longer intervention period, together with a more systematically-developed and documented protocol for training the FN S-LP assistant, are needed to provide reliable and valid evidence of the outcomes of the recast interventions such as the one we have reported in this paper.

In conclusion, we propose that modifying existing assessments, such as the DAPPLE, to include dynamic assessment practices and vocabulary based on input from local Indigenous educators, has potential to provide S-LPs with useful information for identifying children who may benefit from play-based interventions and not require full S-LP services. These assessment practices, together with play-based small group interactions guided by a local FN assistant who collaborates with an S-LP, have potential to offer a viable framework for culturally sensitive speech and language services for young FN children. Our experience underscores the need to develop long-term relationships between FN community S-LP assistants and clinicians who support their work with children in their community. Since conducting this research, the clinician has been providing ongoing training and mentoring, a process that we recommend to strengthen the effectiveness of the intervention. Although further research with additional controls is needed, we suggest that clinicians could consider these clinical approaches for culturally sensitive assessments and language stimulation in collaboration with FN community members.

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Étude pilote : accès lexical en contexte de narration chez des enfants unilingues francophones d'âge scolaire



School-Aged French-Speaking Children's Word Finding in Narration: A Pilot Study

MOTS-CLÉS

ACCÈS LEXICAL

MANQUE DU MOT

NARRATION

ÉVALUATION

DISCOURS

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Au cours des dernières années, les recherches sur l'identification de difficultés d'accès lexical se sont principalement intéressées à la dénomination, délaissant le discours et le lien entre ces deux tâches, surtout pour les enfants francophones. L'absence de données sur les caractéristiques d'accès lexical attendues en discours chez les enfants francophones, telles que les pauses et les interjections, rend l'identification de difficultés d'accès lexical complexe pour les orthophonistes. Cette étude pilote visait (1) à recueillir des données préliminaires sur la fréquence des caractéristiques d'accès lexical en narration et (2) à déterminer s'il existe une relation entre cette variable et les résultats à une tâche de dénomination. Onze enfants unilingues francophones qui avaient un développement typique ($M = 7;07$ ans, $ÉT = 0;10$ ans) ont participé à deux tâches de narration, ainsi qu'à des tâches de dénomination et de désignation. Les participants ont généré une narration à partir d'une histoire à compléter, puis à partir d'une image tirée du *Test of Narrative Language* (Gillam et Pearson, 2004). L'analyse de German, tirée du *Test of Word Finding in Discourse* (1991), a été appliquée aux échantillons de langage en contexte narratif afin de récolter des données préliminaires. Les résultats suggèrent que l'utilisation des données normatives du *Test of Word Finding in Discourse* pour la population franco-québécoise est problématique en contexte de narration. De plus, aucune corrélation significative n'a été observée entre la dénomination et les caractéristiques d'accès lexical en narration, suggérant que l'analyse du *Test of Word Finding in Discourse* pourrait devoir être adaptée pour la narration. D'autres études sont en cours auprès d'un échantillon de plus grande taille et comprenant des enfants présentant des difficultés d'accès lexical afin de déterminer l'utilité en clinique et en recherche du contexte de narration dans l'évaluation de l'accès lexical.

Abstract

For the past few years, research on word-finding difficulties has focused on picture naming, while word finding in discourse and the link between these two tasks has been neglected, especially for French-speaking children. Thus, speech-language pathologists working in French cannot rely on the frequency of word-finding behaviours, such as delays and repetitions, to correctly identify word-finding difficulties in discourse. This pilot study aimed to (a) collect preliminary data on the frequency of word-finding behaviours in discourse and (b) determine if a relationship exists between the frequency of word-finding behaviours in discourse and picture naming task scores. Eleven typically developing French-speaking children ($M = 7;07$ years, $SD = 0;10$ years) told two stories and completed picture naming and word-picture matching tasks. The first story was produced following a story stem and the second from a picture from the Test of Narrative Language (Gillam & Pearson, 2004). To collect preliminary data, we used German's analysis from the Test of Word Finding in Discourse (1991) to analyze the children's language sample. Results suggest that using normative data from the Test of Word Finding in Discourse is problematic when assessing French-speaking children in narration. Moreover, picture naming and the frequency of word-finding characteristics in narration did not correlate significantly, suggesting that modifications to the Test of Word Finding in Discourse analysis may be needed for narration. We are conducting further studies with a larger sample including children with word-finding difficulties to determine the clinical and research utility of narration as part of a speech-language pathologist's assessment of word finding.

German, Schwanke et Ravid (2012) utilisent le terme *difficultés d'accès lexical* (*word-finding difficulties*) pour faire référence à une difficulté à accéder à des mots connus pour s'exprimer au quotidien. Cette problématique développementale, qui est au cœur de la pratique des orthophonistes, occasionne des difficultés sur le plan de la communication. Les difficultés d'accès lexical peuvent rendre la communication d'un locuteur lente et imprécise, à tel point qu'il arrive que l'interlocuteur parle à la place du locuteur (Best et al., 2018). Sur le plan émotionnel, les difficultés d'accès lexical peuvent engendrer de la frustration et une baisse de l'estime de soi (Best et al., 2018; German et al., 2012). Sur le plan académique, les difficultés d'accès lexical constituent un obstacle dans toute tâche nécessitant l'accès à des mots, comme répondre à des questions, raconter un événement (German, 2015), apprendre du nouveau vocabulaire (German et al., 2012) et lire à voix haute (German et Newman, 2007). Au sein du Canada francophone, aucune publication scientifique ne s'est intéressée à cette problématique, causant des divergences terminologiques chez les orthophonistes. De l'autre côté de l'Atlantique, c'est le terme *manque du mot* qui prime (Bogliotti, 2012; Bragard et Schelstraete, 2008). Au Québec, deux termes sont fréquemment utilisés par les orthophonistes, soit *difficultés d'accès lexical* et *trouble d'accès lexical*. Il semblerait qu'aucune réflexion n'ait eu lieu sur la terminologie francophone la plus appropriée pour parler de ces difficultés, puisqu'une nuance importante existe entre les termes répertoriés. En effet, le terme *trouble d'accès lexical* fait référence à un trouble distinct pouvant exister seul, tandis que le terme *difficultés d'accès lexical* peut faire référence à des difficultés qui s'inscrivent (ou non) dans une problématique plus large, telle qu'un trouble développemental du langage. D'un autre côté, le terme *difficultés* pourrait laisser croire qu'il s'agit d'une problématique temporaire, alors que les difficultés d'accès lexical sont persistantes (Messer et Dockrell, 2013). N'ayant actuellement pas de réponse à cette question terminologique, nous emploierons la traduction littérale du terme *word-finding difficulties*, soit *difficultés d'accès lexical*.

Peu importe la terminologie employée dans la littérature, force est de constater qu'il existe peu de recherches en orthophonie portant sur l'accès lexical (Best et al., 2018), surtout auprès des enfants francophones (Bragard, Schelstraete, Collette et Grégoire, 2010). De ce fait, la cause des difficultés d'accès lexical est actuellement inconnue, mais les principaux suspects sont la qualité des représentations sémantiques ou phonologiques et l'accès à ces représentations (Leonard, 2014; Messer et Dockrell, 2006). En ce sens, l'accès *per se* aux représentations sémantiques et phonologiques des mots pourrait être

problématique. Leonard (2014) avance aussi que la qualité des représentations sémantiques ou phonologiques pourrait être en cause. En effet, des représentations imprécises, peu développées et bénéficiant de peu d'associations entre elles pourraient nuire à la récupération du mot. D'autres auteurs ajoutent que la cause des difficultés d'accès lexical pourrait être différente d'un enfant à l'autre (Bragard, Schelstraete, Snyers et James, 2012; Ebbels et al., 2012; Friedmann, Biran et Dotan, 2013) et pourrait différer notamment selon les autres problématiques vécues par l'enfant (German, 2015). Par exemple, le trouble développemental du langage peut être associé à des représentations sémantiques (McGregor, Oleson, Bahnsen et Duff, 2013) et phonologiques imprécises (Bishop, Snowling, Thompson, Greenhalgh et the CATALISE-2 consortium, 2017). La qualité de ces représentations pourrait être à l'origine des difficultés d'accès lexical vécues par certains enfants ayant un trouble développemental du langage (German, 2015). Suivant cette logique, la qualité des représentations phonologiques pourrait également contribuer aux difficultés d'accès lexical vécues par certains enfants présentant un trouble développemental des sons de la parole. Au contraire, la qualité des représentations sémantiques ou phonologiques ne serait pas la cause des difficultés d'accès lexical chez les enfants présentant une dyslexie (German, 2015). Ce serait plutôt le mécanisme d'accès, soit la recherche de mot, qui serait déficitaire chez cette population (German, 2015). Il n'est toutefois pas connu pourquoi seule une partie de ces populations présente des difficultés d'accès lexical.

Les manifestations des difficultés d'accès lexical, mieux connues des chercheurs, sont les pauses, les interjections (p. ex. « euh, euhm »), les substitutions sémantiques ou phonologiques, les commentaires métalinguistiques (p. ex. le mot commence par le son « p ») ou métacognitifs (p. ex. « je connais le mot »), les répétitions et les révisions (Best et al., 2015; Bragard et Schelstraete, 2008; German, 1991). Cependant, l'identification de difficultés d'accès lexical à partir de ces manifestations est complexe parce que celles-ci sont aussi présentes, mais à une fréquence moindre, dans le discours des enfants ayant un développement typique (Best et al., 2018; Dockrell, Messer, George et Ralli, 2003; German, 1991). En effet, les répétitions et les révisions sont fréquentes chez les enfants ayant un développement typique (German et Simon, 1991). En anglais, le *Test of Word Finding in Discourse* (TWFD), développé en 1991 aux États-Unis par German, permet de faire la différence entre le discours d'un enfant typique et celui d'un enfant présentant des difficultés d'accès lexical dans une tâche de description d'images. Cet outil, qui a eu recours à un échantillon de normalisation composé de 856 enfants typiques et de 43 enfants ayant des difficultés d'accès lexical (tous âgés de

6;06 à 12;11), présente une sensibilité de 0,91 et de 0,80, ce qui correspond à une bonne sensibilité et une spécificité acceptable selon l'échelle d'interprétation des coefficients proposée par Plante et Vance (1994). En français, aucun outil similaire n'est actuellement disponible afin de mettre en évidence des difficultés d'accès lexical. Ce constat est problématique étant donné qu'il est préférable d'utiliser un outil standardisé plutôt que d'effectuer un jugement subjectif (Paul, Norbury et Gosse, 2018). Cette étude pilote tente donc de recueillir des données préliminaires dans un contexte de discours, plus précisément dans un contexte de discours narratif. La narration est une habileté nécessaire à la communication de tous les jours (Gillam et al., 2018; Heilmann, Miller, Nockerts et Dunaway, 2010). La narration fait aussi partie des apprentissages scolaires visés par le programme de formation de l'école québécoise (Ministère de l'Éducation, du Loisir et du Sport, 2011), étant liée à la littératie et au succès académique (Griffin, Hemphill, Camp et Wolf, 2004; O'Neill, Pearce et Pick, 2004).

Même dans les cas où des données normatives sont disponibles, l'identification de difficultés d'accès lexical reste complexe puisque les manifestations mentionnées ci-haut ne sont pas exclusives à l'accès lexical. Certaines de ces manifestations servent plutôt à signaler que le locuteur rencontre des difficultés, qu'elles soient liées à l'accès lexical ou non (Corley et Stewart, 2008; pour les interjections). Voilà pourquoi nous aurons recours au terme *caractéristiques d'accès lexical*, tel que proposé par German et Simon (1991). Il est cependant souvent difficile, voire impossible, d'identifier la cause exacte de ces manifestations (Corley et Stewart, 2008), rendant l'évaluation de l'accès lexical complexe. Grâce aux études sur les disfluidités (les répétitions, les révisions et les interjections), il est toutefois possible d'identifier certains facteurs qui pourraient avoir un impact sur la fréquence des caractéristiques d'accès lexical observées : la langue parlée, la tâche, ainsi que la longueur et la complexité des énoncés. Une étude de Leclercq, Suaire et Moyse (2018) réalisée auprès d'enfants francophones belges de quatre ans présentant un développement langagier typique suggère que la fréquence des disfluidités varierait selon la langue parlée par l'enfant. Leclercq et al. (2018) ont observé un nombre important de répétitions, de révisions et d'interjections en conversation, à tel point que la moitié de leur échantillon surpassait les seuils proposés pour l'anglais. Ces disfluidités étaient aussi plus fréquentes en français que dans les études précédentes effectuées en anglais, en allemand et en espagnol. En plus de la langue parlée, certaines tâches entraîneraient davantage de disfluidités. Les disfluidités signalent un degré de charge cognitive plus important pour le locuteur (Corley et Stewart, 2008). Les tâches complexes, parce qu'elles impliquent une

planification et une organisation importantes, susciteraient plus de disfluidités (Bortfeld, Leon, Bloom, Schober et Brennan, 2001; Cleave, Kay-Raining Bird, Squires et Cahill, 2018; German et Simon, 1991). Les données expérimentales semblent corroborer cette affirmation. Cleave et al. (2018) ont observé une fréquence plus importante de disfluidités pendant l'explication d'un jeu que pendant la conversation chez des enfants d'âge scolaire n'ayant pas de trouble développemental du langage. Wagner, Nettelbladt, Sahlen et Nilholm (2000) ont observé une fréquence plus importante de disfluidités pendant la narration que pendant la conversation chez des enfants de cinq ans ayant un trouble développemental du langage. La longueur et la complexité des énoncés pourraient également expliquer les différences entre les tâches. Par exemple, dans Cleave et al. (2018), les énoncés lors de l'explication d'un jeu étaient plus longs qu'en conversation. Les études s'intéressant à la longueur moyenne des énoncés et la présence de disfluidités arrivent à la même conclusion, tout en ajoutant que les énoncés complexes tendent aussi à susciter plus de disfluidités (Yaruss, Newman et Flora, 1999; Zackheim et Couture, 2003). Donc, les études sur les disfluidités suggèrent qu'un changement dans la langue parlée, dans la tâche ou dans la longueur moyenne des énoncés pourrait biaiser l'interprétation de la comparaison aux données normatives disponibles relatives à la fréquence des disfluidités ou des caractéristiques d'accès lexical.

En plus du discours, l'évaluation de l'accès lexical devrait inclure des tâches de dénomination et de désignation, qui lui sont complémentaires (Bragard et al., 2010; German, 2009; Paul et al., 2018). Le recours à de multiples sources d'information, en combinant des tâches langagières décontextualisées (comme la dénomination et la désignation) à une tâche discursive, pourrait permettre une meilleure identification des difficultés d'accès lexical, similairement à ce qui est avancé dans la littérature sur le trouble développemental du langage (Bishop, Snowling, Thompson, Greenhalgh et CATALISE consortium, 2016; Imgrund, Loeb et Barlow, 2019). De plus, la dénomination et la désignation permettent de faire la distinction entre des difficultés d'accès lexical et un faible vocabulaire en vérifiant la compréhension des mots échoués (Bragard et al., 2010). Il est généralement attendu qu'un enfant présentant des difficultés d'accès lexical obtienne un score standard faible en dénomination (en termes d'exactitude et de temps de réponse), mais pas en désignation (Bragard et al., 2010; Dockrell, Messer et George, 2001; Leonard, 2014; Paul et al., 2018). Chez un enfant ayant un développement typique ou un faible vocabulaire, l'écart entre les scores standards devrait être négligeable. Les écarts supérieurs à un certain seuil (désignation > dénomination) sont considérés comme pathologiques, c'est-à-dire qu'ils suggèrent la présence de

difficultés d'accès lexical (p. ex. German, 2015). Il n'existe actuellement aucun seuil proposé pour les orthophonistes œuvrant auprès d'une clientèle francophone. Le seul outil francophone (Bragard et al., 2010), destiné à la mise en évidence de difficultés d'accès lexical et étalonné à partir d'un échantillon belge, ne propose pas de tels seuils.

D'un point de vue théorique, il serait attendu d'observer une corrélation négative entre une tâche de dénomination et une tâche discursive (Tingley, Kyte, Johnson et Beitchman, 2003). Plus précisément, les enfants ayant de la difficulté à nommer des mots en dénomination devraient aussi avoir de la difficulté à accéder à des mots en discours, se traduisant par une présence accrue de caractéristiques d'accès lexical (German, 1991; Tingley et al., 2003). Selon nos connaissances théoriques et cliniques actuelles, le résultat en dénomination et la fréquence des caractéristiques d'accès lexical en discours évaluent la même habileté : l'accès lexical, soit la capacité à récupérer rapidement la forme phonologique d'un mot précis (German, 1991). Une corrélation forte indiquerait que ces mesures évaluent le même construit, mais qu'elles sont redondantes. Une corrélation faible et significative indiquerait que les mesures évaluent partiellement le même construit, mais que d'autres processus cognitifs ou langagiers faisant varier les capacités d'accès lexical d'une tâche à l'autre entrent en jeu, tel qu'énoncé plus haut (German, 1991). Une corrélation non significative pourrait remettre en question l'affirmation que les mesures évaluent le même construit (Tingley et al., 2003). Les données expérimentales sont peu nombreuses et rapportent des corrélations nulles ou faibles. Dans le TWFD, seules des corrélations faibles (valeurs de r entre $-0,1307$ et $0,1054$) sont rapportées entre les résultats au TWFD et ceux au *Test of Word Finding* (tâches de dénomination; German, 1986) pour les enfants ayant un développement typique. Les valeurs de p n'étaient pas rapportées, mais le manuel laisse croire qu'elles étaient supérieures à $0,05$, suggérant qu'il n'existe pas de lien entre les deux tâches chez cette population. Les corrélations étaient toutefois plus élevées pour le groupe d'enfants ayant des difficultés d'accès lexical. La corrélation était significative pour le groupe plus vieux (3^e-6^e année; $n = 23$; $r = -0,42$; $p < 0,01$), mais pas pour le groupe plus jeune (1^e-2^e année; $n = 20$; $r = -0,27$; $p > 0,05$). Une autre étude (Tingley et al., 2003), réalisée chez de jeunes adultes avec et sans trouble de langage, n'a pas observé de corrélation significative entre les résultats au *Test of Adolescent/Adult Word Finding* (German, 1990), qui comprend plusieurs épreuves de dénomination et de désignation, et les caractéristiques d'accès lexical observées en discours. De façon générale, les résultats des études précédentes sont mitigés sur le lien entre la

dénomination et les caractéristiques d'accès lexical en discours.

Les objectifs de l'étude pilote étaient donc de :

1. Recueillir des données préliminaires quant aux caractéristiques d'accès lexical attendues dans la narration d'enfants ayant un développement typique à des fins d'analyse exploratoire;
2. Vérifier si une association entre la dénomination (exactitude et temps de réponse) et la présence de caractéristiques d'accès lexical en narration serait mise en évidence.

Méthodologie

Participants

Ce projet a été approuvé par le Comité d'éthique de la recherche des établissements du Centre de recherche interdisciplinaire en réadaptation du Montréal métropolitain (projet CRIR-1207-1216).

Onze enfants unilingues francophones, âgés entre 6;10 et 9;6 ans, ont été recrutés. L'échantillon était composé de six filles et de cinq garçons. Ceux-ci ont été recrutés par le biais d'affiches et de lettres de recrutement. Les affiches de recrutement ont été placées dans divers endroits fréquentés par les familles (bibliothèques, centres sportifs, centres communautaires, etc.), sur les réseaux sociaux et sur le site Internet de l'École d'orthophonie et d'audiologie, alors que les lettres de recrutement ont été remises à des élèves provenant d'une école privée de Montréal.

Les participants présentaient un développement typique, tel que rapporté par les parents par le biais d'un questionnaire de développement et d'un questionnaire de dépistage des difficultés d'accès lexical (c.-à-d. le *Word Finding Referral Checklist*; German et German, 1992). Le premier questionnaire comprenait notamment des questions sociodémographiques et des questions relatives aux inquiétudes des parents. Le deuxième était un questionnaire en anglais comprenant quinze questions portant notamment sur la présence des caractéristiques d'accès lexical au quotidien. Les réponses possibles à la version originale de ce deuxième questionnaire sont *oui* ou *non* selon la présence ou l'absence, respectivement, de ces caractéristiques. À titre d'exemple, la question cinq est la suivante : « Habituellement, est-ce que l'enfant donne une mauvaise réponse, puis se corrige (p. ex. 'basketball, non football')? » Le nombre de réponses oui est alors comptabilisé pour obtenir un résultat total sur 15. Ce questionnaire n'a fait objet d'aucune standardisation,

mais un résultat supérieur à six est considéré comme une indication qu'un enfant nécessite une évaluation en orthophonie (German et German, 1992). Dans le cadre de cette étude, le *Word Finding Referral Checklist* a d'abord été traduit en français. Deux réponses possibles (*Il me semble* et *Je ne crois pas*) ont été ajoutées aux deux réponses du questionnaire original (*Oui* et *Non*), tel que proposé par Paul (2016). Ces catégories avaient été ajoutées à un questionnaire de développement du langage développé par Paul (2016) pour répondre à l'incertitude qu'éprouvait le parent en remplissant un questionnaire sur son enfant. Les catégories *Il me semble* et *Je ne crois pas* ont tout de même été traitées comme *Oui* et *Non* respectivement, tel que décrit par Paul (2016). Concernant la traduction, les recommandations de l'Organisation mondiale de la santé (s. d.) ont été suivies. La traduction de l'anglais vers le français a été vérifiée par deux individus bilingues (la deuxième auteure et un adulte bilingue n'étant pas du domaine de l'orthophonie). Finalement, une orthophoniste bilingue a retraduit le nouveau questionnaire vers l'anglais. Les seules différences dans la traduction correspondaient à des synonymes. Notons qu'un participant a obtenu un résultat supérieur à six, mais a tout de même été inclus dans notre échantillon. Une courte discussion avec le parent a pu mettre en évidence une absence d'inquiétude et que le score élevé était vraisemblablement dû à une mauvaise compréhension de certains items.

Procédures

Les enfants ont été évalués dans un local calme de l'École d'orthophonie et d'audiologie. La durée de l'expérimentation était d'environ une heure et des pauses étaient accordées aux enfants si nécessaire. Suivant les recommandations actuelles (Bragard et al., 2010; German, 2009; Paul et al., 2018), nos procédures incluaient des tâches de dénomination et désignation, de même que des

tâches discursives. L'ordre des tâches était le même pour tous les enfants : dénomination, désignation, histoire à compléter, puis histoire à raconter à partir d'une image.

Dénomination et désignation. Les tâches de dénomination et de désignation des chercheurs belges Bragard et al. (2010) ont été développées afin de mettre en évidence des difficultés d'accès lexical chez des enfants de 7 à 12 ans. Ces tâches sont effectuées sur un ordinateur avec des photographies couleur. Les images représentent des noms appartenant à plusieurs catégories sémantiques, comme les animaux, les vêtements, les aliments et les parties du corps. À la tâche de dénomination, le participant doit nommer la photographie qui lui est présentée. L'expérimentateur doit alors appuyer sur une touche lorsque l'enfant a répondu pour enregistrer le temps de réponse. À la tâche de désignation, le participant doit identifier, parmi cinq options, la photographie qui correspond au mot dit par l'ordinateur. Des cercles de différentes couleurs sont présents sur l'écran sous chaque photographie et sur différentes touches du clavier. Pour faire son choix, l'enfant doit appuyer sur la touche du clavier correspondante. Le temps de réponse est automatiquement enregistré. Les tâches de dénomination et de désignation ont recours aux mêmes 80 photographies couleur. En présentant les mêmes items pour les deux tâches, l'expérimentateur peut vérifier l'écart entre la production et la compréhension de mots, lui permettant de suggérer la présence de difficultés d'accès lexical. Comme les réponses attendues reposent sur un échantillon de référence belge, certaines réponses supplémentaires ont été acceptées : *chandelle* pour *bougie* et *mitaines* pour *moufles*, car l'équipe de recherche les a jugées comme équivalentes au Québec. Les résultats des participants à ces deux tâches, de même que leurs caractéristiques sociodémographiques, sont présentés dans le **tableau 1**.

Tableau 1		
Caractéristiques des participants (N = 11)		
	M	ÉT
Âge (mois)	93,4	9,8
Éducation maternelle (années)	16,5	3,8
Questionnaire de dépistage des difficultés d'accès lexical (score brut)	2,5	2,9
Dénomination (pourcentage de réponses correctes)*	81,5	6,7
Temps de dénomination (secondes)*	2,4	0,4
Désignation (pourcentage de réponses correctes)*	87,8	3,6

Note. *Tâches de Bragard, Schelstraete, Collette et Grégoire (2010).

Narrations. Les participants ont pris part à deux tâches de narration pour diversifier et allonger l'échantillon de langage recueilli, ainsi que pour éviter de limiter l'évaluation des habiletés à un seul contexte. Des enregistrements audio des deux histoires racontées par les enfants ont été réalisés. La première épreuve était une histoire à compléter. L'expérimentateur commençait l'histoire en lisant une phrase, « Il y avait un gros renard gris qui vivait dans une grotte... », puis expliquait à l'enfant que ce dernier devait terminer l'histoire. Seul ce support verbal était fourni à l'enfant. Ensuite, l'expérimentateur racontait une histoire à partir d'une image, ce qui servait de modèle pour la deuxième épreuve de narration. L'enfant devait ensuite générer une histoire à partir d'une seconde image où deux enfants voient des extraterrestres descendre d'une soucoupe volante dans un parc. Cette image représentant une scène complexe sert de tremplin pour la narration. Le modèle d'histoire et l'image utilisée pour la génération d'histoire étaient issus d'une traduction du *Test of Narrative Language* (Gillam et Pearson, 2004).

Analyse

German (1991) affirme que la méthode d'analyse décrite dans le TWFD (qui est appliquée à un discours obtenu dans une tâche de description d'images) est transférable à d'autres types de discours tels que la narration. Toutefois, en contexte de narration, les données normatives du TWFD ne peuvent être utilisées directement pour y comparer la performance de l'enfant (German, 1991). Les étapes de l'analyse de German (1991) sont les suivantes :

1. Transcrire l'échantillon de langage et segmenter le discours en unités T. Les unités T sont similaires aux énoncés; elles comprennent une phrase principale et des subordinées. Une phrase coordonnée est, quant à elle, comptabilisée comme deux unités T (German, 1991).
2. Analyser chaque unité T afin de déterminer s'il y a présence des sept caractéristiques d'accès lexical : répétitions, révisions, mots vides, commentaires métacognitifs ou métalinguistiques, substitutions, pauses, interjections. Les définitions des caractéristiques d'accès lexical peuvent être retrouvées dans le TWFD (German, 1991) ou dans l'article de German et Simon (1991). Nous rapportons une traduction des définitions et des exemples dans l'annexe.
3. Calculer deux pourcentages :
 - a. un pourcentage d'unités T comprenant chacune des caractéristiques d'accès lexical (un

pourcentage par type de caractéristique identifié à l'étape 2). Ce pourcentage est utilisé à titre descriptif seulement.

- b. un pourcentage total d'unités T comprenant au moins une caractéristique d'accès lexical (%TDAL; tous types confondus).
4. Comparer le pourcentage obtenu à l'étape 3b à celui de l'échantillon de normalisation du TWFD. Les données normatives ne sont pas décomposées selon l'âge puisque celui-ci n'avait aucun impact dans l'échantillon normatif du TWFD. Un score standard inférieur à 85, ou un %TDAL supérieur à 33%, suggère la présence de difficultés d'accès lexical.

Un nombre minimal total de 21 unités T est nécessaire afin d'effectuer l'analyse de German (1991) puisqu'aucun participant de l'échantillon normatif n'en avait produit moins. Cette recommandation est cohérente avec les résultats d'une étude réalisée auprès d'enfants franco-québécois d'âge préscolaire en situation de jeu libre. En effet, Elin Thordardottir (2016) notait qu'un échantillon de 25 énoncés était hautement représentatif d'une collecte plus grande de 100 énoncés en ce qui concerne la présence de disfluidités. Ainsi, nous souhaitons que les tâches expérimentales soient capables de susciter un minimum de 25 unités T chez les participants.

Accord interjuge. Un accord interjuge a été réalisé sur l'ensemble des données. Les juges (le premier auteur et une étudiante en orthophonie) ont été formés à l'aide du manuel du TWFD (German, 1991) et d'un aide-mémoire résumé créé par le premier auteur. Dans un premier temps, un pourcentage d'accord ($\text{nombre d'accords} / [\text{nombre d'accords} + \text{nombre de désaccords}] * 100$) a été calculé pour la séparation en unités T, ce qui a résulté en un accord de 91,6%. Comme la suite de l'analyse reposait sur la séparation en unités T, les juges ont fait consensus sur les désaccords dans la séparation en unités T. L'accord a ensuite pu être calculé sur le pourcentage d'unités T comprenant chacune des caractéristiques d'accès lexical et le %TDAL. Nous rapportons, dans le **tableau 2**, les pourcentages d'accord ainsi que les valeurs de kappa de Cohen (coefficient qui prend en compte l'accord par chance; Cohen, 1960) pour chacune de ces mesures. Étant donné la nature non dichotomique de la séparation en unités T, seul le pourcentage d'accord a été calculé pour cette mesure.

Toutes les mesures, soit la séparation en unités T, le %TDAL et les pourcentages d'unités T comprenant chacune des caractéristiques d'accès lexical, obtiennent un

pourcentage d'accord très élevé (89% et plus) et la majorité des mesures obtiennent des valeurs de kappa témoignant d'un degré d'accord modéré à substantiel (0,61 et plus selon Landis et Koch (1977))¹. Trois mesures obtiennent des valeurs de kappa témoignant d'un degré d'accord passable : les pauses ($\kappa = 0,453$), les substitutions ($\kappa = 0,448$) et les interjections ($\kappa = 0,393$), et ce, même si le pourcentage d'accord est très élevé (> 95%). Il s'avère que ces trois caractéristiques d'accès lexical sont peu fréquentes chez nos participants. Les statistiques kappa peuvent sous-estimer l'accord lorsque les totaux marginaux d'une table de contingence sont débalancés, c'est-à-dire lorsqu'une caractéristique est très peu fréquente ou très fréquente (Gwet, 2008; Quarfoot et Levine, 2016). Ce phénomène bien documenté est connu sous le nom de « paradoxe de kappa » (Gwet, 2008).

Résultats

Productivité

Tout d'abord, des scores de productivité du langage ont été calculés pour la combinaison des narrations et ceux-ci se retrouvent dans le **tableau 3**. Concernant le nombre total d'unités T, deux participants ont produit moins de 25 unités T, soit 18 et 23, mais ceux-ci ont tout de même été inclus dans l'analyse étant donné le statut exploratoire de cette étude.

Caractéristiques d'accès lexical

Le **tableau 4** présente les pourcentages d'unités T comprenant chacune des caractéristiques d'accès lexical et met en évidence que les trois caractéristiques d'accès

Accord interjuge			
	Pourcentage d'accord	Kappa de Cohen	Intervalle de confiance à 95%
Unités T	91,6	-	-
Substitutions	95,1	0,448	[0,245-0,651]
Commentaires	99,8	0,799	[0,412-1,000]
Pauses (6s+)	98,3	0,453	[0,112-0,793]
Interjections (3+)	98,5	0,393	[0,004-0,781]
Révisions	90,9	0,686	[0,592-0,781]
Répétitions	91,9	0,793	[0,725-0,860]
Mots vides	95,3	0,606	[0,447-0,766]
%TDAL	89,0	0,771	[0,707-0,834]

Note. %TDAL = Pourcentage d'unités T comprenant au moins une caractéristique d'accès lexical.

Productivité des participants (histoires combinées) et comparaison avec un sous-échantillon du <i>Test of Word Finding in Discourse</i> *					
	M	ÉT	Étendue	MTWFD	ÉT _{TWFD}
Nombre d'unités T	37,6	15,2	18-73	46,2	18,8
Nombre total de mots	355,2	143,1	169-665	362,33	96,30
Nombre total de mots différents	132,4	35,5	73-193	N/A	N/A
LMT-mots	9,5	1,2	8,0-12,4	6,9	1,1

Note. *Le sous-échantillon du TWFD est composé de 30 participants. LMT-mots = longueur moyenne de l'unité T en mots; TWFD = *Test of Word Finding in Discourse* (German, 1991).

¹ Il n'y a actuellement pas de consensus clair sur l'interprétation des kappa de Cohen. Selon Landis et Koch (1977, p. 165), l'accord selon les valeurs de κ est < 0 : pauvre; 0,00-0,20 : léger; 0,21-0,40 : passable; 0,41-0,60 : modéré; 0,61-0,80 : substantiel; 0,81-1,00 : presque parfait [traduction libre].

lexical les moins fréquentes chez nos participants sont les commentaires métalinguistiques (1,1% des énoncés), les pauses de plus de six secondes (1,4% des énoncés) et la présence de trois interjections ou plus dans une unité T (1,6% des énoncés). De plus, seules les révisions et les répétitions ont été produites par tous les enfants.

Comparaison avec le *Test of Word Finding in Discourse*

Les résultats de nos participants ont été comparés aux résultats de deux sous-échantillons d'enfants n'ayant pas de difficultés d'accès lexical qui ont participé à la normalisation du TWFD (German, 1991), selon les données disponibles dans le manuel de l'examineur. Rappelons que le TWFD a été développé pour des enfants anglophones âgés de 6 à 12 ans en contexte de description d'images. Les scores de productivité ont été comparés à ceux d'un sous-groupe de 30 enfants et les scores relatifs aux pourcentages des caractéristiques d'accès lexical à ceux d'un sous-groupe de 43 enfants. Ces résultats ont été analysés à l'aide de tests *t* pour échantillons indépendants à partir de données résumées. Lorsqu'applicable, l'égalité des variances n'a pas été présumée et la valeur *p* donnée en tient compte. Enfin, les résultats de nos participants ont été convertis en scores standards afin de décrire leurs résultats individuels. Comme le suggère le TWFD, nous n'avons pas pris en compte l'âge ou le sexe des participants dans les analyses.

En ce qui concerne la productivité, il existe une différence significative pour la longueur moyenne de l'unité T ($t(39) = 6,548; p < 0,001$), mais pas pour le nombre total d'unités T ($t(39) = -1,360; p = 0,182$) ou de mots ($t(13,469) = -0,153; p = 0,881$). La longueur moyenne des énoncés était

plus élevée chez nos participants que dans le sous-groupe du TWFD.

En ce qui concerne les pourcentages des caractéristiques d'accès lexical, il existe une différence significative pour les répétitions ($t(10,966) = 4,352; p = 0,001$), les révisions ($t(52) = 5,328; p < 0,001$), les substitutions ($t(52) = -2,616; p < 0,012$), mais pas pour les mots vides ($t(52) = 1,775; p = 0,082$), les interjections ($t(10,421) = 1,524; p = 0,157$), les pauses ($t(10,685) = 0,791; p = 0,445$) ou les commentaires ($t(52) = 0,620; p = 0,538$). Les répétitions et les révisions étaient plus fréquentes chez nos participants que dans le sous-groupe du TWFD, alors que les substitutions étaient plus fréquentes dans le sous-groupe du TWFD.

Les pourcentages d'unités T comprenant au moins une caractéristique d'accès lexical ont été convertis en scores standards afin de pouvoir les comparer à l'échantillon de normalisation du TWFD (German, 1991). La distribution des scores standards de notre échantillon s'apparente à une distribution normale, mais dont la moyenne est inférieure à l'échantillon normatif. En effet, plus de la moitié de nos participants (63,6%) ont obtenu un score standard suggérant la présence de difficultés d'accès lexical si les normes du TWFD sont directement appliquées. Rappelons que les normes du TWFD ont été obtenues auprès d'enfants anglophones qui ont accompli une tâche de description d'images.

Corrélations

Des corrélations de Pearson ont été calculées pour vérifier le lien entre la tâche de dénomination (exactitude

Tableau 4

Caractéristiques d'accès lexical en pourcentage d'unités T et comparaison avec un sous-échantillon du TWFD^a

	<i>M</i>	<i>ÉT</i>	Étendue	Participants ^b	<i>M</i> _{TWFD}	<i>ÉT</i> _{TWFD}
Répétitions	28,1	13,7	15,1-56,0	11	9,7	5,9
Révisions	19,5	7,9	8,2-31,6	11	8,5	5,6
Mots vides	3,9	4,3	0,0-12,0	6	1,7	3,9
Substitutions	3,3	4,6	0,0-26,1	6	7,8	5,2
Interjections (3+)	1,6	2,8	0,0-8,6	4	0,3	0,8
Pauses (6s+)	1,4	3,3	0,0-11,1	2	0,6	1,2
Commentaires	1,1	1,1	0,0-8,7	2	0,8	1,5
%TDAL	39,8	17,3	16,7-76,0	-	18,1	7,8

Note. ^aLe sous-échantillon du TWFD est composé de 43 participants. ^bLes résultats présentés dans cette colonne correspondent au nombre de participants de notre étude ayant produit la caractéristique d'accès lexical. %TDAL = Pourcentage d'unités T comprenant au moins une caractéristique d'accès lexical; TWFD = *Test of Word Finding in Discourse* (German, 1991).

et temps de réponse) et le %TDAL. Parmi celles-ci, celles pour le temps de réponse ($r = -0,111; p = 0,744$) et pour l'exactitude ($r = 0,107; p = 0,753$) n'étaient pas significatives, même en contrôlant pour le résultat en désignation ($r = 0,124; p = 0,732$).

Discussion

L'étude pilote poursuivait les objectifs de recueillir des données préliminaires quant à la fréquence de caractéristiques d'accès lexical en narration, ainsi que de vérifier si une association avec la dénomination serait mise en évidence.

Fréquence des caractéristiques d'accès lexical

Les résultats suggèrent que trois des caractéristiques d'accès lexical sont peu fréquentes chez les enfants typiques : les pauses de plus de six secondes, les commentaires métacognitifs et les énoncés comprenant trois interjections ou plus. Ces caractéristiques sont également les trois moins fréquentes chez les enfants anglophones en contexte de description d'images (German, 1991) et apparaissent à une fréquence semblable. Dans le TWFD, ces trois caractéristiques sont d'ailleurs significativement plus fréquentes chez les enfants ayant des difficultés d'accès lexical que chez ceux qui n'en ont pas (German, 1991). D'autres recherches devront déterminer si la similitude avec le TWFD se maintient dans un échantillon plus grand et comprenant des enfants identifiés comme ayant des difficultés d'accès lexical, auquel cas ces trois caractéristiques pourraient devenir d'éventuels drapeaux rouges dans l'identification de difficultés d'accès lexical.

Notre étude pilote remet aussi en doute le bien-fondé de l'utilisation des données normatives du TWFD (German, 1991) avec une tâche ou une population différente de l'échantillon normatif. Cette affirmation est motivée par des différences entre les deux échantillons au sujet des pourcentages calculés, soit les %TDAL et ceux comprenant des répétitions, des révisions et des substitutions. Les %TDAL suggèrent que plus de la moitié de nos participants, qui ont un développement langagier typique, présentent des difficultés d'accès lexical, ce qui remet en question la spécificité de la mesure dans notre échantillon. Au sujet des caractéristiques d'accès lexical plus précisément, les répétitions et les révisions sont plus fréquentes chez nos participants, alors que les substitutions sont plus fréquentes dans l'échantillon du TWFD. Les répétitions et les révisions plus fréquentes dans notre échantillon pourraient être expliquées par la tâche, la langue parlée, la longueur moyenne des énoncés ou une combinaison de ces facteurs. La narration est une tâche qui semble

impliquer un degré de charge cognitive supérieur à la description d'images. Lorsqu'ils génèrent une histoire, les enfants doivent planifier et organiser les événements d'une histoire, ce qui n'est pas requis, ou d'importance moindre, dans la tâche de description d'images du TWFD. La charge cognitive nécessaire à la planification et l'organisation se reflèterait dans notre échantillon par la présence de disfluidités, comme des répétitions, des révisions et des interjections. Par exemple, un des participants a produit « Et puis ils [les extraterrestres] sont retournés, ils, ils ne sont pas, il est, ils sont pas retournés. » pendant l'histoire des extraterrestres du *Test of Narrative Language*. Dans cet extrait, il nous apparaît clair que les révisions et répétitions ne sont pas liées à la recherche d'un mot particulier, mais plutôt à un changement dans l'organisation de l'histoire. Dans le même ordre d'idée, la langue parlée par les participants, soit le français, et les énoncés plus longs sont aussi deux facteurs qui pourraient avoir engendré une présence accrue de répétitions et de révisions dans notre échantillon. Ceci n'est pas sans rappeler les résultats des études de Leclercq et al. (2018) quant au français et Zackheim et Conture (2003) quant à la longueur moyenne des énoncés. Les substitutions plus fréquentes dans l'échantillon de normalisation du TWFD (German, 1991) pourraient être expliquées par le contexte qui est différent de celui des tâches de la présente étude. Dans le TWFD, l'enfant doit décrire ce qu'il voit sur une image. L'examineur peut facilement identifier une substitution produite par l'enfant grâce au support visuel. Dans nos deux tâches de narration, seule une partie de l'histoire est présentée à l'enfant (oralement ou visuellement). L'examineur peut alors difficilement identifier une substitution lorsque l'enfant génère des éléments qui ne sont pas illustrés. En effet, sans une référence claire (notamment visuelle), l'enfant peut générer l'histoire qu'il souhaite, ce qui rend difficile l'identification des mots cibles et, par ricochet, l'identification des substitutions. Similairement, Tingley et al. (2003) ont indiqué qu'il était difficile d'identifier les substitutions en conversation auprès de jeunes adultes. Ces auteurs ont ultimement retiré les substitutions de leur analyse. Ainsi, les différences concernant les fréquences des différentes caractéristiques d'accès lexical nous amènent à recommander aux orthophonistes de faire preuve d'une grande prudence si les données normatives du TWFD sont utilisées avec des enfants franco-québécois. Nos résultats auprès de onze enfants suggèrent qu'elles ne sont pas applicables à la population franco-québécoise en contexte de narration. D'autres études sont nécessaires afin de déterminer si cette recommandation tient aussi pour le contexte de description d'images.

Association entre la dénomination et le discours

Les corrélations n'ont pas révélé d'association significative entre le résultat en dénomination et le %TDAL. L'absence de corrélation est cohérente avec les études précédentes (German, 1991; Tingley et al., 2003). Le recours à un plus grand échantillon ou un échantillon comprenant un groupe d'enfants ayant des difficultés d'accès lexical pourrait permettre de révéler une corrélation entre les deux contextes (German, 1991). Ainsi, bien que l'analyse des caractéristiques d'accès lexical actuelle, proposée par German (1991), puisse permettre de bien identifier des difficultés d'accès lexical en milieu clinique, du moins chez les enfants anglophones, elle n'est potentiellement pas assez précise pour mettre en évidence une corrélation entre les deux contextes. En effet, nous soutenons que plusieurs disfluidités, comme dans l'exemple présenté ci-haut, peuvent être en lien avec des facteurs autres que l'accès lexical. Or, ces caractéristiques d'accès lexical, qui devraient plutôt être analysées comme des disfluidités, sont tout de même comptabilisées dans les pourcentages calculés. Ces disfluidités constituent donc du « bruit » dans l'évaluation de l'accès lexical en gonflant la fréquence des caractéristiques d'accès lexical en narration. Ces disfluidités pourraient ainsi dissimuler la corrélation théoriquement attendue entre les deux contextes. Par conséquent, il pourrait être intéressant de modifier l'analyse du TWFD, en ne prenant en compte que les caractéristiques d'accès lexical qui sont véritablement en lien avec l'accès lexical.

Actuellement, l'absence de corrélation significative peut servir à remettre en doute nos connaissances théoriques actuelles, à savoir si la dénomination et la désignation mesurent le même construit que l'analyse du TWFD en discours (du moins dans sa forme actuelle; Tingley et al., 2003). Il est toutefois nécessaire d'examiner cette relation auprès d'une population d'enfants présentant des difficultés d'accès lexical. L'absence de corrélation significative permet aussi d'appuyer les recommandations actuelles (Bragard et al., 2010; German, 2009; Paul et al., 2018) quant à l'importance d'évaluer l'accès lexical en discours. En effet, chez nos participants, la dénomination ne peut servir à prédire la fréquence des caractéristiques d'accès lexical en contexte de narration. Il nous apparaît donc essentiel de continuer les recherches sur la narration afin d'offrir des recommandations aux orthophonistes quant aux tâches à privilégier dans l'évaluation de l'accès lexical.

Limitations et recherches futures

Une des limitations importantes de cette étude pilote est la généralisabilité à la population franco-québécoise. Outre le nombre limité de participants, une grande proportion d'entre eux étaient issus d'un milieu socio-économique

élevé tel que mesuré par l'éducation maternelle. Notons toutefois que German (1991) n'a pas relevé de lien entre l'éducation maternelle et le résultat au TWFD. De plus, étant donné le statut exploratoire de cette étude pilote, nous avons choisi d'inclure des participants qui remplissaient partiellement les critères (résultat au questionnaire de dépistage et nombre d'unités T). Les résultats rapportés sont donc à interpréter avec précaution et d'autres études sont nécessaires.

Concernant l'accord interjuge, les caractéristiques d'accès lexical bénéficient d'un excellent pourcentage d'accord, mais certaines valeurs de kappa sont passables. Des efforts supplémentaires sont nécessaires afin d'améliorer la formation des codeurs et de préciser la nature de chaque caractéristique d'accès lexical. Nous souhaitons également améliorer l'accord dans la séparation en unités T étant donné que ces décisions peuvent avoir un impact sur le %TDAL d'un individu.

Concernant la productivité, deux des enfants n'ont pas atteint notre seuil de 25 énoncés. Une tâche supplémentaire pourrait être ajoutée afin que tous les enfants produisent un échantillon de longueur suffisante.

Cette étude pilote constitue la première étape d'un projet à long terme qui vise à développer un outil d'évaluation de l'accès lexical en contexte de narration et à mieux comprendre l'origine des difficultés d'accès lexical. D'autres recherches déjà entamées auront recours à un échantillon de plus grande taille, constitué d'enfants avec et sans difficultés d'accès lexical. De plus, nous ajouterons une version traduite de la tâche de description d'images du TWFD afin de mieux départager les effets de la langue (français québécois ou anglais américain) ou de la tâche (narration ou description) sur les caractéristiques d'accès lexical en contexte discursif.

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Note des auteurs

Les demandes au sujet de cet article doivent être adressées à Natacha Trudeau, École d'orthophonie et d'audiologie, Université de Montréal, C.P. 6128, Succursale Centre-Ville, Montréal, QC, Canada, H3T 1C7. Courriel : natacha.trudeau@umontreal.ca

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Déclaration

Les auteurs déclarent n'avoir aucun conflit d'intérêts, financiers ou autres.

Annexe

Liste des caractéristiques d'accès lexical

Le nom des caractéristiques d'accès lexical, leur définition et des exemples de chacune se retrouvent dans le **tableau A1**. Les caractéristiques d'accès lexical et leur définition ont été tirées de German et Simon (1991) et German (1991). Les termes français proviennent de Bragard et Schelstraete (2008) lorsque disponible, ou encore, ont été traduits littéralement. Les exemples fournis proviennent du corpus de nos participants.

Tableau A1		
Caractéristiques d'accès lexical tirées de German et Simon (1991) et German (1991)		
Noms des caractéristiques	Définitions	Exemples
Répétitions	Mots répétés dans un énoncé.	« <u>Ils</u> <u>ils</u> voient une soucoupe volante arriver. »
Révisions	Mots qui ont été changés ou remplacés par une révision dans un énoncé.	« Elle est contente <u>pour</u> , <u>de</u> savoir que [...] »
Mots vides	Mots qui n'ajoutent pas de contenu ou d'information (p. ex. « tu sais/t'sais, voyons voir, oh, bien »).	« <u>Bien</u> ils courent vite chez eux. »
Commentaires métacognitifs ou métalinguistiques	Commentaires sur le processus langagier lui-même (p. ex. « je sais pas », « je veux dire »).	« Il est allé chercher <u>je sais pas</u> . »
Substitutions	Mots dans un énoncé qui substituent un mot cible. Les substitutions peuvent être similaires au plan sémantique, phonologique ou perceptuel (p. ex. visuel). Elles peuvent aussi être non spécifiques.	« Il voulait savoir si c'était des vrais <u>astronautes</u> [<u>extraterrestres</u>]. »
Pauses	Délais de six secondes ou plus sans verbalisation.	« Et là après (<u>6s</u>) ... il a rencontré un wapiti. »
Interjections	Voyelles ou syllabes allongées qui visent à combler le temps dans un énoncé. L'unité T doit en comprendre au moins 3 pour que l'interjection soit comptabilisée.	« Un <u>euu</u> , un <u>euu</u> , un espèce de <u>euu</u> ce truc-là. »

Note. Les exemples de caractéristique sont soulignés dans les extraits.



Maintenir une communication satisfaisante avec les personnes souffrant de la maladie d'Alzheimer : création de capsules vidéo destinées aux proches aidants



Maintaining Satisfactory Communication with People Suffering from Alzheimer's Disease: Creation of Videos for Caregivers

MOTS-CLÉS

MALADIE D'ALZHEIMER

PROCHE AIDANT

COMMUNICATION

STRATÉGIE DE COMMUNICATION

CAPSULE VIDÉO

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La communication est un besoin fondamental et il importe de la favoriser jusqu'à la fin de la vie pour permettre à toute personne d'exprimer ses besoins, de participer aux décisions qui la concernent et de maintenir des relations interpersonnelles et affectives satisfaisantes. En plus des problèmes de mémoire qui y sont associés, la maladie d'Alzheimer s'accompagne de troubles progressifs de la communication qui affectent la capacité des individus à s'exprimer oralement et par écrit, à lire, ainsi qu'à comprendre le langage. L'objectif général de ce projet, basé sur les principes généraux de transfert et d'application des connaissances en santé, était de répondre aux besoins des proches aidants de personnes atteintes de la maladie d'Alzheimer d'être mieux informés sur la condition de leur proche et mieux outillés pour faire face aux troubles de la communication qui y sont associés. Les informations vulgarisées portant sur le lien entre l'évolution de la maladie et l'accroissement des difficultés de communication vécues au quotidien sont peu nombreuses. En collaboration avec la Société Alzheimer de Québec et la Faculté de médecine de l'Université Laval, une série de quatre courtes capsules vidéo ont été réalisées dans lesquelles sont expliquées, de manière simple et accessible, les difficultés de communication susceptibles de survenir dans le décours de la maladie et sont proposées des stratégies pour favoriser et maintenir une communication satisfaisante. Ces capsules vidéo ont également le potentiel d'accroître la connaissance du rôle de l'orthophoniste auprès des personnes ayant une maladie neurodégénérative. Les auteurs espèrent qu'elles permettront d'améliorer la qualité de vie des personnes touchées par la maladie d'Alzheimer.

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Abstract

Communication is a fundamental need. It is important to promote communication until the end of life so people can express their needs, take part in decisions that involve them, and maintain satisfying interpersonal and emotional relationships. Besides associated memory problems, progressive communication disorders that impact individuals' ability to express themselves orally and in writing, to read, and to understand language characterize Alzheimer's disease. This project used principles of health knowledge transfer and translation. The project's goal was to meet the needs of family caregivers of people suffering from Alzheimer's disease so they are better informed about their loved one's condition and better equipped to deal with the associated communication disorders. There is little widespread information about the link between the progression of the disease and the increased communication difficulties experienced daily. In cooperation with the Société Alzheimer de Québec and the Faculté de médecine de l'Université Laval, we produced a series of four short videos (a) to explain, in a simple and accessible way, the communication challenges that may arise during the course of the disease and (b) to suggest strategies to promote and maintain satisfactory communication. These videos have the potential to increase knowledge of the role of speech-language pathologists with people suffering from a neurodegenerative disease. The authors hope the videos will improve the quality of life of people affected by Alzheimer's disease.

Dans les pays industrialisés, le faible taux de natalité et l'augmentation de l'espérance de vie entraînent un vieillissement de la population. Selon Statistique Canada (2019), le nombre de personnes âgées de 65 ans et plus a connu une forte augmentation au cours des dernières années et ce groupe représente environ 17% de la population canadienne en 2018. La proportion des Canadiens de cette tranche d'âge devrait se situer autour de 25% en 2055 (Statistique Canada, 2019). Ce phénomène démographique induit une augmentation de l'incidence des maladies liées au vieillissement. La maladie d'Alzheimer (MA) est une condition très fréquente parmi les troubles neurocognitifs liés à l'âge et représente entre 50% et 75% des cas de trouble neurocognitif majeur chez l'adulte (Lane, Hardy et Schott, 2018). On estime actuellement qu'environ 40 millions de personnes souffrent de l'une ou l'autre forme de trouble neurocognitif majeur dans le monde et que ce nombre doublera tous les 20 ans, au moins jusqu'en 2050 (Prince et al., 2013). À ce jour, il n'existe aucun traitement pharmacologique permettant de freiner ou de guérir la MA. L'approche thérapeutique de base s'appuie donc essentiellement sur les soins de soutien offerts par la famille, l'entourage et le personnel soignant (Scheltens et al., 2016).

Dans la MA, l'accumulation anormale de protéines amyloïde-beta et tau dans le cerveau entraîne une atrophie corticale, responsable du déclin progressif des fonctions cognitives et de la perte graduelle de l'autonomie dans la réalisation des activités de la vie quotidienne (Scheltens et al., 2016). Selon les plus récents critères diagnostiques de la MA, le déclin cognitif initial peut se manifester selon deux profils prédominants différents, soit : 1) la présentation amnésique, qui est la plus fréquente et dans laquelle sont affectées les capacités d'apprentissage et de rappel des informations apprises, et 2) la présentation non amnésique, dans laquelle les troubles cognitifs peuvent affecter les capacités visuospatiales, le langage (surtout la capacité à trouver les mots), le raisonnement, le jugement ou la résolution de problèmes (McKhann et al., 2011). La MA évolue habituellement selon trois stades de sévérité (Weintraub, Wicklund et Salmon, 2012). Au stade léger, la personne peut encore vivre de manière indépendante, mais peut éprouver régulièrement des difficultés de mémoire, de langage et de raisonnement. Ces symptômes s'accroissent au stade modéré d'évolution et s'accompagnent de difficultés à accomplir les activités de la vie quotidienne, à s'orienter, à suivre une conversation, etc. Enfin, au stade avancé, les atteintes cognitives sont sévères et affectent toutes les capacités de la personne. Sur le plan de la communication, les personnes affectées par la MA perdent peu à peu leur capacité à s'exprimer oralement et par écrit, à lire, ainsi qu'à comprendre ce qui leur est dit. Ces déficits

langagiers ont donc des impacts importants dans leur vie quotidienne et dans celle des membres de leur famille, de leurs proches et du personnel qui les soignent (Macoir, Turgeon et Laforce, 2015).

L'espérance de vie moyenne à la suite d'un diagnostic de MA est de 10 ans (Zanetti, Solerte et Cantoni, 2009). En raison de la nature dégénérative de la maladie, l'autonomie de la personne est progressivement compromise, allant jusqu'à un besoin de soins à temps plein. Selon les régions, plusieurs options de soins sont disponibles au Québec pour les personnes atteintes de la MA, dont l'aide à domicile, les centres d'hébergement de courte durée (répit) et les centres d'hébergement et de soins de longue durée (Société Alzheimer du Canada, 2007). Entre les premières manifestations de la maladie et la fin de la vie, de nombreuses personnes atteintes de la MA ont la chance de rester à la maison grâce aux soins et au soutien d'un de leurs proches, qui est souvent un membre de leur famille (Gaucher, Ribes et Darnaud, 2010). Cependant, ceci n'est pas sans conséquence pour celui qui prend en charge la responsabilité de s'occuper de la personne malade, puisque le rôle de proche aidant demande du temps et de l'énergie. Il peut être comparé à un travail à temps plein, car certains soins nécessitent la présence du proche aidant 24h sur 24 (Chenoweth et Spencer, 1986). Même si un lien d'attachement fort existe entre la personne malade et son proche aidant, cela n'empêche pas la plupart des proches aidants de ressentir les impacts néfastes de leur dévouement, aux niveaux émotionnel, physique et financier (Brodaty et Donkin, 2009). Le manque de répit, entre leur emploi et leur rôle de proche aidant auprès de la personne qui leur est chère, les rend notamment plus à risque de dépression et de surmenage (Joling et al., 2010; Molyneux, McCarthy, McEniff, Cryan et Conroy, 2008), ainsi que d'isolement social (Rodriguez et al., 2003). En somme, la réduction des loisirs, la diminution du nombre d'heures au travail et la détérioration de la santé physique et mentale font partie de l'expérience des proches aidants des personnes souffrant de démence et conduisent à l'épuisement chez une grande proportion d'entre eux (Etters, Goodall et Harrison, 2008). Plusieurs études ont porté sur les besoins des proches aidants des personnes souffrant de la MA (Soong, Au, Kyaw, Theng et Tudor Car, 2020; Whitlatch et Orsulic-Jeras, 2018). Dans la plupart d'entre elles, les auteurs rapportent que les proches aidants manifestent surtout le besoin de mieux connaître la maladie, d'acquérir des habiletés et des stratégies permettant de mieux communiquer au quotidien avec la personne malade et de faire face à ses problèmes comportementaux et cognitifs (Novais et al., 2018; Rosa et al., 2010).

Reconnaissant les besoins des personnes souffrant de la MA et de leurs proches, plusieurs organismes communautaires leur offrent du soutien. Au Canada, la Société Alzheimer est une ressource importante puisqu'elle offre des services par l'entremise de ses différentes sociétés locales dans les différentes provinces. Au Québec, 20 sociétés locales offrent des services dans les différentes régions, dont la Société Alzheimer de Québec (SA de Québec) qui dessert la population de la région de la Capitale-Nationale. Depuis 1985, cet organisme à but non lucratif offre des services aux personnes atteintes de la MA, ainsi qu'à leurs proches aidants et aux professionnels qui œuvrent auprès d'elles. Sa mission, à l'instar de celle de la Société Alzheimer du Canada, est d'améliorer la qualité de vie des personnes touchées par la MA ou une maladie apparentée, dans le respect et la dignité. Par le biais de rencontres individuelles ou de groupe, dans les bureaux de l'organisme ou par téléphone, la SA de Québec offre du soutien et de l'information, en plus de permettre la rencontre de personnes qui désirent échanger sur la maladie. L'organisme a également pour mission de former les professionnels et de sensibiliser la population à la MA et aux maladies qui y sont apparentées. Un centre de jour permet aux proches aidants d'avoir un répit et aux personnes atteintes de la maladie de socialiser et de se réaliser (Société Alzheimer de Québec, s.d.).

La méthodologie utilisée dans ce projet a tout d'abord permis d'identifier les besoins de la SA de Québec quant aux troubles de la communication associés à la MA et aux maladies qui y sont apparentées. Elle a aussi mené à la création de capsules vidéo destinées à combler en partie ces besoins. Dans les sections suivantes seront présentés la méthodologie utilisée et les résultats obtenus dans le projet. Suivra ensuite une discussion générale.

Méthodologie générale

Le projet est exempté de la nécessité d'obtenir une approbation éthique selon les politiques du Comité d'éthique de la recherche avec des êtres humains de l'Université Laval. En effet, il implique uniquement des interactions avec des personnes en vue d'obtenir des informations non personnelles, à titre d'utilisateurs ou de dispensateurs de services, ou encore, à titre d'experts.

La méthodologie adoptée dans ce projet est basée sur les principes de transfert et d'application des connaissances en santé (Straus, Tetroe et Graham, 2013). Elle comprend les trois étapes successives et inter-reliées suivantes : 1) identification des besoins de l'organisme et des proches aidants; 2) adaptation des connaissances au contexte local et identification des entraves et des facilitateurs; 3) mise en place effective du transfert

et de l'application des connaissances. De manière à faciliter la lecture de cet article, la méthodologie et les résultats obtenus pour chacune de ces étapes seront successivement présentés.

Étape 1. Identification des besoins

La première étape du processus de transfert et d'application des connaissances en santé consiste à identifier les besoins en cernant la problématique, en déterminant l'écart entre les connaissances et la réalité clinique et en identifiant les connaissances à transférer/appliquer (Straus et al., 2013).

Méthodologie. La première étape du projet a été réalisée au moyen de rencontres avec les acteurs principaux du domaine étudié, soit l'organisme communautaire et les proches aidants.

Besoin de l'organisme. Les porteurs du projet (première et deuxième auteure) ont effectué deux rencontres avec l'intervenant social et conseiller au programme d'aide de la SA de Québec. Lors de la première rencontre, l'intervenant social a expliqué le rôle de l'organisme et a détaillé l'ensemble des activités offertes aux proches aidants et aux personnes vivant avec la MA. Pour leur part, les porteurs du projet ont expliqué le rôle de l'orthophoniste dans l'évaluation et dans la prise en charge thérapeutique des troubles de la communication associés aux maladies neurodégénératives, ainsi que la portée générale de leur projet. La seconde rencontre a consisté en la sélection d'une stratégie d'identification des besoins de l'organisme quant aux troubles de la communication dans la MA.

Afin d'obtenir une idée précise des besoins de la SA de Québec, un questionnaire portant sur les difficultés de communication des personnes vivant avec la MA a été remis à des intervenants œuvrant au sein de l'organisme (voir l'annexe A). Les intervenants sont des partenaires clés dans la compréhension des difficultés principales et des besoins des personnes atteintes de la MA, puisqu'ils côtoient ces personnes et leurs proches quotidiennement. Dans le but de bien comprendre l'approche et les valeurs prônées par l'organisme, les porteurs du projet ont aussi passé deux journées au centre de jour l'Intemporel, un service de répit offert par la SA de Québec. Cette participation visait à mieux comprendre les défis de communication des personnes vivant avec la MA à ses différents stades d'évolution et à questionner les intervenants de vive voix dans le but de confirmer et bonifier les informations recueillies avec le questionnaire.

Besoins des proches aidants. Les besoins des proches aidants ont été identifiés au moyen d'un questionnaire portant sur les difficultés de communication présentes

chez les personnes souffrant de la MA, sur les stratégies de communication mises en place par le proche aidant et sur le soutien qu'il aurait souhaité avoir au plan de la communication (voir l'annexe B). Cinq des douze questions comprenaient une question supplémentaire permettant aux proches aidants de préciser leurs réponses et de donner des exemples.

Résultats. Quatre intervenants de la SA de Québec ont répondu au questionnaire envoyé par courriel. La compilation de leurs réponses fait essentiellement ressortir qu'ils se sentent en général suffisamment outillés pour intervenir auprès de leur clientèle. Leur formation et le soutien auquel ils ont accès dans l'exercice de leur profession leur semblent également adéquats pour remplir leurs fonctions. Selon deux intervenants, les besoins de l'entourage des personnes atteintes de la MA sont prioritaires par rapport à ceux des employés du milieu de la santé. Les deux autres ont mentionné qu'il serait important d'outiller à la fois les employés du milieu de la santé et les proches aidants quant aux problèmes liés aux troubles de la communication. Les intervenants ont également mentionné que les proches aidants leur manifestaient fréquemment le désir d'avoir plus d'informations sur les difficultés associées à la MA et qu'ils ne semblaient pas toujours bien comprendre la condition de leur proche. Selon eux, les ressources offertes aux proches aidants ne sont pas suffisantes ou suffisamment accessibles pour qu'ils puissent en tirer pleinement profit.

Seize questionnaires ont été complétés par des proches aidants. À la question «avez-vous de la difficulté à communiquer avec votre proche atteint de la MA?», la majorité d'entre eux ont répondu par l'affirmative. Tous ceux qui y ont répondu par la négative ont néanmoins identifié des difficultés de communication dans les questions subséquentes, démontrant ainsi l'importance de bien définir le concept de communication dans le cadre du projet. Parmi les exemples de difficultés citées par les proches aidants, on compte notamment la nécessité de devoir répéter plusieurs fois la même chose, les difficultés de compréhension, le manque de compréhension de la condition par la personne atteinte de la MA, la réduction ou l'impossibilité de tenir une conversation, l'anomie ou le laconisme, etc. La majorité des proches aidants ont également rapporté que les problèmes de communication généraient de la frustration chez eux et chez leur proche atteint de la MA et qu'ils avaient donc dû modifier leurs habitudes sociales en raison des difficultés communicationnelles de la personne. Quinze des seize proches aidants consultés ont affirmé souhaiter être mieux outillés pour pallier les difficultés de communication de leur proche atteint de la MA. La plupart ont déjà mis en place

des modifications dans leur communication et certaines stratégies qu'ils emploient leur semblent adéquates, telles que ne pas commenter le fait que la personne repose les mêmes questions à plusieurs reprises, parler de ce qui importe le plus à la personne, solliciter son attention et la regarder dans les yeux en lui parlant, etc. Cependant, d'autres stratégies rapportées semblent moins adéquates, comme celle de parler uniquement du quotidien et de diminuer la fréquence et la durée des conversations.

Conclusion. Malgré le nombre limité de répondants aux questionnaires, l'étape 1 a permis de déterminer qu'un projet visant à informer les proches aidants sur les difficultés de communication des personnes atteintes de la MA et sur les stratégies à privilégier pour maintenir le plus longtemps possible une communication satisfaisante était le plus pertinent pour répondre aux besoins de l'organisme et des proches aidants. Les données de la littérature concordent d'ailleurs avec cet objectif puisqu'elles font aussi ressortir l'importance de fournir aux proches aidants de l'information accessible pour les aider à comprendre la MA. Plusieurs études ont ainsi démontré qu'un des principaux besoins exprimés par les proches aidants est d'être informés sur la condition de leur proche pour savoir comment l'aider au mieux (Coudin et Mollard, 2011; De Rotrou et al., 2006; Hanson, Magnusson et Nolan, 2008; Lévesque et al., 2010). Selon Stoltz, Udén et Willman (2004), le fait d'être informé a un impact sur la perception de la maladie, ce qui favorise une meilleure gestion du stress, améliore la capacité à faire face aux difficultés et encourage l'utilisation de stratégies d'aide plus adaptées. D'autres études ont montré que pour se délester de leur stress et des autres émotions négatives entourant leur situation, les proches aidants avaient besoin d'être écoutés, accompagnés et informés sur la maladie (Gaucher et al., 2010). En les informant sur les difficultés associées à la maladie et sur les stratégies à privilégier, on les outille pour qu'ils adaptent leur quotidien en fonction des changements dans le fonctionnement de la personne atteinte de la MA. On leur offre également des opportunités de se sentir compétents et de réaliser qu'ils ne sont pas seuls à vivre cette situation (De Rotrou et al., 2006; Ducharme et al., 2009). Ainsi, le transfert et l'application des connaissances devraient faire partie de tout programme destiné à venir en aide aux proches aidants.

Étape 2. Adaptation des connaissances au contexte local et identification des entraves et des facilitateurs

Les connaissances relatives aux troubles de la communication dans la MA et dans les maladies neurodégénératives sont nombreuses (p. ex. Macoir et al., 2015). Celles portant sur les stratégies à privilégier pour maintenir une communication fonctionnelle et satisfaisante

le plus longtemps possible sont également bien établies et ont d'ailleurs récemment fait l'objet d'une recension critique de la littérature (Vachon, Veilleux et Macoir, 2017). C'est en s'appuyant sur ces données que les auteurs ont conçu l'étape 2 du projet, qui porte sur l'adaptation des connaissances au contexte local et sur l'identification des entraves et des facilitateurs.

Méthodologie. Le travail préparatoire au transfert et à l'application des connaissances a consisté en une validation externe des informations recueillies lors de l'étape 1, ainsi qu'en l'identification des entraves et des facilitateurs. Pour ce faire, trois orthophonistes cliniciennes œuvrant régulièrement auprès de personnes souffrant de troubles de la communication associés aux maladies neurodégénératives ont été consultées. Diverses questions leur ont été posées, portant principalement sur les difficultés rapportées par les proches aidants, la façon d'aborder les difficultés de communication avec la personne atteinte de la MA et leurs proches, les stratégies conseillées aux proches aidants pour améliorer la communication, la meilleure façon de communiquer avec une personne souffrant de la MA, les messages importants à transmettre à la personne atteinte de la MA et à ses proches sur le plan de la communication et les éléments à prendre en compte pour vulgariser les messages aux proches aidants.

Résultats. Les entrevues avec les trois orthophonistes ont permis de valider la plupart des données recueillies à l'étape 1 auprès des intervenants et des proches aidants. Cette validation nous conforte dans la représentativité des données recueillies auprès des intervenants et des proches, considérant le nombre limité de personnes ayant répondu aux questionnaires à l'étape 1. La nécessité de fournir des informations aux proches aidants sur la MA et ses impacts sur la communication est clairement ressortie de manière prioritaire. Selon les trois orthophonistes consultées, les plus grandes difficultés rapportées par les proches aidants sont la difficulté de la personne souffrant de la MA à tenir une conversation, son incapacité à détecter et réparer les bris de communication et ses difficultés de compréhension, qui entraînent des problèmes de comportement au quotidien et l'isolement de plus en plus grand du proche aidant. Les stratégies proposées dans la littérature pour favoriser une communication la plus fonctionnelle possible sont généralement efficaces, mais le défi est de les transmettre de manière simple et accessible aux proches aidants. Ces derniers ont besoin d'être écoutés, d'être reconnus et épaulés dans leur rôle et d'être outillés pour faire face aux nombreux défis qui se présentent à eux.

Sur le plan de l'identification des entraves et des facilitateurs au transfert et à l'application

des connaissances aux proches aidants, les trois orthophonistes cliniciennes ont mentionné l'importance d'aborder les éléments suivants : le maintien possible de la communication jusqu'à un stade avancé de la MA, malgré sa nature dégénérative, les impacts de la MA sur toutes les sphères de la communication et les stratégies à privilégier pour les réduire ou les compenser. Parmi les principales entraves relevées, on compte la complexité des problèmes de communication, la différenciation parfois difficile entre ces problèmes et les troubles de la mémoire qui sont généralement associés à la MA, la nature dégénérative de la maladie, ainsi que le « pessimisme » et la résignation qui entoure la MA. Parmi les facilitateurs évoqués, on note l'importance de fournir des exemples concrets des difficultés de communication rencontrées par les personnes atteintes de la MA, ainsi que des exemples de stratégies efficaces et inefficaces pour les réduire ou les compenser. La communication est au cœur de la vie d'une personne, il est donc assez facile d'illustrer les propos par des exemples concrets du quotidien.

La vulgarisation et la brièveté du message sont également soulignées comme facteurs facilitants par les intervenants de la SA de Québec et les orthophonistes consultées : les informations transmises doivent être synthétisées et simples à comprendre. Enfin, le moyen de communication est déterminant. Les dépliants peuvent être efficaces, mais les obtenir est parfois complexe. Ils sont de plus difficilement transférables d'une personne à l'autre et ne permettent de rejoindre qu'une petite part du « public cible ». Par comparaison, les capsules vidéo sont des outils simples et conviviaux pour le transfert de connaissances. Elles attirent l'attention et permettent de transmettre rapidement des informations et de les illustrer par des exemples vivants. Bien plus que les documents papier, les capsules vidéo permettent d'attirer l'attention de l'utilisateur et de favoriser sa mémorisation du contenu par la mise en scène, le tout en lui demandant peu d'efforts (Haskin, 2013). De plus, les capsules vidéo sont plus propices à être consultées par les utilisateurs et l'algorithme derrière diverses plateformes numériques (comme les réseaux sociaux) propulse davantage ce type de média dans les fils d'actualité de ses utilisateurs, comparativement aux images ou aux textes statiques (Panahi, Watson et Partridge, 2012). Finalement, les capsules vidéo permettent de transmettre du contenu dans un langage accessible, dont le niveau de formalité ne respecte pas nécessairement celui qui est requis à l'écrit. Ils permettent donc de rejoindre le plus grand nombre d'individus possible qui gravitent autour des personnes vivant avec la MA. Les trois orthophonistes cliniciennes ont aussi confirmé que selon elles, les capsules vidéo étaient le moyen de

communication le plus adapté pour transmettre ce type de message, en raison de la possibilité d'y inclure des éléments très visuels et concrets et de les diffuser largement.

Étape 3. Mise en place effective du transfert et de l'application des connaissances

L'étape 3 du projet a consisté en la sélection finale des cibles de transfert et d'application des connaissances, l'élaboration des scripts, le tournage et le montage des capsules vidéo et enfin leur diffusion.

Méthodologie. La sélection finale des cibles de transfert et d'application des connaissances s'est essentiellement basée sur les données de la littérature et sur les informations recueillies aux étapes 1 et 2 du projet. L'élaboration du script des capsules vidéo a été effectuée en utilisant un canevas standard spécifiant le synopsis (résumé du scénario), le contenu, la durée, les séquences (c.-à-d. les effets visuels, les acteurs, les effets sonores, la bande-son) et leur enchaînement. Le tournage et le montage des capsules vidéo ont été suivis des premières étapes visant leur diffusion au public cible.

Résultats. Les trois difficultés de communication sélectionnées pour ce projet correspondent à celles qui sont les plus souvent rencontrées dans la progression de la MA, selon la littérature et les orthophonistes consultées. Il s'agit des difficultés à trouver ses mots, à comprendre le langage et à participer à une conversation. Selon les cliniciennes rencontrées et les intervenants de la SA de Québec, ces difficultés peuvent être mal interprétées par les proches, car leurs manifestations peuvent parfois ressembler à du désintérêt, à de la mauvaise volonté ou à de l'opposition. Selon la littérature scientifique (pour une recension, voir Vachon et al., 2017), les stratégies simples suivantes peuvent être appliquées par les proches aidants et sont efficaces pour minimiser l'impact des problèmes de communication associés à la MA ou pour les compenser : laisser du temps à la personne atteinte de la MA pour qu'elle puisse s'exprimer, l'encourager à utiliser un synonyme lorsqu'elle ne trouve pas le mot ou à en donner une définition, l'encourager à utiliser des gestes ou des objets de l'environnement pour s'exprimer, nommer son incompréhension plutôt que de faire semblant de comprendre ce qu'elle veut transmettre, clarifier le sujet de conversation, solliciter l'attention de la personne atteinte de la MA avant de lui parler, utiliser des phrases courtes et simples, limiter les distracteurs de l'environnement, utiliser des questions à choix fermés lorsqu'on cherche à obtenir une réponse claire, utiliser des mots et des formulations concrètes et soutenir la compréhension en utilisant des gestes et des objets de l'environnement.

L'élaboration des scripts, le tournage (qui a consisté en deux séances de tournage et une séance d'enregistrement des voix hors champ) et le montage des 4 capsules vidéo d'une durée approximative de 4 minutes (c.-à-d. 3 min 5 s, 3 min 28 s, 4 min 3 s et 4 min 20 s) ont été réalisés par les porteurs du projet et un technicien de la Direction de l'intégration des technologies de l'information de la Faculté de médecine de l'Université Laval.

La première capsule est une introduction générale dans laquelle sont fournies des explications sur la MA et sur les troubles de la communication qui y sont associés (<https://www.youtube.com/watch?v=txOdPBhIVFs>). Les trois autres capsules peuvent être visionnées sans ordre préétabli. L'une d'elles porte sur les difficultés de la personne atteinte de la MA à trouver ses mots en mémoire (<https://www.youtube.com/watch?v=1j2By1sTB1I>), une autre porte sur les difficultés de compréhension du langage associées à la MA (<https://www.youtube.com/watch?v=UgtOyfu3r5Y>) et la dernière porte sur les difficultés des personnes souffrant de la MA à participer à une conversation (<https://www.youtube.com/watch?v=stArOWizgaM>).

La structure générale suivante a été utilisée dans les trois capsules décrites précédemment, portant sur les difficultés spécifiques de communication dans la MA. Une difficulté de communication susceptible de se manifester dans la MA est d'abord exposée, suivie d'une explication sommaire de sa cause. Des exemples concrets de manifestations de cette difficulté dans le quotidien des personnes atteintes de la MA sont ensuite présentés. Enfin, quelques stratégies, illustrées au moyen d'exemples, sont proposées aux proches aidants pour soutenir la personne atteinte de la MA et ainsi limiter les impacts de la difficulté dans leurs échanges. Un texte à l'écran accompagne la présentation orale des stratégies, de manière à aider les proches aidants à les mémoriser. Certaines capsules contiennent également des extraits de mises en situation muettes, dans lesquelles on voit des personnes âgées en interaction avec des membres de leur famille. Ces mises en situation appuient la nécessité de mettre en place des stratégies facilitant la communication et en illustrent leur application. Ces images contribuent à rendre les capsules vidéo plus dynamiques et à permettre aux proches aidants de s'identifier aux situations présentées.

La diffusion des quatre capsules vidéo a d'abord été effectuée via la chaîne YouTube de la Faculté de médecine de l'Université Laval (<https://www.youtube.com/user/webmestrefmed>). Des liens vers les quatre capsules vidéo (disponibles sur YouTube) ont également été inclus sur le site Internet de la SA de Québec (<https://www.societealzheimerdequebec.com/nos-services/centre-de->

documentation/) où elles sont partagées à l'ensemble des membres de l'organisme et des partenaires associés (p. ex. autres SA régionales du Québec, Centre d'excellence sur le vieillissement de Québec, Centre d'hébergement et de soins de longue durée). Les capsules vidéo seront aussi utilisées dans les séances de formation aux intervenants, dans les journées de sensibilisation à la MA, etc. Des copies numériques des quatre capsules ont également été gravées sur des disques compacts et ont été placées dans la bibliothèque de la SA de Québec pour pouvoir y être visionnées sur place.

Discussion générale

L'objectif général de ce projet, basé sur les principes généraux de transfert et d'application des connaissances en santé (Straus et al., 2013), était de répondre aux besoins des proches aidants des personnes atteintes de la MA d'être mieux informés sur la maladie et d'être mieux outillés pour faire face aux troubles de la communication qui y sont associés. Les ressources offertes aux proches aidants dans la province de Québec sont insuffisantes pour répondre à ces besoins. Il existe également un manque flagrant d'informations vulgarisées portant sur le lien entre l'évolution de la maladie et l'accroissement des difficultés de communication vécues au quotidien. La communication est un besoin fondamental et il importe de la favoriser jusqu'à la fin de la vie, pour permettre à toute personne d'exprimer ses besoins, de participer aux décisions qui la concernent et de maintenir des relations interpersonnelles et affectives satisfaisantes. En collaboration avec la SA de Québec et la Faculté de médecine de l'Université Laval, une série de quatre courtes capsules vidéo ont été réalisées dans lesquelles sont expliquées les difficultés de communication susceptibles de survenir dans le décours de la MA maladie et sont proposées des stratégies pour favoriser et maintenir une communication satisfaisante.

Les quatre capsules vidéo fournissent des informations sur la MA et sur les difficultés communicationnelles qu'elle est susceptible d'entraîner, présentées dans un langage simple et accessible. Au moyen d'exemples précis, elles proposent également des stratégies concrètes destinées à compenser ou à réduire l'impact de la MA sur la communication fonctionnelle. Alors que des formations offertes aux proches aidants sont dispensées dans les grandes villes du Québec, ces capsules vidéo ont l'avantage d'être accessibles aux proches aidants francophones de toutes les régions du Québec et de partout dans le monde. Leur consultation est gratuite, ce qui permet aux proches aidants de les regarder à plusieurs reprises et de les partager avec les autres membres de l'entourage de la personne atteinte de la MA, ainsi qu'à toutes les personnes

susceptibles d'être intéressées et concernées. Puisqu'elles peuvent être consultées directement à la maison, cela permet également au proche aidant de faire des essais de stratégies, puis d'en confirmer ou peaufiner l'application en retournant visionner les capsules.

Les auteurs espèrent vivement que les capsules vidéo développées dans le cadre du projet trouveront leur place dans l'ensemble de la documentation disponible sur Internet pour les proches aidants de personnes atteintes de maladies neurodégénératives. Leur contenu se distingue des autres publications par trois principales raisons. Premièrement, le fait que les difficultés de communication y soient expliquées, notamment en ce qui a trait à leur origine et à leurs manifestations au quotidien, permet de répondre au besoin d'information des proches aidants. Tel que mentionné en introduction, les proches aidants expriment le fait qu'ils se sentiraient plus à l'aise dans leur rôle s'ils comprenaient mieux la condition de la personne atteinte de la MA. Deuxièmement, des stratégies précises y sont proposées et expliquées, en lien avec les difficultés de communication. Troisièmement, les difficultés typiques de la MA ne sont pas présentées selon les stades d'évolution de la maladie mais indépendamment les unes des autres et sont appuyées d'exemples concrets. Cela permet ainsi aux proches aidants de se baser sur le comportement de la personne atteinte de la MA plutôt que de tenir pour acquis que telle difficulté devrait se présenter à tel stade et que par conséquent, telle stratégie devrait être appliquée. Cette approche permet une vision plus holistique et personnelle de la condition de la personne souffrant de la MA. Elle favorise également une meilleure compréhension des difficultés que présente une personne atteinte de la MA et une application plus adaptée des stratégies par les proches aidants.

À plus grande échelle, les auteurs espèrent que leur projet contribuera à faire connaître les difficultés de communication associées à la MA et à outiller les proches aidants. L'utilisation efficace des stratégies par les proches aidants pourrait améliorer la qualité de vie des personnes touchées par la MA, mission dont s'est dotée la SA de Québec. Un questionnaire d'appréciation des capsules vidéo sera bientôt accessible en ligne sur le site Internet de l'organisme et devrait fournir une rétroaction intéressante sur leur utilité et leur pertinence. Enfin, en raison de la diffusion à grande échelle visée, les capsules vidéo ont aussi le potentiel d'accroître la connaissance du rôle de l'orthophoniste auprès des personnes ayant une maladie neurodégénérative. Dans ce contexte, comme auprès de toute personne présentant une difficulté de communication, « les interventions de l'orthophoniste

ont pour but de développer, restaurer ou maintenir la capacité de communiquer de la personne et à favoriser son autonomie et son intégration dans les activités familiales, scolaires, professionnelles et sociales» (Ordre des orthophonistes et audiologistes du Québec, 2012). Ainsi, ce projet contribue à la promotion et au rayonnement de la profession d'orthophoniste.

Afin de soutenir davantage la communication entre les proches aidants et les personnes atteintes de la MA, il pourrait être intéressant d'offrir des formations sur les stratégies de communication, animées par un orthophoniste. L'efficacité de telles formations a d'ailleurs été démontrée à plusieurs reprises dans la littérature (p. ex. Haberstroh, Neumeyer, Krause, Franzmann et Pantel, 2011; Ripich, Zioli, Fritsch et Durand, 2000). En petits groupes, les aidants pourraient partager leur vécu et les stratégies qu'ils utilisent, et ainsi, sortir de l'isolement qu'entraînent les difficultés de communication vécues par leur proche. Le professionnel pourrait accompagner les proches aidants dans la résolution des problèmes qui surviennent dans leur quotidien. En effet, les bris de communication fréquents et les changements dans la dynamique des échanges peuvent occasionner des obstacles dans la relation interpersonnelle privilégiée entre le proche aidant et la personne atteinte de la MA. L'orthophoniste pourrait également effectuer de l'accompagnement directement dans le milieu de vie, afin de bien explorer le vécu du proche aidant, proposer des stratégies de communication personnalisées et adaptées à sa réalité et en optimiser la mise en application. Finalement, il serait pertinent de former davantage les intervenants (p. ex. infirmiers, préposés aux bénéficiaires, médecins) des différents milieux fréquentés par les personnes souffrant de la MA ou leurs proches, afin qu'ils agissent à titre d'agents multiplicateurs et qu'ils soient davantage en mesure d'adapter leurs actions, d'outiller les proches aidants au moyen de stratégies générales montrées efficaces et de les référer au besoin vers les ressources appropriées.

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Note des auteurs

Les demandes au sujet de cet article doivent être adressées à Joël Macoir, Département de réadaptation, Faculté de médecine, Université Laval, Pavillon Ferdinand-Vandry, 1050 avenue de la Médecine, Québec, QC, Canada, G1V 0A6. Courriel : joel.macoir@fmed.ulaval.ca

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Déclaration

Les auteurs déclarent n'avoir aucun conflit d'intérêts, financiers ou autres.

Annexe A**Questionnaire utilisé pour recueillir les besoins de la Société Alzheimer de Québec**

1. Selon vous, quel est le plus grand défi des personnes atteintes de la maladie d'Alzheimer au niveau de la communication? Quel serait le plus grand défi d'un professionnel qui intervient auprès de ces personnes?
2. Selon vous, quelles sont les principales difficultés de communication des personnes vivant avec la maladie d'Alzheimer (par exemple, au niveau de la compréhension, de l'expression de leurs besoins ou émotions, etc.)?
3. Est-ce que les proches aidants vous rapportent de telles difficultés?
4. Vous sentez-vous outillés pour pallier ces difficultés, que ce soit par des outils d'aide à la communication, des formations vous permettant de développer ces compétences, du soutien interprofessionnel, etc.?
 Oui, je me sens parfaitement à l'aise dans toutes les situations.
 Oui, mais il m'arrive de ne pas savoir comment intervenir. Dans quelles situations?
 Non, j'apprécierais être mieux outillé de manière générale.
5. Qu'est-ce qui pourrait vous aider dans votre rôle d'intervenant?
6. Qu'est-ce qui pourrait vous aider en soutien aux proches aidants?
7. Si nous souhaitions donner de l'information sur la communication avec les personnes vivant avec la maladie d'Alzheimer, quel groupe serait prioritaire selon vous?
 Les proches aidants.
 Les professionnels de la santé et des services sociaux (svp, précisez profession et type de milieu, s'il y a lieu).

 Les intervenants communautaires.
 Les citoyens de manière générale (sensibilisation).
 Autres (précisez). _____
8. Quelle serait, selon vous, la meilleure approche pour outiller ces personnes?


Autres suggestions?


Merci pour votre précieuse collaboration.

Annexe B
Questionnaire utilisé pour recueillir les besoins des proches aidants

Tableau B1			
Identification des problèmes de communication			
	Oui	Non	Je ne sais pas
Avez-vous de la difficulté à communiquer avec votre proche?			
Indiquez des exemples de difficultés, si désiré (ce qui limite/entrave la discussion).			
Votre proche a-t-il de la difficulté à participer à une conversation en groupe (plus de 2 personnes)?			
Votre proche semble-t-il avoir de la difficulté à vous comprendre? (Exemple : lorsque vous discutez avec lui ou lui posez une question)			
Votre proche a-t-il de la difficulté à trouver ses mots?			
Avez-vous de la difficulté à comprendre ce que votre proche exprime?			
Votre proche semble-t-il ressentir un inconfort ou de la frustration en raison de difficultés à communiquer?			
Ressentez-vous de la frustration en raison de difficultés à communiquer avec votre proche?			
Avez-vous modifié vos habitudes par rapport à vos activités sociales en raison des difficultés de communication de votre proche?			

Tableau B2			
Stratégies de communication employées			
	Oui	Non	Je ne sais pas
Avez-vous modifié la façon de communiquer avec votre proche depuis le début de la maladie?			
Si oui, précisez de quelle façon, si désiré.			
Utilisez-vous déjà des stratégies pour mieux communiquer avec votre proche?			
Si oui, lesquelles?			
Avez-vous fait des recherches sur les stratégies de communication à employer avec les personnes atteintes de la maladie d'Alzheimer?			
Si oui, où, auprès de qui?			
Aimeriez-vous être mieux outillés pour communiquer avec votre proche?			
Si oui, précisez de quelle façon, si désiré.			

 **Implementing Evidence-Based Assessment Practices for the Monitoring of Spoken Language Outcomes in Children who are Deaf or Hard of Hearing in a Large Community Program**

 **Intégrer des pratiques d'évaluation fondées sur les données probantes aux protocoles qui servent à faire le suivi du développement des habiletés de langage oral des enfants sourds ou malentendants dans un programme communautaire de grande envergure**

KEYWORDS
IMPLEMENTATION
ASSESSMENT
INTEGRATED KNOWLEDGE TRANSLATION
OUTCOME MONITORING
SPEECH-LANGUAGE PATHOLOGY

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Abstract

The purpose of this quality improvement pilot was to evaluate the effectiveness of an online learning module for (a) changing speech-language pathologists’ perceptions about outcome monitoring and assessment protocols for children who are deaf or hard of hearing and (b) supporting speech-language pathologists’ understanding of evidence-based protocols to be implemented in their community-based program. Using principles of integrated knowledge translation and the Ottawa Model of Research Use, an online learning module was designed to support the implementation of evidence-based assessment protocols for these children in a large publicly funded program in Ontario, Canada. A pre–post study was then conducted with 56 speech-language pathologists (56/73 who were invited, 77% response rate) who took a pre-module survey, completed the online learning module, and then immediately took a post-module survey. After completing the learning module, speech-language pathologists reported improved perceptions about outcome monitoring, good understanding of the procedures to be implemented, and intentions to implement the new procedures into practice. Implementation materials were rated as highly valuable. Online learning modules can be used to effectively translate evidence-based assessment procedures to speech-language pathologists. Developing interventions using theory and in collaboration with stakeholders can support the implementation of these types of procedures into practice.

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 Paola Colozzo
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 David H. McFarland

Abrégé

L'objectif du présent projet pilote d'amélioration de la qualité était d'évaluer l'efficacité d'un module d'apprentissage en ligne pour (a) changer la perception des orthophonistes à propos des protocoles de suivi et d'évaluation utilisés avec les enfants sourds ou malentendants et (b) aider les orthophonistes à comprendre les protocoles fondés sur les données probantes qui seront intégrés au programme communautaire dans lequel ils travaillent. En utilisant les principes de transfert des connaissances intégrés et le modèle d'utilisation de la recherche d'Ottawa, un module d'apprentissage en ligne a été conçu pour soutenir l'intégration de protocoles d'évaluation fondés sur les données probantes auprès d'enfants sourds ou malentendants dans un programme de grande envergure financé par le gouvernement de l'Ontario, au Canada. Une étude pré-post a ensuite été réalisée auprès de 56 orthophonistes (56 des 73 orthophonistes qui ont été invités ont pris part à l'étude, ce qui donne un taux de réponse de 77%). Ceux-ci ont d'abord répondu à un questionnaire, ils ont ensuite complété le module d'apprentissage en ligne, puis ils ont répondu à un deuxième questionnaire (immédiatement après avoir complété le module). Après avoir terminé le module d'apprentissage, la perception des orthophonistes concernant le suivi du développement des habiletés était meilleure et les orthophonistes rapportaient avoir une bonne compréhension des procédures qui seront intégrées et des intentions derrière l'intégration des nouvelles pratiques. Le matériel supportant l'intégration a été jugé comme étant très utile. Des modules d'apprentissage en ligne peuvent donc être utilisés pour traduire efficacement aux orthophonistes des procédures d'évaluation fondées sur les données probantes. Développer des interventions en utilisant la théorie et en collaborant avec les acteurs principaux peut soutenir l'intégration de ce type de procédures fondées sur les données probantes dans la pratique.

This paper describes how principles of integrated knowledge translation and the Ottawa Model of Research Use were used to develop materials and methods for implementing evidence-based assessment procedures in a large community-based program (Ontario, Canada's Infant Hearing Program [IHP]) and how speech-language pathologists' (S-LPs) perceptions changed following their participation in a quality improvement pilot study to evaluate the impact of those implementation efforts.

Background

The IHP is a branch of the Ontario Ministry of Children, Community and Social Services in Ontario, Canada. The program provides family-centered Early Hearing Detection and Intervention services. Its policies and procedures are informed by the Joint Committee on Infant Hearing best practice recommendations (Joint Committee on Infant Hearing, 2007; Joint Committee on Infant Hearing et al., 2013) and international Early Hearing Detection and Intervention consensus statements (Moeller, Carr, Seaver, Stredler-Brown, & Holzinger, 2013). Broadly, the IHP supports families through the provision of universal newborn hearing screening, continued monitoring of babies at risk of developing childhood hearing loss, follow-up audiological assessment and services, provision of amplification technologies (i.e., hearing aids), and spoken or signed language development services (as decided by the family) for children who are deaf or hard of hearing from birth until 6 years of age. S-LPs working to support spoken language development in this program provide assessment, consultation, and intervention services for over 900 children who are deaf or hard of hearing each year (Ontario Ministry of Children, Community and Social Services, personal communication, July 20, 2018).

For families who choose for their child to learn spoken language, the IHP recognizes the benefit of routine assessment of children's spoken language skills (Joint Committee on Infant Hearing, 2007). Since 2009, S-LPs working in the IHP have been required to complete both the auditory comprehension and expressive language scales from the Preschool Language Scales (4th ed.; PLS-4; Zimmerman, Steiner, & Pond, 2002) for all children every 6 months for the duration of their time accessing services. Informally, S-LPs reported a lack of appreciation for the outcome monitoring program. They reported not understanding the need for program-level outcome monitoring, how or why the data they submitted were used, and concerns that regularly scheduled assessments meant time lost from direct intervention. S-LPs had also identified concerns with the choice of measurement tool based in part on a blog post that had been circulated that portrayed the Preschool Language Scales as invalid ([https://](https://community.asha.org/blogs/kristin-smith/2014/10/28/pls-5)

community.asha.org/blogs/kristin-smith/2014/10/28/pls-5). In part, these challenges led to inconsistent understanding and application of outcome monitoring procedures and irregular submission of outcomes data (Daub, 2016).

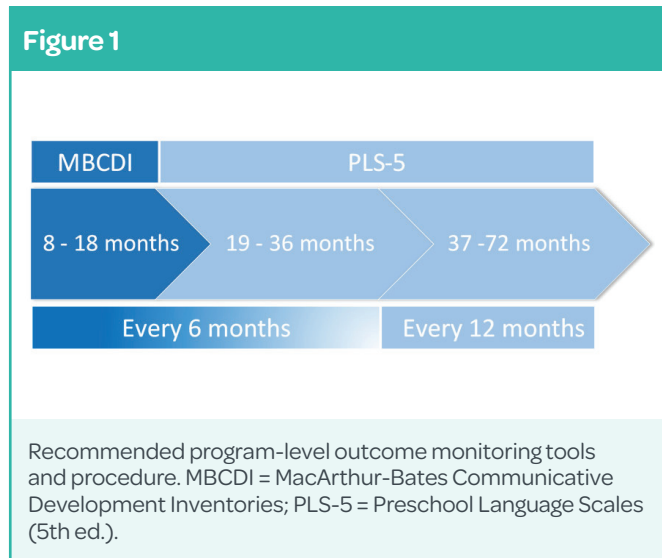
Collaborating to Improve Outcome Monitoring

A newer version of the Preschool Language Scales was developed in 2011, the Preschool Language Scales, Fifth Edition (PLS-5; Zimmerman, Steiner, & Pond, 2011). This, together with S-LPs' concerns, prompted the IHP to review their program level outcome monitoring procedures to determine whether the Preschool Language Scales was still the best tool for measuring spoken language outcomes in children who are deaf or hard of hearing.

Our research team was approached to support the review of procedures and asked to conduct an independent review of the literature to (a) identify the best tools for measuring spoken language outcomes in the IHP and (b) make recommendations about spoken language outcome monitoring procedures for the program. The review included a systematic search of three databases (i.e., CINAHL, Pubmed, and Scopus) to identify studies published in English between 1990 and 2016 that included children who wore hearing aids (Oram Cardy & Daub, 2017). Twenty-two tests that had been used with children who are deaf or hard of hearing between birth and 6 years of age were identified. The 22 tests were then evaluated and compared for basic (publication year, time to administer, format, skills tested, age range covered) and psychometric (sensitivity, specificity, diagnostic accuracy, reliability, validity) properties. Evidence was weighted for each test to generate an overall determination of whether it was effective in identifying disorders and detecting change in children who are deaf or hard of hearing, and an overall conclusion for appropriateness for use in the IHP was made (Oram Cardy & Daub, 2017). Based on this analysis, the PLS-5 was identified as the best tool for measuring program level spoken language outcomes due to its psychometric properties and because it provides norm-referenced scores for all ages (birth to 6;0 years) of children the IHP serves (Oram Cardy & Daub, 2017).

The literature review supported clinical use of the PLS-5 for children who are deaf or hard of hearing right from birth; however, S-LPs identified clinical concerns with using the PLS-5 with the IHP's youngest children (i.e., those under 18 months of age). Further review of the literature supported the use of the MacArthur-Bates Communicative Development Inventories – Words and Gestures (2nd ed.; MBCDI; Fenson et al., 2007) as the best alternative for evaluating spoken language outcomes for children up to 18 months of age (Oram Cardy & Daub,

2017). In accordance with the Joint Committee on Infant Hearing recommendations, we recommended that S-LPs test all children who are deaf or hard of hearing with the MBCDI (up to 18 months) or the PLS-5 (19 months and older) every 6 months during the first 3 years of life and every year thereafter until 6 years of age (Figure 1). This was recommended regardless of whether children's skills were found to be within normal limits after testing and would allow the IHP to compare spoken language scores to normative data for same-aged children with typical hearing.



In addition to increased risk for delays in overall spoken language development, children who are deaf or hard of hearing are also at increased risk for delays in specific areas of speech and language (i.e., aspects of vocalization/articulation, vocabulary, grammar, and early literacy) even when they score within age expectations on broadly focused tools like the PLS-5 (Moeller, Hoover et al., 2007; Moeller, Tomblin, Yoshinaga-Itano, Connor, & Jerger, 2007; Oram Cardy & Daub, 2017). As such, we also recommended that S-LPs monitor children's skills in these specific areas to ensure the IHP would identify children in need of support who may not be identified through program-level outcome monitoring. A restricted set of standardized tests were recommended based on review of the literature as well as clinical and research expertise. The tests were selected to monitor skills specific to (a) articulation, (b) vocabulary and use of grammar, and (c) emergent literacy and phonological awareness at regular intervals (Table 1). Early vocal development and babbling were also domains identified as key vulnerabilities, but our literature review identified no tools for this purpose that were commercially available, clinically feasible, and psychometrically sound (Oram Cardy & Daub, 2017). We are currently working to validate a tool that can be used in the IHP to monitor early vocal development.

Our research team was next tasked with developing methods and materials to implement program-level outcome monitoring and individual vulnerability testing assessment procedures into practice in the IHP. Using an integrated knowledge translation approach, research should be of direct relevance to stakeholders and knowledge users and should find solutions to problems that can be applied in real-world clinical settings (Graham, Tetroe, & Maclean, 2014). We collaborated with policy makers, managers, and S-LPs to develop an online learning module that would provide S-LPs with the knowledge and skills required to complete program-level outcome monitoring and individual vulnerability testing. We worked to ensure the materials and information presented in our online module were directly linked to clinical practice (Olswang & Prelock, 2015). Specific methods for ensuring clinical relevance and value were developed through discussion with stakeholders (i.e., policy makers, managers, and S-LPs), based on our own clinical experience working in the program, and by applying concepts from the Ottawa Model of Research Use (Logan & Graham, 1998) to identify and address known barriers and facilitators to implementation. The format and content of the online learning module (including implementation materials) were designed to address barriers and highlight supports. Integrated knowledge translation is believed to increase the relevance, applicability, and impact of research, and may help to close the well-documented research-to-practice gap because stakeholders (e.g., government, management) and knowledge users (e.g., S-LPs) are collaborators throughout the research process (Graham, Kothari, McCutcheon, & the Integrated Knowledge Translation Research Project Leads, 2018; Olswang & Prelock, 2015).

The online learning module was primarily designed to provide information about program-level outcome monitoring; however, it also provided information about assessment for individual vulnerability testing for a subgroup of S-LPs who agreed to test this assessment procedure as well. Prior to implementing the new program-level outcome monitoring and individual vulnerability testing procedures across the IHP, it was agreed that both procedures should be tested at select sites in a quality improvement pilot study so that results could support the team in further improving materials (if necessary) prior to provincial implementation (Olswang & Prelock, 2015). The research team designed the pilot study methods, with input about feasibility and timing from policy makers and managers.

Study Aims

The aims of this study were to (a) confirm S-LPs' understanding of and perceptions about program-level

Table 1 Key Areas of Vulnerability and Recommended Assessment Tools and Schedule for Individual Outcome Monitoring		
Areas of vulnerability	Recommended assessment tools	Developmental stage
Vocalization/babbling/articulation	Test to be identified	< 30 months
	Goldman Fristoe Test of Articulation – Sounds in Words subtest (3rd ed.; Goldman & Fristoe, 2015)	30 months and older
Vocabulary and syntax	MacArthur-Bates Communicative Development Inventories, Words and Gestures – Words produced (2nd ed.; Fenson et al., 2007)*	8 to 18 months
	MacArthur-Bates Communicative Development Inventories, Words and Sentences – Words produced (2nd ed.; Fenson et al., 2007)	19 to 30 months
	Expressive One Word Picture Vocabulary Test (4th ed.; Martin & Brownell, 2010)	2 to 3 years
	Clinical Evaluation of Language Fundamentals Preschool – Word Structure subtest (2nd ed.; Wiig, Secord, & Semel, 2004)	3 to 6 years
	Comprehensive Assessment of Spoken Language Preschool – Grammatical Morphemes subtest (2nd ed.; Carrow-Woolfolk, 2016)	3 to 6 years
Emergent literacy and phonological awareness	Clinical Evaluation of Language Fundamentals Preschool – Pre-literacy rating scale (2nd ed.; Wiig, Secord, & Semel, 2004)	4 to 6 years
	Clinical Evaluation of Language Fundamentals Preschool – Phonological Awareness subtest (2nd ed.; Wiig, Secord, & Semel, 2004)	4 to 6 years

Note. *The MacArthur-Bates Words and Gestures was also recommended for program-level outcome monitoring.

monitoring procedures prior to completing an online learning module; (b) document our efforts to use principles of integrated knowledge translation and a theoretical framework to develop an online learning module to translate evidence-based assessment procedures to S-LPs working in the IHP; and (c) determine whether S-LPs’ perceptions about regular assessment and outcome monitoring, understanding about the procedures to be implemented, and intentions to implement changed after completing the online learning module. We anticipate that findings will be useful to the broader research community interested in using integrated knowledge translation to implement evidence-based procedures into practice. We also expect our findings will be useful to other programs considering implementing or modifying outcome monitoring procedures.

Using Theory to Support Implementation

The Ottawa Model of Research Use (Graham & Logan, 2004; Logan & Graham, 1998) was derived from theories of change and developed for policy makers and researchers wanting to implement health research evidence into practice and policy. This model informed our implementation materials and online intervention. It is interactive and has six

key interconnected elements that address the process by which research is adopted: (a) the practice environment, (b) potential adopters, (c) the evidence-based innovation, (d) transfer strategies, (e) adoption, and (f) outcomes.

During the development of interventions and throughout the implementation process, barriers are assessed to identify factors that are likely to support or hinder the uptake of evidence. These barriers are assessed within three elements of the Ottawa Model of Research Use: the practice environment, potential adopters, and evidence-based innovation. A description of these three elements follows.

The practice environment. The practice environment can facilitate or inhibit the adoption of new policies and procedures into practice. Factors affecting adoption can be structural, social, or patient-related. Structural factors include an organization’s decision-making structure; rules, regulations, and policies; resources and supplies; system of incentives; and required workload. Social factors include organizational politics, personalities, the presence of local advocates, and the culture of an organization. Patients may encourage or discourage adoption through their interest and/or willingness to participate (Logan & Graham, 1998).

Potential adopters. Potential adopters of evidence-based information may include patients, S-LPs, administrators, or policy makers. In this study, the potential adopters were S-LPs. Using the Ottawa Model of Research Use, barriers and supports that may influence the uptake of new evidence were assessed for S-LPs' knowledge about the new procedures, attitudes about implementation, and skills to implement the procedures (Logan & Graham, 1998).

The evidence-based innovation. The evidence-based innovation is evaluated for the ways in which potential adopters perceive it (i.e., the process by which the recommended procedures were developed) and for its actual content (e.g., the assessment procedures themselves). Using the Ottawa Model of Research Use, researchers should identify components of the innovation that are likely to be perceived positively/negatively ahead of time. They can use this knowledge to proactively develop implementation materials that address things that will be perceived negatively and emphasize those things predicted to be perceived positively (Logan & Graham, 1998). Specific attributes that may positively influence adoption include involving credible developers; inviting adopters to

participate in the process; using an explicit and transparent method of implementation; conducting a rigorous literature search and using objective methods for synthesizing evidence; ensuring the innovation is compatible with, yet more advantageous than, current practice; and developing an innovation that is easy to trial and seemingly easy to implement. Other factors that may influence adoption include the risk-benefit ratio for patients, ethical considerations, conflicting evidence or practice guidelines, and whether the innovation appears user-friendly and attractive (Logan & Graham, 1998).

We considered each element in the conceptualization of our implementation materials and methods. We made predictions about supports and barriers within each element based on our own experiences working in the program and through discussion with stakeholders (i.e., policy makers, managers, and S-LPs), and developed specific actions to address barriers or emphasize supports in our implementation materials and methods. Identified supports, barriers, and actions to address barriers are presented in **Table 2**.

Component	Barriers	Supports	Actions
Practice environment			
Structural	<ul style="list-style-type: none"> S-LPs faced large caseloads, high workload, limited resources, and long waiting lists for intervention. 	<ul style="list-style-type: none"> The new outcome monitoring procedure was mandated policy. 	<ul style="list-style-type: none"> S-LPs were granted time release from clinical duties by local leaders (e.g., a manager) to review implementation materials and complete surveys.
Social	<ul style="list-style-type: none"> There was a prevailing culture of limited appreciation for the relevance and importance of mandated outcome measurement tools and schedules. S-LPs may have viewed regular outcome measurement as time lost for intervention. 	<ul style="list-style-type: none"> Program leaders and S-LPs were included in the development of the recommendations and intervention materials. 	<ul style="list-style-type: none"> Persuasive messaging about the benefits of regular outcome monitoring was provided for S-LPs throughout the executive summary and webinar. Reports from the Joint Committee on Infant Hearing were included as implementation materials to provide additional evidence for the importance of regular outcome monitoring for children with hearing loss. A peer-reviewed research paper that analyzed data collected in the IHP was included as evidence of the value of outcome monitoring.

Table 2 (Continued)

Component	Barriers	Supports	Actions
Potential adopters			
Knowledge	<ul style="list-style-type: none"> S-LPs had no knowledge of the recommended changes. 	<ul style="list-style-type: none"> The recommended program-level procedure was similar to current practice. Each of the recommended outcome monitoring tools were likely familiar to S-LPs. S-LPs were skilled assessors and were familiar with the concept of regular outcome monitoring. 	<ul style="list-style-type: none"> The purpose and methods for the new procedure were clearly outlined in the webinar. Prior to the pilot, a select group of S-LPs reviewed the webinar prior to implementation to ensure messaging was clear and relevant to the practice context. S-LPs were provided with implementation materials designed to increase their knowledge of the new outcome monitoring procedures. Materials included (a) a desk reference that displayed the timing of program-level outcome monitoring assessments and tools to be used at each assessment and (b) detailed instructions for administering the MBCDI. S-LPs who were also piloting individual vulnerability testing received a second desk reference that displayed the timing of assessments and tools to be used.
Attitudes	<ul style="list-style-type: none"> S-LPs reported having limited appreciation for the relevance and importance of mandated outcome measurement tools and schedules. S-LPs may have viewed regular outcome measurement as time lost from intervention. 	<ul style="list-style-type: none"> S-LPs wanted the best possible outcome for children and families they served and were motivated to use evidence-based procedures to help them. The new outcome monitoring procedure was mandated policy. 	<ul style="list-style-type: none"> Persuasive messaging about the benefits of regular outcome monitoring was provided for S-LPs throughout the executive summary and webinar. Reports from the Joint Committee on Infant Hearing were included as implementation materials to provide additional evidence for the importance of regular outcome monitoring for children with hearing loss.
Skills	<ul style="list-style-type: none"> S-LPs may have been unfamiliar with the PLS-5 and may not have had experience using growth scale values. S-LPs may not have been familiar with all the recommended assessment tools. S-LPs have had no or limited previous experience with online data reporting. 	<ul style="list-style-type: none"> S-LPs had experience using the PLS-4 (similar to the PLS-5) and many of the other recommended tools. 	<ul style="list-style-type: none"> S-LPs were given a document that explained the transition from PLS-4 to PLS-5 (reviewed changes) as part of their implementation materials. S-LPs were given a document that served as a tutorial on use of the PLS-5 and its growth scale values as part of their implementation materials. S-LPs were provided with written instructions for how to submit outcome monitoring data online via RedCap.

Table 2 (Continued)			
Component	Barriers	Supports	Actions
Evidence-based innovation			
Translation process (how procedure was determined)	<ul style="list-style-type: none"> S-LPs may have had limited knowledge of systematic research methods. 	<ul style="list-style-type: none"> The recommended procedures were developed using rigorous research methods at a respected academic institution. Program leaders and S-LPs were included in the development of the recommendations, implementation materials, and intervention. 	<ul style="list-style-type: none"> The methodology and scientific rigour used to develop the new outcome monitoring procedures was highlighted in the webinar. S-LPs were given a written copy of the evidence review used to develop the new outcome monitoring procedures providing further evidence of methodological rigour.
Innovation	<ul style="list-style-type: none"> Some S-LPs questioned use of the PLS-5 for program-level outcome monitoring because of online reports questioning its validity that were circulated within the IHP. S-LPs may have perceived the recommendations as too burdensome. S-LPs may have questioned the value of submitting outcome monitoring data online. 	<ul style="list-style-type: none"> The recommended program-level procedure was compatible with, but an improvement upon, current practice. The new procedures recommended many assessment tools S-LPs were already familiar with. 	<ul style="list-style-type: none"> A section of the webinar was dedicated to explaining why regular outcome monitoring was important and why the new procedures were an improvement on current practice. Reports from the Joint Committee on Infant Hearing were included as implementation materials to provide additional evidence for the value of the new procedures. S-LPs were provided with a document that responded to concerns they had reported regarding validity of the PLS-5 as part of their implementation materials. S-LPs were provided with instructions for reporting data as part of their implementation materials. This document also described how data could be used to inform practice and service delivery. A peer-reviewed research paper that analyzed data collected in the IHP was included as evidence of the value of outcome monitoring.

Note. S-LP = speech-language pathologist; IHP = the Infant Hearing Program; PLS-4 = the Preschool Language Scales (4th ed.); PLS-5 = the Preschool Language Scales (5th ed.); MBCDI = the MacArthur-Bates Communicative Development Inventories.

Research transfer strategy. In addition to using knowledge about barriers and supports to tailor implementation materials, knowledge is used to select research transfer strategies (Logan & Graham, 1998). These can range from passive (e.g., publishing recommendations

online) to systematic efforts that encourage and support implementation (e.g., education seminars, clinical training workshops, tailored online learning modules). Researchers should aim to address barriers and enhance supports related to the practice environment, potential adopters,

and evidence-based innovation in the development of their transfer strategies (Logan & Graham, 1998).

Our research transfer strategy was an online learning module. We established through discussion with stakeholders that this was the most efficient and effective way of reaching dozens of S-LPs at 30 sites across a wide geographic region. Content and structure of the module was developed based on our predictions about the barriers and supports for the IHP's practice environment and potential adopters, as well as our evidence-based innovation. The module was also developed in consultation with S-LPs, managers, and policy makers from the IHP to ensure content was clinically relevant and useful, and that the online learning environment was appropriate (**Table 2**). The online learning module was hosted through OWL, Western University's online learning management system. We invited S-LPs involved in this study to register for an OWL account and access the online learning module remotely at a convenient time for them. In the online module, S-LPs read an executive summary, viewed a 40-minute recorded webinar, reviewed electronic copies of printed implementation materials (with the option to download), and (optionally) reviewed publications selected to support the uptake of knowledge and implementation of outcome monitoring procedures. A detailed description of the online learning module content is available in the Appendix.

Once research transfer has happened, adoption and use are monitored and outcomes are evaluated. Research adoption and use is monitored to determine whether new ideas are being used (vs. adopted but later abandoned), and whether they are being used as intended (e.g., adopted, but no longer used as intended) allowing researchers to understand whether evidence was adopted and used, but also whether use changed over time (Logan & Graham, 1998). Outcomes can relate to patients, practitioners, or the system and are evaluated to understand the impact of the evidence-based innovation.

To monitor research adoption and use, an online discussion forum was added to the online learning module where S-LPs could ask questions, make comments, and get answers from the research team about implementing the recommended procedures. This forum served as an avenue for information sharing, but also as a research transfer strategy. For the purposes of this study, outcomes were evaluated as changes in S-LPs' (a) perceptions about outcome monitoring and its relevance to practice and program evaluation and (b) understanding of the new program-level outcome monitoring and individual vulnerability testing procedures.

Method

This quality improvement study was completed as part of a larger government program evaluation project that was reviewed by the Western University Research Ethics Board. The Research Ethics Board considered the project not to be research as described in the Canadian Tri-Council Policy Statement V.2 (Research Exempt from REB Review, Article 2.4) and therefore it was not considered to fall under its purview.

Participants

Seventy-three S-LPs working on Ontario's IHP completed a learning module for program-level outcome monitoring between September and December 2017. Among them, 56 completed both pre- and post-module surveys. These S-LPs had an average of 13 years of clinical work experience ($SD = 7.41$) and an average of 8 years of experience providing services to children who are deaf or hard of hearing ($SD = 6.74$). A sub-group of 28 S-LPs also provided survey data regarding individual vulnerability testing.

Study Design

A pre-post design was used to determine whether S-LPs' perceptions about outcome measurement, their understanding about the procedures to be implemented, and their intentions to implement procedures in practice changed after viewing the online learning module. Also, S-LPs were surveyed about their impressions of the materials and online module itself. S-LPs took an anonymous pre-module survey, completed the online learning module, and then immediately took an anonymous post-module survey.

Materials

S-LPs completed pre- and post-module surveys related to program-level outcome monitoring procedures. Most questions were repeated in parallel form on both surveys to learn about S-LPs' perceptions of the existing (pre-module) and new (post-module) procedures. The pre-module survey included 12 questions (**Table 3**). Five were open-ended questions about S-LPs' experiences working in the IHP, their knowledge of current discharge policies, and their understanding of current program-level spoken language outcome monitoring procedures. Six questions asked S-LPs to rate the extent to which they agreed/disagreed with statements about their awareness of the existing outcome monitoring procedure and beliefs about the impact of outcome monitoring on services, outcomes, and clinical practice. Ratings were made using a 5-point Likert scale that ranged from (1) *strongly disagree* to (5) *strongly agree*. The last question was a multiple-choice question that

Table 3**Speech-Language Pathologists' Responses to Pre-Module Survey Questions about Program-Level Outcome Monitoring**

Number	Question	Responses N (%)					Descriptive statistics
		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)	
3a	I am aware of existing discharge policies	4 (7%)	5 (9%)	4 (7%)	22 (39%)	21 (38%)	Mode = 4 Range = 1–5
3b	The existing outcome monitoring procedure was developed using the best available research evidence	2 (5%)	2 (4%)	26 (46%)	23 (41%)	3 (5%)	Mode = 3 Range = 1–5
3c	The existing procedure serves to improve services for children with hearing loss and their families	1 (2%)	8 (14%)	20 (36%)	24 (43%)	3 (5%)	Mode = 4 Range = 1–5
3d	The existing procedure is useful for my practice	1 (2%)	9 (16%)	26 (46%)	18 (32%)	2 (4%)	Mode = 3 Range = 1–5
3e	The Ministry uses data from outcome monitoring to inform decisions about service delivery and resource allocation	0 (0%)	3 (5%)	28 (50%)	18 (32%)	7 (13%)	Mode = 3 Range = 1–5
3f	I understand and follow the existing outcome monitoring procedure	2 (4%)	1 (2%)	13 (23%)	27 (48%)	13 (23%)	Mode = 4 Range = 1–5

asked S-LPs to correctly identify the existing program-level outcome monitoring procedure.

The post-module survey included eight questions (Table 4). Six were the same statements presented in the pre-module survey related to S-LPs' awareness of program-level outcome monitoring procedures (now about the new procedures for program-level outcome monitoring) and beliefs about the impact the new program-level outcome monitoring would have on services, outcomes, and clinical practice. One was a multiple-choice question that asked S-LPs to correctly identify the new program-level

outcome monitoring procedure. Another question asked S-LPs to enter comments about their understanding and perceptions of the new procedures, and their development, importance, and relevance to the program and to practice.

S-LPs who also completed training specific to individual vulnerability testing answered an additional six questions (Table 5). As individual vulnerability testing was a new procedure, only post-module data were collected. Five questions asked S-LPs to rate statements about the development and benefit of this procedure using the same 5-point Likert scale, and one asked S-LPs to enter

Table 4

Speech-Language Pathologists' Responses to Post-Module Survey Questions about Program-Level Outcome Monitoring

Number	Question	Responses N (%)					Descriptive statistics
		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)	
4a	The IHP's new Program-level outcome monitoring process was developed based on the best available research evidence	0 (0%)	0 (0%)	1 (2%)	15 (27%)	40 (71%)	Mode = 5 Range = 3-5
4b	The IHP's new Program-level outcome monitoring process will improve services for families of children with permanent hearing loss	0 (0%)	1 (2%)	7 (12%)	30 (54%)	18 (32%)	Mode = 4 Range = 2-5
4c	The IHP's new Program-level outcome monitoring process will be useful for my clinical practice	1 (2%)	1 (2%)	6 (10%)	33 (59%)	15 (27%)	Mode = 4 Range = 1-5
4d	Data from IHP's new Program-level outcome monitoring process will be used to inform service delivery planning and resource allocation decisions	0 (0%)	0 (0%)	10 (18%)	27 (48%)	19 (34%)	Mode = 4 Range = 3-5
4e	I understand the new Program-level outcome monitoring process	0 (0%)	0 (0%)	0 (0%)	36 (64%)	20 (36%)	Mode = 4 Range = 4-5
4f	I plan to implement the new Program-level outcome monitoring process in my clinical practice	1 (2%)	0 (0%)	1 (2%)	30 (53%)	24 (43%)	Mode = 4 Range = 1-5

Note. IHP = the Infant Hearing Program.

comments about their understanding and perceptions of the new individual vulnerability testing procedures.

Analyses

Quantitative data were analyzed descriptively using mode and range. A Wilcoxon sign-rank test was used to compare pre-module (understanding and perceptions of existing procedures) and post-module (understanding and perceptions of new procedures) ratings about program-level outcome monitoring. A McNemar's chi-square statistic was used to determine whether the proportion of S-LPs rating each item positively changed from pre- to post-module. To calculate this statistic, responses were grouped into positive (strongly agree and agree) and negative

(strongly disagree, disagree, and neutral) responses, and the proportion of positive to negative responses at pre- and post-test were compared.

Qualitative data were analyzed using content analysis. The following steps were taken: (1) familiarization of data through reading and re-reading survey responses; (2) identifying patterns, sorting responses into categories, and ensuring homogeneity across categories; and (3) reporting category labels and example quotes (Elo & Kyngäs, 2008).

Procedure

To recruit IHP S-LPs from across Ontario, an initial

Table 5

Speech-Language Pathologists' Responses to Post-Module Survey Questions About Individual Vulnerability Testing

Number	Question	Responses N (%)					Descriptive statistics
		Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)	
5a	The IHP's new Individual Vulnerability testing process was developed based on the best available research evidence	0 (0%)	0 (0%)	0 (0%)	15 (54%)	13 (46%)	Mode = 4 Range = 3-5
5b	The IHP's new Individual Vulnerability testing process will improve services for families of children with permanent hearing loss	1 (3%)	0 (0%)	5 (18%)	15 (54%)	7 (25%)	Mode = 4 Range = 1-5
5c	The IHP's new Individual Vulnerability testing process will be useful for my clinical practice	1 (3%)	0 (0%)	7 (25%)	13 (46%)	7 (25%)	Mode = 4 Range = 1-5
5d	I understand the new Individual Vulnerability testing process	0 (0%)	0 (0%)	1 (3%)	19 (68%)	8 (29%)	Mode = 4 Range = 3-5
5e	I will implement the new Individual Vulnerability testing process in my clinical practice	1 (3%)	0 (0%)	1 (3%)	17 (61%)	9 (32%)	Mode = 4 Range = 1-5

Note. IHP = the Infant Hearing Program.

memorandum introducing the new outcome monitoring procedures and quality improvement pilot study was sent to IHP coordinators (local clinical leaders within the program). A known senior policy maker at the Ministry sent this memo and coordinators were invited to review the documents.

One week later, senior policy makers at the Ministry hosted a teleconference where coordinators could ask questions about the project. Representatives from the research team were available to answer questions about implementation methods and materials, the recommended procedures, and the quality improvement pilot. During the teleconference, coordinators were invited to volunteer their sites to participate in the pilot for program-level outcome monitoring or to pilot both program-level outcome monitoring and individual vulnerability testing. A deadline was set for responses within 2 weeks. Eleven sites volunteered to pilot program-level outcome monitoring. Ten also volunteered to pilot individual vulnerability testing.

Coordinators at volunteer sites provided the research team with contact information for the S-LPs who would be participating. We sent a group email to the S-LPs explaining the purpose of the pilot (i.e., for a select group of clinicians to learn the new procedures and pilot test them for 1 year) and gave instructions for accessing the online learning module. S-LPs were instructed to complete the surveys and online learning module before they began assessing children using the new procedures. Surveys were delivered using Qualtrics (Qualtrics, Provo, UT), a site that operated independently from the online learning module so S-LPs could be assured full anonymity in their response to survey questions. A self-generated anonymous username linked responses to the pre- and post-survey questions. Only S-LPs who also volunteered to pilot individual vulnerability testing, in addition to program level outcome monitoring, viewed implementation materials and methods for these procedures.

Results

Seventy of the 73 S-LPs who received the email invitation completed the pre-module survey (96% response rate). Fifty-six of the 73 S-LPs completed both the pre- and post-module surveys (77% response rate). General response trends at pretest did not differ significantly when data for those who completed the pre-module survey were compared with data for those who completed the pre- and post-module survey questions about program-level outcome monitoring. We suspect the S-LPs who did not complete post-module testing did not realize they needed to complete the survey after viewing the online learning module but have no way of confirming this. Since we assumed data were missing at random, the 14 individuals who did not complete the post-module survey were removed from the analyses.

Pre-Module Survey

The purpose of the pre-module survey was to determine S-LPs' understanding and perceptions of existing outcome monitoring procedures in the IHP (i.e., assessing all children every 6 months using the PLS-4). A question was also included to determine whether self-reported understanding of existing procedures matched S-LPs' abilities to identify the correct procedure. Ratings for items on the pre-module survey are presented in **Table 3**. Other findings from the pre-module survey are presented next.

When asked to rate how strongly they agreed with the statement "I am aware of existing discharge policies" (Question 3a), 43 respondents (77%) strongly agreed or agreed (**Table 3**). S-LPs were then asked to enter the criteria they used for discharge into a text box, and responses were categorized as correct or incorrect. Twenty-four S-LPs (43%) correctly reported that children were monitored until transition to school. Other responses included S-LPs reporting using standardized tests or clinical judgement to determine whether children's skills were within normal limits prior to discharge ($n = 22$, 39%), and other criteria such as parent request and discharge during the child's junior kindergarten year, typically 4 years of age in Canada ($n = 5$, 9%). Some were unsure or had not yet had to discharge a child from services ($n = 5$, 9%).

Similarly, 40 respondents (71%) strongly agreed or agreed that they understood and followed the existing outcome monitoring procedures (Question 3f), but this was not consistent with S-LPs' abilities to select the correct procedure for outcome monitoring from a list of five options. Only 30 S-LPs (54%) chose the correct response indicating they should "complete the PLS-4 every 6 months regardless of whether the child's skills are age-appropriate." Other responses included "complete the PLS-4 every 6

months until the child is discharged from services with age-appropriate skills" ($n = 15$, 27%); "complete the PLS-4 and the Focus on the Outcomes of Communication Under Six every 6 months until the child is discharged from services with age-appropriate skills" ($n = 9$, 16%); and "complete the PLS-4 and the Focus on the Outcomes of Communication Under Six every 6 months until the child has achieved what I believe to be his/her individual potential" ($n = 2$, 4%).

After completing pre-survey ratings, clinicians had the option of entering comments regarding their understanding and perceptions of the existing procedures for evaluating program-level spoken language outcomes in the IHP. We identified five categories through the content analysis: (a) concerns that the current process did not provide equitable services for all children with permanent hearing loss ($n = 3$); (b) concerns regarding validity of the PLS-4 ($n = 5$); (c) questions about what happens to program-level data once it is submitted ($n = 2$); (d) requests for clarification for testing families where children are English Language Learners ($n = 2$); and (e) other comments including positive comments about outcome monitoring and S-LPs indicating they had no IHP children on their caseloads ($n = 6$).

Post-Module Survey

Fifty-six S-LPs completed the post-module survey questions about program-level outcome monitoring. The purpose of this survey was to determine whether completing the online learning module increased their understanding and changed their perceptions about program-level outcome monitoring in the IHP. Ratings for these items on the post-module survey are presented in **Table 4**. Results comparing pre- to post-test ratings for program-level monitoring are presented next. Note that after completing the online learning module, very few S-LPs rated items as strongly disagree or disagree, and those that did not agree rated items as neutral (**Table 4**).

Did perceptions about the program-level outcome monitoring procedure being developed based on the best available evidence change? S-LPs' ratings were significantly higher on the post-module survey (Question 4a) than the pre-module survey (Question 3b), $z = -6.41$, $p < .01$. The proportion of S-LPs who rated this item positively was significantly higher on the post-module survey, $\chi^2 = 27.13$, $p < .01$ (3b and 4a; 26/56 = 46% vs. 55/56 = 98%).

Did perceptions about program-level monitoring improving services for children and families change? Ratings were significantly higher on the post-module survey (Question 4b) than the pre-module survey (Question 3c), $z = -4.93$, $p < .01$. The proportion of S-LPs rating this item positively was significantly higher on the post-module

survey, $\chi^2 = 19.17, p < .01$ (3c and 4b; 27/56 = 48% vs. 48/56 = 86%).

Did perceptions about the usefulness of program-level outcome monitoring for clinical practice change?

Ratings were significantly higher on the post-module survey (Question 4c) than the pre-module survey (Question 3d), $z = -4.72, p < .01$. The proportion of S-LPs rating this item positively was significantly higher on the post-module survey, $\chi^2 = 23.06, p < .01$ (3d and 4c; 20/56 = 36% vs. 48/56 = 86%).

Did perceptions about the Ministry using program-level data to inform decision making change?

Ratings were significantly higher on the post-module survey (Question 4d) than the pre-module survey (Question 3e), $z = -4.55, p < .01$. The proportion of S-LPs rating this item positively was significantly higher on the post-module survey, $\chi^2 = 14.29, p < .01$ (3e and 4d; 25/56 = 45% vs. 46/56 = 82%).

Did understanding of program-level outcome monitoring procedures change?

Ratings for understanding of procedure were significantly higher after completing the online module (Questions 3f and 4e), $z = -3.22, p = .01$. The proportion of S-LPs rating this item positively was significantly higher on the post-module survey, $\chi^2 = 16.00, p < .01$ (3f and 4e; 30/56 = 54% vs. 54/56 = 96%).

S-LPs were also asked to select the correct outcome monitoring procedure from a list of five options. Fifty-four S-LPs (96%) chose the correct response. Using McNemar's chi-square statistic, we found a significant difference in the proportion of S-LPs who selected the correct response between the pre- and post-module, $\chi^2 = 20.57, p < .01$.

After completing the ratings above, S-LPs had the option of entering comments about their understanding and perceptions of the new program-level spoken language outcome monitoring process and its relevance to practice. We identified five categories through content analysis: (a) concern about low-functioning children not meeting the required timelines and expectations for assessment ($n = 1$); (b) preference for another standardized measure over the PLS-5 ($n = 2$); (c) requests for direction for testing children who are English Language Learners ($n = 2$); (d) not having IHP children on their caseload ($n = 1$); and (e) positive comments about the new program-level outcome monitoring procedure ($n = 5$).

S-LPs who indicated they were participating in the individual vulnerability testing sub pilot ($n = 28$) were also asked to make ratings in response to additional statements about these procedures. The majority agreed or strongly

agreed with all statements, and other responses were typically neutral. Very few disagreed or strongly disagreed with the statements about individual vulnerability testing procedures (**Table 5**).

S-LPs also had the option of entering comments regarding their understanding and perceptions of the new individual vulnerability testing procedure. Four categories were identified in the content analysis: (a) questions about testing for articulation ending at age 4 ($n = 3$); (b) concerns about spending too much time assessing or that assessments would be too difficult for some children ($n = 2$); (c) concerns about eligibility for individual vulnerability testing and subsequent missing data (e.g., a child is tested once and then gets cochlear implants and leaves the IHP, $n = 1$); and (d) a positive comment about the new individual vulnerability testing procedure ($n = 1$).

Finally, 54 S-LPs rated their agreement about how valuable each of the implementation materials presented in the online learning module were using the same 5-point Likert Scale. Over 80% of S-LPs agreed or strongly agreed that 10/13 resources were valuable. Sixty-six percent of S-LPs agreed or strongly agreed that the evidence review and overview of recommendations (Oram Cardy & Daub, 2017) and Joint Committee on Infant Hearing documents (Joint Committee on Infant Hearing, 2007; Joint Committee on Infant Hearing et al., 2013) were valuable. Further, 43% agreed or strongly agreed that the Daub, Bagatto, Johnson, and Oram Cardy (2017) article was valuable for supporting implementation (**Table 6**). Lower ratings were for the optional components (see the Appendix).

Discussion

Using the Ottawa Model of Research Use (Logan & Graham, 1998) and in collaboration with community S-LPs, managers, and policy makers, we developed an online learning module to support the implementation of evidence-based assessment procedures for the monitoring of spoken language outcomes and individual vulnerabilities in children who are deaf or hard of hearing in Ontario, Canada's Infant Hearing Program. Prior to implementing province-wide, we conducted this quality improvement pilot study to determine whether S-LPs' (previously negative) perceptions about outcome monitoring and their (previously inconsistent) understanding about outcome monitoring procedure(s) changed after completing the online learning module. This pilot served to demonstrate proof of concept for the online learning module as a knowledge translation tool and to identify additional barriers that may be important to address prior to more widespread implementation across the IHP.

Table 6

S-LPs' Ratings for Each of the Implementation Materials

	Responses <i>N</i> (%)					Descriptive statistics	Did not view
	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)		
Executive summary	0 (0%)	0 (0%)	9 (17%)	28 (54%)	15 (29%)	Mode = 4 Range = 3–4	2
Webinar	0 (0%)	1 (2%)	4 (8%)	23 (44%)	24 (46%)	Mode = 5 Range = 2–5	2
PDF of webinar slides	0 (0%)	1 (2%)	5 (10%)	24 (46%)	22 (42%)	Mode = 4 Range = 2–4	2
S-LP desk reference for program-level monitoring	0 (0%)	0 (0%)	1 (2%)	17 (33%)	34 (65%)	Mode = 5 Range = 3–5	2
Parent handout for outcome monitoring and assessment schedule	0 (0%)	0 (0%)	2 (4%)	22 (42%)	28 (54%)	Mode = 5 Range = 3–5	2
Overview of changes (PLS-4 to PLS-5)	0 (0%)	0 (0%)	6 (12%)	22 (46%)	20 (42%)	Mode = 4 Range = 3–5	6
Tutorial for using PLS-5 growth scale values	0 (0%)	0 (0%)	5 (10%)	22 (46%)	21 (44%)	Mode = 4 Range = 3–5	6
UWO Response to concerns about validity of the PLS-5	0 (0%)	0 (0%)	5 (10%)	31 (60%)	16 (30%)	Mode = 4 Range = 3–5	2
Parent instructions for completing the MBCDI	0 (0%)	0 (0%)	7 (13%)	28 (54%)	17 (33%)	Mode = 4 Range = 3–5	2
S-LP desk reference for individual vulnerability testing	0 (0%)	0 (0%)	5 (11%)	25 (54%)	16 (35%)	Mode = 4 Range = 3–5	8
UWO Evidence Review: Recommendations for the Assessment of Spoken Language in the IHP	0 (0%)	0 (0%)	10 (34%)	11 (38%)	8 (28%)	Mode = 4 Range = 3–5	25
Joint Committee on Infant Hearing Publications	0 (0%)	0 (0%)	10 (34%)	13 (45%)	6 (21%)	Mode = 4 Range = 3–5	25
Daub et al. (2017) article	0 (0%)	0 (0%)	13 (56%)	7 (30%)	3 (13%)	Mode = 3 Range = 3–5	31

Note. S-LP = speech-language pathologist; PLS-4 = the Preschool Language Scales (4th ed.); PLS-5 = the Preschool Language Scales (5th ed.); UWO = University of Western Ontario; MBCDI = the MacArthur-Bates Communicative Development Inventories; IHP = Infant Hearing Program.

After completing the online learning module, S-LPs reported improved perceptions about program-level outcome monitoring, namely, that it had been developed based on high quality research evidence and would improve practice and service delivery in the IHP, and that the Ministry would use the outcome data collected. S-LPs also reported

improved understanding of program-level outcome monitoring and intentions to implement procedures into practice after completing the online learning module. We could not report changes in S-LPs' perceptions about individual vulnerability testing procedures because these areas were not monitored prior to this pilot. However, we

did note that S-LPs rated items about their perceptions of the individual vulnerability testing procedures and their potential impact on practice and service positively. They also indicated intentions to implement these procedures in practice.

Results from this quality improvement pilot study demonstrate changes in perceptions and intentions to implement immediately after completing the online learning module. Although we cannot confirm that these intentions led to changes in practice, the theory of planned behaviour suggests that an individual's intentions are strongly linked to behaviour change (Ajzen, 1991). The theory also states that intentions are shaped by attitudes, subjective norms, and perceived behavioural control (Ajzen, 1991). After completing the online learning module, S-LPs in our pilot reported positive attitudes towards the new assessment procedures and perceptions of being able to implement them in practice. Over the pilot year, S-LPs used the new assessment procedures and submitted outcome monitoring data. Findings from this phase of the pilot are being prepared as a separate manuscript.

After reviewing the online learning module, positive changes in S-LPs' knowledge of and perceptions about the procedures to be implemented improved. We believe the online learning module was a successful implementation tool for two reasons. First, theory was used to identify barriers and supports to implementation, guide development of the educational materials used in the online learning module, and develop methods for evaluating the effectiveness of our implementation efforts (Colquhoun, Letts, Law, MacDermid, & Missiuna, 2010). Using the Ottawa Model of Research Use (Logan & Graham, 1998), we were able to develop materials and methods aimed at addressing known barriers to implementation in the IHP, which likely facilitated changes in S-LPs' perceptions (Campbell & Douglas, 2017). For example, knowing that S-LPs had large caseloads and limited flexibility, we decided to use an online training that could be accessed at times that fit into S-LPs' individual schedules. Knowing that S-LPs had negative perceptions about the validity of the PLS-4 prompted us to include a document reviewing the research evidence for the validity of the tool and debunking myths based on online blogs that had precipitated their concerns.

The second reason we believe our implementation efforts were successful was that we used principles of integrated knowledge translation throughout the development of our intervention. Integrated knowledge translation is "a model of collaborative research, where researchers work with knowledge users who identify a

problem and have the authority to implement the research recommendations" (Kothari, McCutcheon, & Graham, 2018, p. 299). In our case, knowledge users were the S-LPs who would be implementing the outcome monitoring procedures and managers and policy makers from the IHP who would be using data to evaluate the program's effectiveness. These knowledge users were collaborators and consultants informing all phases of this project to ensure clinically relevant, practical, and useful methods and materials (Campbell & Douglas, 2017; Kothari et al., 2018; Kothari & Wathen, 2017). For example, S-LPs identified concerns with our initial recommendation for program-level outcome monitoring for children under 18 months of age (i.e., the PLS-5). This prompted further review of the literature and inclusion of an alternate measure for the IHP's youngest children (i.e., the MBCDI).

Our integrated knowledge translation efforts continue as we move towards program-wide implementation. Throughout this study, we sought further feedback from S-LPs who identified additional issues to be addressed prior to provincial implementation. These included further clarification for procedures for testing children who are English Language Learners and those who are low-functioning, and for specific inclusion criteria for which children should participate in outcome monitoring. For the remainder of the pilot, S-LPs collected and reported data using the recommended outcome monitoring procedures. At the end of the year, we collected additional feedback about the process and schedule of assessments. Implementation materials and procedures are being further refined prior to provincial implementation.

We acknowledge some limitations to this study. First, a known disadvantage of using a pre-post study design is the lack of a control group. Thus, we cannot say for certain whether changes in S-LPs' perceptions were due to the online learning module or other outside factors (Ray, 1997). We do, however, feel that because the surveys were completed immediately prior to and following completion of the online learning module, it is likely the changes were due to the online learning module. Second, while self-report questionnaires can be an effective way of evaluating implementation interventions in healthcare settings, they are subject to outside influences like social desirability bias (Boyko, Dobbins, DeCorby, & Hanna, 2013). We attempted to mitigate this bias by having S-LPs complete the pre- and post-module surveys anonymously, but it is still possible our results were affected.

Despite these limitations, we believe this work can serve as a model for other research groups who collaborate with

community S-LPs and government programs to generate and implement knowledge that is meaningful and useful for practice. Engaging S-LPs and organizations in research may improve not only the implementation of research evidence into practice, but also health care processes and outcomes for children and families (Boaz, Hanney, Jones, & Soper, 2015; Campbell & Douglas, 2017).

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Appendix

Required and Optional Components of the Online Learning Module

Required components	
Item	Description
1	Executive summary
2	40-minute webinar describing the literature review, development of procedures to be implemented, and methods for implementing procedures
3	Desk reference outlining the timing for outcome monitoring assessments using the MBCDI/PLS-5
4	A letter for parents/caregivers providing information on the purpose and timing of regular outcome monitoring in the infant hearing program
5	Materials to support implementation of the PLS-5
6	Materials to support implementation of the MBCDI
7	Materials to support individual vulnerability testing
8	Online data reporting instructions
Optional components	
Item	Description
1	Oram Cardy J., & Daub, O. (2017). <i>Recommendations for the assessment of spoken language in the Ontario Infant Hearing Program</i> . Toronto, Ontario: Ontario Ministry of Children and Youth Services.
2	Joint Committee on Infant Hearing. (2007). Year 2007 position statement: Principles and guidelines for Early Hearing Detection and Intervention programs. <i>Pediatrics</i> , 120, 898–921. doi:10.1542/peds.2007-2333
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4	Daub, O., Bagatto, M. P., Johnson, A. M., & Oram Cardy, J. E. (2017). Language outcomes in children who are deaf and hard of hearing: The role of language ability before hearing aid intervention. <i>Journal of Speech, Language, and Hearing Research</i> , 60, 3310–3320. doi:10.1044/2017JSLHR-L-16-0222



Engaging Clinicians and Graduate Students in the Design and Evaluation of Educational Resources About Universal Design for Learning



Impliquer des cliniciens et des étudiants de cycles supérieurs dans la conception et l'évaluation de ressources pédagogiques portant sur la Conception universelle de l'apprentissage

KEYWORDS

KNOWLEDGE
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UNIVERSAL DESIGN FOR
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Abstract

The mandate to provide inclusive education in Canadian schools means that speech-language pathologists need to be well-versed in frameworks, such as Universal Design for Learning, that support learning among students with diverse abilities. To be responsive, professional graduate programs need resources that support teaching speech-language pathology students about Universal Design for Learning. The purpose of this article was to demonstrate (a) how we applied an instructional design model and knowledge translation theory to develop educational resources about Universal Design for Learning for speech-language pathology graduate students and (b) how we assessed the feasibility of these resources and students' perceived and actual knowledge change about Universal Design for Learning. We created the educational resources using the first three phases of the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) instructional design model together with a knowledge translation theory, Diffusion of Innovations, and through engagement of experienced school speech-language pathologists. Next, we applied the last two phases of ADDIE by delivering our resources to 19 speech-language pathology students during an educational session. We assessed the feasibility of resources and students' knowledge of Universal Design for Learning through pre-post web-based questionnaires. Preliminary findings indicated that students perceived the resources to be practical and acceptable and there was improvement in students' perceived knowledge of Universal Design for Learning. Resources should be implemented in a larger student cohort to reassess feasibility and knowledge change. We believe that this novel resource development methodology could serve useful to educators, researchers, and clinicians to develop high-quality, theory-informed educational resources.

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Abrégé

L'obligation d'adopter des pratiques d'enseignement inclusives au sein des écoles canadiennes se traduit notamment par le fait que les orthophonistes doivent maîtriser différentes approches pédagogiques, telles que la Conception universelle de l'apprentissage, afin de favoriser l'apprentissage chez les élèves ayant des habiletés et des besoins variés. Afin de répondre aux besoins de la profession, les programmes de formation professionnelle de cycles supérieurs en orthophonie doivent avoir accès à des ressources destinées à l'enseignement de la Conception universelle de l'apprentissage. L'objectif de cet article était de présenter (a) la façon dont nous avons eu recours à un modèle d'ingénierie pédagogique et à une théorie de transfert des connaissances afin de mettre au point des ressources pédagogiques portant sur la Conception universelle de l'apprentissage destinées à des étudiants de cycles supérieurs en orthophonie; et (b) la façon dont nous avons évalué s'il était faisable d'utiliser ces ressources pour enseigner la Conception universelle de l'apprentissage et si les connaissances réelles et perçues des étudiants sur cette approche avaient augmenté. Nous avons conçu des ressources pédagogiques en nous appuyant sur les trois premières étapes du modèle d'ingénierie pédagogique ADDIE (analyse, design, développement, implantation, évaluation), sur une théorie de transfert des connaissances (appelée la diffusion de l'innovation) et sur les suggestions effectuées par des orthophonistes expérimentés travaillant en milieu scolaire. Les deux dernières étapes du modèle ADDIE se sont concrétisées par la présentation de nos ressources à 19 étudiants en orthophonie lors d'un cours de leur cursus universitaire. Nous avons évalué s'il était faisable d'utiliser les ressources et si les connaissances des étudiants au sujet de la Conception universelle de l'apprentissage avaient augmenté à l'aide de questionnaires en ligne distribués avant et après la présentation de ces ressources. Les résultats préliminaires indiquent que les ressources ont été perçues comme étant pratiques et acceptables par les étudiants et que ceux-ci ont noté une amélioration de leurs connaissances sur la Conception universelle de l'apprentissage. Ces ressources devraient être présentées à un groupe d'étudiants plus important afin de réévaluer la faisabilité de leur mise en application, ainsi que leur impact sur l'acquisition des connaissances reliées à la Conception universelle de l'apprentissage. Il est de notre avis que la nouvelle méthodologie présentée dans le présent article pourrait s'avérer utile pour le personnel enseignant, les chercheurs et les cliniciens lors de la conception de ressources pédagogiques de qualité s'appuyant sur la théorie.

Inclusive education is the acceptance and meaningful involvement of all students into neighbourhood classrooms with their same-age peers with any necessary supports required for success (Ontario Ministry of Education, 2009). Speech-language pathologists (S-LPs) who work in schools need to know how to support inclusive education practices (Tomas, Cross, & Campbell, 2018). Universal Design for Learning (UDL) is a framework that educators use to support inclusive education (Meyer, Rose, & Gordon, 2014). Speech-language pathology students would benefit from learning about UDL to enhance their preparation for school-based practice (Campbell, Selkirk, & Gaines, 2016).

Universal Design for Learning

UDL is an inclusive education framework that emerged from the universal design movement in architecture, where it has long been recognized that designing for physical accessibility from the outset is much better than retrofitting after the fact (Campbell et al., 2016). Developed by researchers at the Center for Applied Special Technology, UDL takes those lessons and applies them to education: Instead of retroactively making one-off changes to the curriculum for individual children, the UDL framework promotes the proactive design of inclusive learning environments that support every child (Center for Applied Special Technology, 2019).

As Meyer et al. (2014) explained, UDL has three principles to guide development of a flexible and accessible curriculum: (a) provide multiple means of engagement by implementing strategies that motivate and engage students in their learning, (b) provide multiple means of representation by conveying content in various ways to increase student recognition and comprehension, and (c) provide multiple means of action and expression by providing options for students to express their knowledge and develop skills. Each UDL principle has three corresponding guidelines to support implementation; for example, the principle *multiple means of engagement* includes guidelines for recruiting students' interests, sustaining effort and persistence, and supporting self-regulation. Further, each guideline includes checkpoints that provide specific strategies for implementing that guideline. For example, students' interest can be recruited by optimizing choice and autonomy.

Whereas researchers consistently report that students who are exposed to UDL feel greater academic confidence, show increased motivation to learn, and are more involved in their learning (Daley & Rose, 2018; Dean, Lee-Post, & Hapke, 2017; Ok, Rao, Bryant, & McDougall, 2017; Rappolt-Schlichtmann et al., 2013; Rose & Strangman, 2007; Smith & Lowrey, 2017), they are less certain about the impact of

UDL for all students regarding academic performance (Ok et al., 2017). Despite this uncertainty, the UDL framework currently is utilized or recommended for use in multiple jurisdictions (e.g., Alberta Ministry of Education, 2015; British Columbia Ministry of Education, 2011; Ontario Human Rights Commission, 2018; Ontario Ministry of Education, 2005, 2013).

S-LPs' Knowledge about UDL

Although UDL figures prominently in education research and policy, many S-LPs are not familiar with this framework (Campbell et al., 2016). In a 2016 survey of 91 Canadian school-based S-LPs, 30% of respondents had never heard of UDL, and among those who had, a majority were not confident that they could describe UDL in relation to the S-LP profession or implement UDL-based strategies in a classroom setting (Campbell et al., 2016). More recently, researchers reported that school S-LPs rarely use UDL terminology when recommending or applying inclusive strategies in the classroom (Kennedy et al., 2018). Initiatives are needed that increase awareness, knowledge, and a common understanding of UDL (Campbell et al., 2016). Researchers have highlighted the importance of beginning training about educational frameworks and collaboration with educators at the student level to ensure readiness when these pre-professionals enter the school system (Suleman, McFarlane, Pollock, Schneider, & Leroy, 2013). Speech-language pathology students are one group that could be targeted to increase UDL knowledge before they enter the workforce (Ralabate, Currie-Rubin, Boucher, & Bartecchi, 2014; Suleman et al., 2013; Zurawski, 2014).

Purpose

With the aim of increasing UDL knowledge among the speech-language pathology student population, the purpose of this article is twofold: (a) to illustrate a theory-informed process of developing educational resources about UDL using a theory from the field of knowledge translation (KT) called Diffusion of Innovations (DOI) theory, combined with the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) instructional design model and the involvement of practising school S-LPs and (b) to describe implementation of these newly developed resources with speech-language pathology students and evaluate their perceptions of resource feasibility as well as the impact of the resources on their perceived and actual knowledge of UDL.

Using KT to Increase UDL Knowledge Among Speech-Language Pathology Students

KT describes the iterative process of "getting the right information, to the right people, at the right time, in a format they can use, so as to influence decision

making” (Knowledge Translation Australia, 2016, p. 1). One component of KT is called knowledge dissemination, which involves the communication of research findings to a target audience by tailoring information to that specific group (Canadian Institutes of Health Research, 2016), such as through educational resources like written materials or presentation slides (Farmer et al., 2008; Gagnon, 2011; Medves et al., 2010). Knowledge dissemination is critical to ensure that important information is available and understandable to the specific target audience. Use of KT theory is recommended to develop effective high-quality dissemination strategies such as educational resources (Eccles, Grimshaw, Walker, Johnston, & Pitts, 2005; Estabrooks, Thompson, Lovely, & Hofmeyer, 2006; Tabak, Khoong, Chambers, & Brownson, 2012). Yet, many authors do not apply KT theory during resource development, nor do they systematically explain its application in the development process (Davies, Walker, & Grimshaw, 2010; Levac, Glegg, Camden, Rivard, & Missiuna, 2015; Scott et al., 2012; Squires, Sullivan, Eccles, Worswick, & Grimshaw, 2014). As a result, theory-driven approaches for developing resources are lacking (Curran, Grimshaw, Hayden, & Campbell, 2011; Eccles et al., 2005; Tabak et al., 2012). Studies are needed that better describe the theory and methods underpinning the resource development process (Scott et al., 2012; Squires et al., 2014).

Diffusion of Innovations: A Theory for Supporting Dissemination

One theory that helps guide dissemination research is the DOI theory (Rogers, 1995). As Rogers (1995) described, DOI theory attempts to explain why some ideas are more likely to be adopted than others and comprises four elements. First, characteristics of the innovation will influence why some innovations are more likely to be adopted than others. For example, the characteristic of *complexity* refers to how easy or difficult it may be for an individual to apply or use the innovation. Second, the element of time considers two components: the innovation-decision process, which focuses on how people’s changing perceptions of an innovation influences adoption, and adopter categories, which refers to groups of people who vary in how slowly or quickly they take up an innovation. Third, the communication channel by which messages are delivered can impact uptake of an innovation. The final element, the social system, addresses the structure of societal members and which members hold the most influence in changing behaviour towards an innovation. As identified by Tabak et al. (2012), DOI theory is recognized for its relevance to dissemination in health care and is known to effectively enhance dissemination efforts (Britto, Schoettker, Pandzik, Weiland, & Mandel, 2007; Cunningham, Rosenbaum, & Hidecker, 2016).

When used in the development of educational resources, DOI theory can inform how to select and tailor the resource content to encourage widespread adoption of the innovation; however, it does not provide an actual stepwise methodology or process on how to develop dissemination strategies like educational resources. Depending on the chosen dissemination strategy, other models can be used to provide a methodology for development. In this case, given that we aimed to develop educational resources, we looked towards instructional design models that could provide guidance and a stepwise methodological process to inform development of high-quality resources (Levac et al., 2015; Peterson, 2003).

ADDIE: A Model for Supporting Instructional Design

ADDIE is a five-phase instructional design model (Allen, 2006; Dick, Carey, & Carey, 2009; Peterson, 2003). First, the Analysis phase involves background research—examining the literature to determine a target audience’s learning needs on a topic (Reinbold, 2013). Second, in the Design phase, information gained from the Analysis phase is used to design learning activities and draft educational resources (Reinbold, 2013; Wang & Hsu, 2009). Third, the Development phase involves assembling and validating resources before implementation (Allen, 2006; Peterson, 2003; Reinbold, 2013; Wang & Hsu, 2009). Fourth, the Implementation phase involves the delivery of educational resources to the target audience (Reinbold, 2013; Wang & Hsu, 2009). Fifth, the Evaluation phase measures desired outcomes to ensure educational goals are met (Kurt, 2018; Reinbold, 2013). Although descriptively linear, the ADDIE model is iterative and cyclical (Reinbold, 2013). Involvement of key stakeholders within ADDIE is an important component in shaping the final product of the educational resources (Williams, South, Yanchar, Wilson, & Allen, 2011). Instructional designers who work with stakeholders and modify resources based on their feedback have a higher likelihood of producing high-quality resources suitable for the intended audience (Williams et al., 2011).

ADDIE has proven effective in educational resource design and is recommended to guide resource development (Battles, 2006; Park & Song, 2017; Reinbold, 2013; Shibley, Amaral, Shank, & Shibley, 2011; Wang & Hsu, 2009). Within educational curriculum development, ADDIE provides a model that guides student-centered resource development and improves learning potential (Battles, 2006; Robinson & Dearmon, 2013). For example, ADDIE was successfully used to design effective educational resources about bedside best-practice for undergraduate nurses (Robinson & Dearmon, 2013) and to develop modules that disseminated knowledge on supported employment for

community behavioural health treatment programs (Patel, Margolies, Covell, Lipscomb, & Dixon, 2018).

ADDIE is now being recognized for educational resource design within the field of rehabilitation science (Levac et al., 2015). Levac et al. (2005) provided best-practice recommendations regarding development of educational resources informed by KT theories and the ADDIE model in rehabilitation science. KT theories help provide the theoretical foundation of how to frame the resources and the specific content to include, while the ADDIE model provides systematic guidance and the methodology needed to develop and evaluate high-quality, effective educational resources in rehabilitation science (Levac et al., 2015). Consistent with the dual purpose of our study, we will report our study as comprising two major sections: (1) the resource development process and (2) a pilot study involving resource implementation and evaluation.

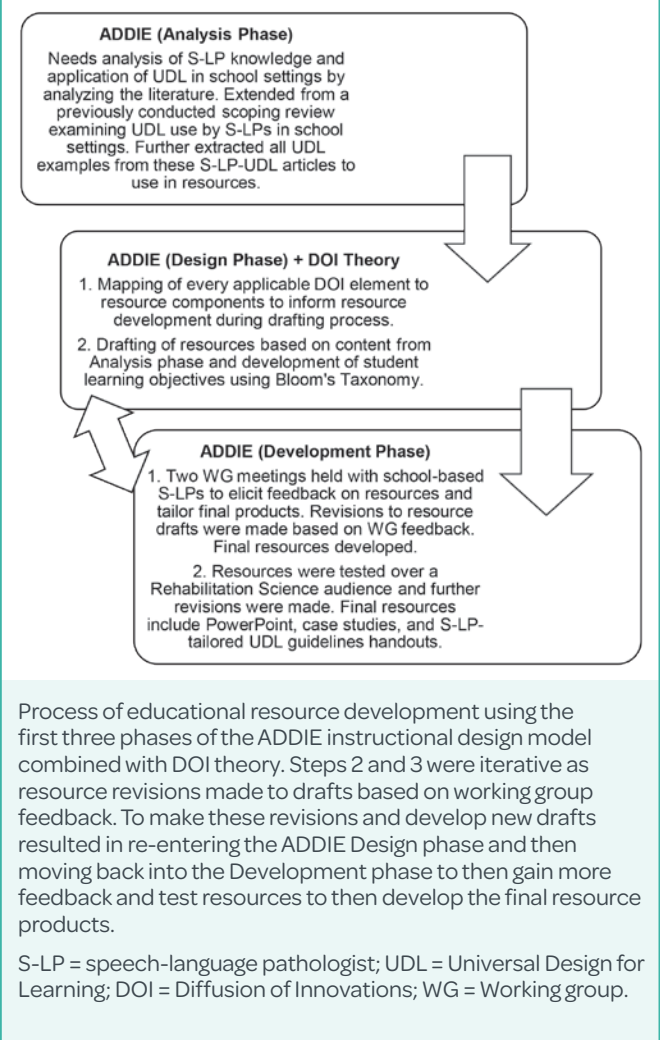
Section One: A Process for Developing Educational Resources

This study received ethics approval from the Hamilton Integrated Research Ethics Board (HiREB #3963). To achieve our first aim, we drew upon the first three phases of the ADDIE model—Analysis, Design, and Development—and integrated DOI theory into the Design phase (Figure 1).

Analysis Phase

In this phase, we sought to determine S-LPs' knowledge about UDL and its current application in school settings. Our work was informed by a scoping review that explored how S-LPs define and use UDL in school practice (Kennedy et al., 2018). Through the review, we identified articles that provided inclusive education strategies and techniques similar to UDL that S-LPs currently use to support students in the classroom. We then matched each of these techniques to specific concepts within the UDL framework. This analysis provided a means of addressing a gap in knowledge about how S-LPs can implement UDL by collating practical strategies that S-LPs already use and reframing them using the terminology associated with UDL. For example, in a study conducted by Hadley, Simmerman, Long, and Luna (2000), rhythm sticks and clapping techniques were used to emphasize rhythm of words and syllables for students. The authors did not explicitly refer to this as UDL, but the strategy exemplifies the second UDL principle—provide multiple means of representation—specifically, checkpoint 2.2, which is to clarify syntax and structure (Center for Applied Special Technology, 2018). Through this first step, resource content could be framed within the UDL framework by utilizing information gained from Kennedy et al. (2018).

Figure 1



Design Phase Supplemented with DOI Theory

We incorporated DOI theory in the Design phase to inform resource learning activities and content before beginning the drafting process. The DOI elements (i.e., innovation characteristics, time, communication channel, and social system) were used to identify likely barriers of knowledge uptake. We mapped each element of DOI theory to ways these potential barriers could be addressed through our resources.

DOI theory mapping to guide resource content. DOI theory's five innovation characteristics are described in Table 1 along with examples of how each was incorporated into our educational resources. For example, *trialability* is an innovation characteristic that refers to the ability of the target audience to apply the innovation (Rogers, 1995). We determined that our resources would need to provide an opportunity for speech-language pathology students to apply UDL knowledge to meet the requirement of trialability.

Table 1	
Framing of the Educational Resources Through the Five Characteristics of Innovations	
Innovation characteristic	Recommendations and incorporation of innovation characteristic into educational resources
Relative Advantage: The degree to which an idea or innovation seems superior compared to the idea or innovation that came before it.	<ul style="list-style-type: none"> Advantages of adopting and UDL benefits should be portrayed. Examples: UDL tackles curriculum barriers and provides supports; UDL motivates students and increases participation; and UDL benefits all students, not just those who are on an S-LP's case load.
Compatibility: The extent to which an idea or innovation is consistent with current beliefs, values, and social norms.	<ul style="list-style-type: none"> Compatibility of UDL with S-LP practice should be emphasized using examples from the literature; Ontario Ministry of Education supports and encourages usage of UDL as an instructional approach.
Complexity: How easy or difficult it is for individuals to perceive and apply a new idea or innovation.	<ul style="list-style-type: none"> Resources should be designed to be administered during students' regular class time. Resources should include basic definitions, tables, diagrams, and videos.
Trialability: The ability to try out the innovation or idea.	<ul style="list-style-type: none"> Students should have the opportunity to trial and apply UDL. Students should be provided with a guided practical example of how to apply the UDL Guidelines.
Observability: The ability to visibly see the results of an innovation or idea.	<ul style="list-style-type: none"> Resources should include examples of S-LPs successfully using UDL (e.g., include quotations from school-based S-LPs and examples of S-LPs using UDL from the literature).

Note. UDL = Universal Design for Learning; S-LP = speech-language pathologist. Information for innovation characteristics adapted from Rogers (1995), for incorporations in educational resources from Kennedy, Missiuna, Pollock, Wu, Yost, and Campbell (2018); Lieberman, Lytle, and Clarcq (2008); and the Ontario Ministry of Education (2013).

DOI theory also includes five adopter categories describing those individuals who are likely to adopt an innovation over time (Rogers, 1995). **Table 2** describes these adopter categories and provides examples of considerations made for each. For example, the late majority and laggard categories are groups that require more persuasion through evidence and examples of the innovation's success. Thus, we included evidence, policy documents, and examples of S-LPs applying UDL to tailor our resources to the adopter categories.

DOI theory also considers the time it takes for an individual to form an opinion of an innovation, called the innovation-decision process, which comprises five steps (Rogers, 1995). We focused on the first two steps of this process, knowledge and persuasion, to identify strategies to influence the decision process. We determined that *knowledge* would be addressed through provision of basic UDL definitions and explanations through text, diagrams, and videos in the resources. *Persuasion* was addressed through portraying evidence supporting UDL and UDL's compatibility within the education system in Ontario, Canada.

To incorporate the communication channel element of DOI theory (Rogers, 1995), we asked practising school S-LPs to prepare messages about the innovation as they are individuals who likely have similar qualities, beliefs, and education as the speech-language pathology students. In so doing, we also addressed the social system in which speech-language pathology students are being inculcated. Rogers (1995) suggested that adoption is supported by incorporation of opinion leaders and change agents, who are viewed as having the power to shift beliefs regarding an innovation. Opinion leaders were represented by describing Ontario Ministry of Education documents that situate UDL as a framework to support all students' learning. Change agents were represented by including supportive quotations from school S-LPs.

Drafting of educational resources. Three types of educational resources were drafted: a PowerPoint presentation, two case studies, and two S-LP-tailored handouts outlining strategies to implement UDL. We developed learning objectives using Bloom's Taxonomy of Instructional Objectives (Forehand, 2005; University of New Brunswick, n.d.). We consulted the DOI theory mapping

Table 2**Incorporation of the Five Adopter Categories into Educational Resources**

Adopter category	Examples used to target adopter category in educational resources
<p>Innovators: The individuals who want to be the first to try out an innovation. They are visionaries, imaginative, and willing to take risks.</p>	<ul style="list-style-type: none"> • Innovators are the school-based S-LP working group members who assisted with resource development. • Quotes from working group members show students that there are S-LPs using UDL successfully.
<p>Early Adopters: These are individuals who influence change and adoption of innovations. They are typically trend setters, enjoy leadership roles, and have money and time to invest in the innovation.</p>	<ul style="list-style-type: none"> • Early Adopters are speech-language pathology students who have worked or completed placements within the schoolboard and have an interest in becoming a school-based S-LP. Promote sharing of stories and enthusiasm for UDL by inviting students who have been exposed to UDL to share their experiences.
<p>Early Majority: These individuals are typically not found within leadership roles, but they are faster to adopt innovations than the typical person. These individuals require rationale and proof to adopt the innovation and respond well to simplicity of innovations. They will only adopt an innovation if they feel it has real benefits.</p>	<ul style="list-style-type: none"> • Demonstrate rationale for using UDL, how to apply UDL, and available evidence about UDL. • Ensure resources are simple and easy to understand.
<p>Late Majority: These individuals are more cautious towards new ideas and innovations. They usually only adopt an innovation after seeing it used by peers. When working with them, it is important to focus on social norms and emphasize the risk of being left behind.</p>	<ul style="list-style-type: none"> • Highlight social norms by providing examples of how other S-LPs are using UDL, emphasizing UDL adoption by Ministry of Education, providing opportunity to apply UDL in class, and having a longer version of the S-LP-tailored UDL guidelines handout that provides an extensive list of practical examples.
<p>Laggards: These individuals typically will not adopt an innovation. They are very conservative and do not try new things. When working with them, address their criticisms and show how other laggards have successfully adopted UDL.</p>	<ul style="list-style-type: none"> • Similar to Late Majority but ensure adequate time is provided to address any questions or criticisms these speech-language pathology students may have regarding UDL.

Note: S-LP = speech-language pathologist; UDL = Universal Design for Learning. Information for adopter categories adapted from Rogers (1995) and Borough (2017).

tables when beginning the drafting process (see **Tables 1 and 2**). UDL strategies that had been extracted from the articles identified by Kennedy et al. (2018) were formatted and displayed in two handouts using the UDL Guidelines template (Center for Applied Special Technology, 2018). With the late majority adopters in mind, one handout was extensive and included all strategies extracted from the literature, while the other handout was abbreviated and included salient examples for the earlier adopter categories (see **Table 2**).

Development Phase

In this phase, we recruited school S-LP stakeholders to form a working group that would assist in resource development. We specifically sought S-LPs who were practising in a school setting, were geographically close to

McMaster University, and had an interest in UDL. Potential working group members were identified and contacted by a third party using a secure database that housed contact information of local S-LPs. The final working group included three school S-LPs who had familiarity with UDL. Among them, members had a median of 29 years of clinical experience (range = 18 to 29 years) and a median of 29 years of experience in the school setting (range = 12 to 29 years). They received compensation for parking fees and a \$100 gift certificate for their participation.

We held two 90-minute working group meetings 6–8 weeks apart. Prior to each meeting, members received an agenda and a set of resource drafts to review. Working group members provided suggestions, such as describing Ontario Ministry of Education documents in the PowerPoint, explicitly linking Ministry terminology with the terms

used in the UDL framework, and revising case studies to include authentic S-LP scenarios based on their personal experiences working with students and educators. Between meetings, the authors re-entered the Design phase to incorporate the feedback and create new content. A small group of McMaster faculty and staff who volunteered to attend a “trial run” of the educational session provided feedback on the final set of products. The final educational resources included a 55-slide PowerPoint presentation, two case studies, and two S-LP-tailored UDL strategy handouts.

Stakeholder Feedback

Since this was a novel resource development process, we conducted a 30-minute focus group after the second working group meeting to gather perceptions on employing this process and inclusion of stakeholders (see Appendix for the complete focus group instructions and guide). The focus group was audio recorded and transcribed verbatim.

Focus group data analysis. Focus group responses were analyzed using conventional content analysis, which is used to describe a phenomenon or explain participant reactions (Hsieh & Shannon, 2005). Conventional content analysis is appropriate when existing theory or literature regarding the phenomenon is limited, as is the case in this paper using a novel process of resource development (Hsieh & Shannon, 2005). With this type of analysis, researchers do not use predetermined coding categories, but instead, they identify categories that emerge from the data. The transcript was first coded using descriptive coding by VT (first author) and reviewed by WC (fourth author). Descriptive coding is when the researcher identifies words or short phrases that represent and summarize that portion of the data (Saldaña, 2016). After the process of coding, all codes were categorized into topics based on their similarities determined by VT and WC. First, VT identified the topics, which were then reviewed and agreed upon by WC.

Focus Group Content Analysis Findings

All three working group members participated in the focus group. Three topics were identified from the focus group: value and appreciation, enriching and positive meetings, and importance of the development process.

Value and appreciation. Through inclusion of school S-LPs in this process, members felt that their opinions were valued. As one member stated, “...any feedback that we gave was really positively accepted, clarification was asked if they were unsure of what we meant. It seemed like we were really quite involved in the participation, yeah. Quite valued.” Members also indicated that researchers involved

in the meetings were responsive, incorporating stakeholder feedback into the resources, further making them feel appreciated and valued during the development process.

Enriching and positive meetings. Members emphasized the orderly structure of both meetings, adhering to pre-determined agenda items and the allocated timelines. Members felt that the collaborative discussions lead to a positive experience. One member spoke to the nature of the discussions stating, “it meant we could build on each other’s ideas, which I think overall enhanced the learning and the suggestions...it was also helpful to have other people who could echo or broaden or deepen some of the comments and understandings.” As well, members felt that having the meetings in-person contributed to the productiveness and efficiency of each meeting. Members also mentioned how meetings raised their awareness of knowledge gaps involving S-LP practice. For example, one member remarked, “I think the other thing it does is it shows what we don’t know perhaps. Or helps us to know what we need to brush up on, or perhaps re-visit so that we’re really current with our practices and our thinking.”

Importance of the development process. Members stated the importance of including practising S-LPs in the resource development process. One member brought attention to creating resources that are important and relevant to the target population saying, “I think it’s really important that the resources that we’re giving student clinicians or people who are new to the field reflect what they’re actually going to see once they’re out working.” One member recommended this process for development of future resources saying, “I think so because it’s realistic. It’s connected to reality – to what people really are experiencing in the field...Talk to the people who are actually in the field and get their responses.” There was a consensus among members regarding the importance of engaging stakeholders throughout the development process and how this enhanced the resource quality.

Section Two: Pilot Evaluation with S-LP Students

Implementation and Evaluation Phases

To achieve our aims for section two, we drew upon the final two phases of the ADDIE model: Implementation and Evaluation. Briefly, implementation involved administering the resources to the S-LP students, while evaluation involved assessing resource feasibility and perceived and actual UDL knowledge change among the S-LP student cohort. Together, implementation and evaluation constituted steps three and four in the ADDIE instructional design process.

Participants

Using the same ethics approval from section one of this study, we sought participants from a convenience sample of 28 graduate students completing their pediatric unit in their first year of McMaster University's Speech-Language Pathology Program. Of the 28 students eligible to participate, 15 voluntarily completed an anonymous pre-questionnaire prior to implementation of the educational resources. Nineteen students attended the class during which the educational resources were delivered. Following delivery of the educational resources, 10 students voluntarily completed an anonymous post-questionnaire. Of these students, eight had matching pre-questionnaires. Only seven of the eight respondents completed the actual UDL knowledge open-ended question.

Materials

Educational resources. Resources included the multimedia PowerPoint presentation, two case studies, and two UDL guideline handouts. The PowerPoint presentation provided a definition of UDL, an overview of the UDL guidelines, Ontario Ministry of Education documents that recommend UDL, evidence that supports UDL with acknowledgment of gaps, and examples of UDL strategies implemented by S-LPs. The two case studies illustrated how S-LPs could apply the UDL guideline strategies in a classroom setting. The UDL guideline handouts included strategies specific to S-LPs, which as noted previously, had been extracted from a published scoping review (Kennedy et al., 2018). Students received an abbreviated version for use with the case studies and an extensive version for future reference.

Questionnaires. The pre-questionnaire inquired about students' general awareness of the term UDL, experience working in school settings, and knowledge of UDL. The post-questionnaire repeated the questions about knowledge of UDL and probed students' perceptions of the resources as practical and acceptable, both of which are aspects of feasibility (Bowen et al., 2009). Both questionnaires included a mixture of closed- and open-ended items. Closed-ended items were phrased as a statement with students using a 7-point scale to rate their agreement with the statement, where 1 corresponded to *strongly disagree* and 7 to *strongly agree* (Dillman, Smyth, & Christian, 2014; Göb, McCollin, & Ramalhoto, 2007). All questionnaire items were reviewed independently by the authors for face validity (Lavrakas, 2008).

Practicality. Practicality refers to the time, efficiency, and overall usefulness of resources (Bowen et al., 2009). Students responded to three questions about the time

allocated to each resource and three questions about the usefulness of content. They also nominated the most and least helpful resources, including the reason for their selection.

Acceptability. Acceptability refers to the overall attractiveness, quality, and suitability of resources (Bowen et al., 2009). Students responded to eight questions about resource quality, visual attractiveness, and understandability of information. They also answered nine questions about the relative importance of content included in the resources based on DOI theory.

Perceived and actual UDL knowledge. Eleven questions asked students about their perceived knowledge of UDL. Actual UDL knowledge was examined using an open-ended question where participants were asked to describe their understanding of UDL: "Please provide a brief description of your current understanding of UDL."

Procedure

The first author delivered the educational resources during a 3-hour class as part of the students' regular coursework. The PowerPoint presentation was delivered first and included opportunities for discussion and a guided example of how to apply UDL. Next, students received the abbreviated UDL guideline handouts and the two case studies. Working in small groups, students explored the cases and then shared their responses during a facilitated class discussion.

We administered questionnaires through Research Electronic Data Capture (REDCap) software housed on a secure network at McMaster University (Harris et al., 2009). We shared a link to the pre-questionnaire 1 week before and to the post-questionnaire for 1 week after resource implementation. Students received one reminder for each questionnaire. Students generated their own unique identifier; thus, no identifying information was collected.

Data Analysis

We used STATA/IC Version 15 to analyze numerical data. Medians and interquartile ranges (i.e., the difference between the 25th and the 75th percentile; IQR) estimated central tendency and variability, respectively. We compared students' pre- and post-ratings of their perceived knowledge of UDL using the Exact Wilcoxon Signed Rank test (Harris & Hardin, 2013) with two-tailed probability and significance level of .05. We applied a manifest approach to content analysis to determine the frequency with which students used words associated with UDL in their responses to open-ended questions (Cash & Snider, 2014; Graneheim,

Lindgren, & Lundman, 2017; Potter & Levine-Donnerstein, 1999). To determine words associated with UDL, VT and WC identified key words used to describe UDL as defined by the Center for Applied Special Technology (2018). VT conducted a manifest approach to content analysis through a frequency count of these key words in students' responses to the open-ended question that asked students to describe UDL in their own words. WC reviewed VT's frequency counts for accuracy.

Results

Practicality

As shown in **Table 3**, participants ($n = 10$) perceived the resources to be practical as indicated by median scores of either 6 or 7 for all items. The IQRs fell in the upper end of *neutral* to *strongly agree*, with small IQR differences indicating minimal response variability. When asked to rank order the resources from most to least helpful, six participants rated the S-LP-tailored UDL guidelines as most helpful, followed by the case studies ($n = 5$), and the PowerPoint presentation ($n = 3$). Three participants chose more than one resource as most helpful. Participants stated that the UDL handouts were valued because they addressed application of UDL, included examples, and were a resource for future practice. Participants similarly valued the case studies for their focus on application as well as their stimulation of discussion. Participants described the PowerPoint as visually appealing but repetitive.

Acceptability

As displayed in **Table 4**, all participants ($n = 10$) perceived the resources to be acceptable. Across these eight items, median responses were all 7, which

corresponded to strongly agree on the rating scale. IQRs were in the upper end of *neutral* and *strongly agree*, indicating minimal response variability. As shown in **Table 5**, participants ($n = 10$) perceived that content tailored using DOI theory was important and relevant, such as including examples and quotes of S-LPs applying UDL. Medians were in the *strongly agree* category with IQRs from *neutral* to *strongly agree*. The exception was an item that asked about the importance of including quotes from school-based S-LPs about the value of UDL to school-based practice. For this question, participants endorsed a neutral median value of 4.5.

Perceived UDL Knowledge

As shown in **Table 6**, the 25th and 75th percentiles corresponded to higher values (e.g., *neutral* and *strongly agree*) in the post-questionnaire relative to the pre-questionnaire. IQR differences also decreased in post-questionnaire data compared to pre-questionnaire, indicating a decrease in response variability. This suggested that participants felt they were more knowledgeable about UDL after exposure to the educational resources. This observation was verified by the Exact Wilcoxon Signed Rank test, which showed a statistically significant difference in pre- and post-responses ($p = .001$; $S = 33.00$).

Actual UDL Knowledge

As shown in **Table 7**, relative to participants' descriptions of UDL on the pre-questionnaire, they increased their use of words associated with how the Center for Applied Special Technology defined UDL on the post-questionnaire, such as "guidelines," "checkpoints," and using terminology that corresponds to the three UDL principles (e.g., multiple

Question	Median (IQR)
"Time allocated to PowerPoint was appropriate."	6 (6,7)
"PowerPoint provided the right amount of information."	6 (5,7)
"Time allocated to completing case studies was appropriate."	6.5 (6,7)
"Case studies provided real-life situations."	7 (6,7)
"Time allocated to exploring Universal Design for Learning guidelines handout was appropriate."	6 (5,7)
"Applying the handout to the case study was useful."	6.5 (6,7)

Note. IQR = Interquartile range.

Table 4
Students' Perceptions of Resource Acceptability (n = 10)

Question	Median (IQR)
"PowerPoint provided new information on UDL."	7 (7,7)
"PowerPoint was easy to follow."	7 (6,7)
"Good mixture of visual representation of content."	7 (6,7)
"Case study descriptions provided appropriate detail."	7 (5,7)
"Case studies were easy to follow."	7 (5,7)
"Handout was manageable to use with case studies."	7 (6,7)
"Handout provided sufficient S-LP examples."	7 (6,7)
"Instructions on how to use the UDL guidelines with the case studies were easy to understand."	7 (6,7)

Note. IQR = Interquartile range; UDL = Universal Design for Learning; S-LP = speech-language pathology.

Table 5
Students' Perceptions of Content Informed by DOI Theory (n = 10)

Question	Median (IQR)
"It was important to me that..."	
"the presentation included quotes from school-based S-LPs and how they applied UDL."	4.5 (4,5)
"the presentation included a summary of current research evidence about UDL."	6 (5,7)
"the presentation explained how UDL is compatible with the Ministry of Education's Learning for All document."	6 (5,6)
"the presentation mentioned the potential benefits of UDL."	7 (6,7)
"I had an opportunity to apply the UDL Guidelines to the case studies."	6.5 (6,7)
"I had a longer version of the UDL Guidelines to take away."	7 (6,7)
"we had a group discussion about the case studies and UDL Guidelines to observe how my peers would apply UDL."	6 (6,7)
"the UDL Guidelines handout had practical examples of how S-LPs can use UDL in their clinical practice."	7 (6,7)
"the American Speech-Language-Hearing Association supports a role for S-LPs in using UDL in schools."	6.5 (6,7)

Note. DOI = Diffusion of Innovations; IQR = Interquartile range; S-LP = speech-language pathologist; UDL = Universal Design for Learning.

means of representation). This suggests that participants were more accurate in their description of UDL after attending the class session. It also is important to note that in the pre-questionnaire several participants used general phrases that are associated with UDL, such as "accessible"

and "equal/equity." In the post-questionnaire, students' use of these terms decreased and their use of terms specific to UDL increased.

Table 6**Students' Perceived Knowledge of UDL Before and After Resource Implementation (n = 8)**

Question	Before Median (IQR)	After Median (IQR)
"I can name the 3 UDL principles."	2 (1,3)	7 (7,7)
"I can define the first UDL principle."	2 (1,4)	6.5 (6,7)
"I can define the second UDL principle."	2 (1,4)	6.5 (6,7)
"I can define the third UDL principle."	2 (1,2)	6.5 (6,7)
"I can explain the importance of UDL for S-LPs who work in schools."	5 (4,5)	7 (6,7)
"I can explain the UDL guidelines."	2 (1,2)	6 (5,6)
"I can apply the UDL guidelines to case studies."	2 (2,2)	6 (5.5,6.5)
"I can choose appropriate UDL strategies to apply in case studies."	3 (1,4)	6 (6,7)
"I can list at least 2 potential benefits of UDL application in the classroom."	5 (4,6)	7 (6,7)
"I can paraphrase current evidence regarding use of UDL by educators and S-LPs."	1 (1,2)	6 (5,6)
"I can explain why there is a need for more evidence about UDL implementation by S-LPs."	3 (2,6)	6.5 (6,7)

Note. IQR = Interquartile range; UDL = Universal Design for Learning; S-LP = speech-language pathologist.

Table 7**Students' Actual Knowledge of Universal Design for Learning**

UDL key words	Word count pre-questionnaire (n = 15)	Word count post-questionnaire (n = 7)
Principle	1	3
Guidelines	0	3
Action and Expression	1	3
Engagement	0	3
Representation	1	3
Accessible	6	3
Equal/equity	6	2
Checkpoint	0	2
Framework	1	1

Note. UDL = Universal Design for Learning.

Discussion

Given the mandate for inclusive education in Canada (Inclusive Education Canada, 2017; Ontario Ministry of Education, 2013; Towle, 2015), S-LPs need to be informed about inclusive education practices and frameworks like UDL (Suleman et al., 2013). S-LPs have identified a need for education and training on the topic of UDL (Campbell et al., 2016), with speech-language pathology students constituting an important audience to target (Suleman et al., 2013). To our knowledge, researchers have yet to develop resources to teach speech-language pathology students about UDL nor has anyone evaluated the feasibility of doing so.

With respect to our findings, it may seem unusual that the 15 students who completed the pre-questionnaire had all heard of UDL prior to resource implementation, and that some were able to accurately describe UDL in open-ended question responses, especially given Campbell et al.'s (2016) report that many practising S-LPs did not know this term. This finding may reflect McMaster University's approach to graduate education where faculty implement UDL in their own teaching. Therefore, students' general awareness of the term UDL may be explained by their previous exposure to its use by faculty. Less surprising, however, was our finding that most students did not feel confident in their ability to explain UDL or how to apply it to a clinical situation. This may reflect the fact that students had not been exposed to a full explanation of the UDL framework and may not have thought about UDL through the lens of their future clinical practice. In this respect, the speech-language pathology students in this study appeared similar to their counterparts in practice, who when surveyed in 2016, had reported lacking confidence in their ability to explain how UDL was relevant to their role in the schools or in applying it in their collaborations with educators (Campbell et al., 2016).

As enhancing knowledge about UDL was a key reason for conducting this study, it was encouraging that we detected statistically significant change in students' perceived knowledge of UDL. We found that with 3 hours of instruction, students felt more confident in their knowledge of UDL and in their ability to apply UDL in the context of a case study. Participants were also able to identify key gaps in the evidence base, such as lack of high-quality research and inconsistent usage of UDL terminology across fields and studies. Thus, our findings suggest that our resources may be able to address a previously unmet need to increase S-LPs' knowledge of UDL (Campbell et al., 2016).

Another important finding from this study is reflective of our approach to developing the resources. Within the field

of KT, theory-driven studies are lacking and approaches that enhance dissemination strategies are needed (Curran et al., 2011; Eccles et al., 2005; Tabak et al., 2012). Students' perception of our resources as practical and acceptable suggests that we were successful in tailoring them to this population. Speech-language pathology students valued resource content informed by DOI theory (Rogers, 1995) and reported the handout and the case studies to be most helpful. These resources were included because DOI theory emphasizes the importance of trialling new ideas and being able to observe others do the same (Rogers, 1995). This suggests that using theories, like DOI, when developing resources may facilitate knowledge uptake, an observation that is consistent with research in knowledge translation (Eccles et al., 2005; Tabak et al., 2012).

Levac et al. (2015) provided recommendations for developing and implementing online KT resources for health professionals. They suggested that developing resources requires assessment of audience needs, summarizing key evidence, use of KT theory, selection of KT format, and inclusion of multimedia content to enhance visual appeal and engagement (Levac et al., 2015). Our process of combining ADDIE and DOI theory followed their recommendations and extended their work by providing a descriptive methodology of the process, including stakeholder involvement. The process of engaging S-LP stakeholders throughout the ADDIE Development phase enriched the resource content. These experienced school S-LPs had practical knowledge and experience regarding the role of S-LPs within schools and specific policies and terminology that are valuable for pre-professional S-LPs.

Our study also showcases the value in researcher-clinician collaborations for research, teaching, and training. Researcher-clinician collaborations provide the skillsets and experiences of both the researcher and clinician to enhance evidence-based practice to lead to desired outcomes, as highlighted in KT literature (Glasgow et al., 2012; Goldstein, McKenna, Barker, & Brown, 2019; Olswang & Goldstein, 2017). Olswang and Goldstein (2017) suggested that to make a lasting and impactful change on current practice, researcher-clinician collaborations should be used throughout development of evidence-based protocols. Through collaborating with school S-LPs and including them in the development of the educational resources, we developed evidence-based resources that encompass current school S-LP practice to enhance training and outcomes for future school S-LPs. Other clinicians and researchers looking to develop evidence-based KT products could benefit from these collaborations to ensure developed products are relevant and meaningful to the target population.

Limitations

Feedback on employing this novel development process was limited as there were only three working group members representing perspectives from two school boards. We also had a homogenous sample of S-LPs who all knew each other well. This could provide an unrealistic expectation that future working groups would be as comfortable and willing to discuss and share ideas as was ours. S-LP stakeholders were also familiar with and invested in UDL. We may have received different input had UDL knowledge, interest, and experience differed among members. Regardless, stakeholders provided useful and valuable feedback during working group meetings, which informed the final products. The process to develop the resources was also a time and labor-intensive process that required mapping and applying the DOI elements; however, through meticulously considering every applicable DOI element, each resource component had a purpose and was grounded in theory.

As implementing these resources was done through a pilot study, our findings are not generalizable. With only seven students completing the open-ended question about actual UDL knowledge, in only one to two sentences, we cannot infer that resources changed actual knowledge. Although we had hoped to recruit larger numbers, resource implementation occurred just prior to student examinations, which may have negatively impacted recruitment. Second, self-selection bias may have contributed to the overall positive response to our educational resources (Lavrakas, 2008). The students who participated may have been those most receptive to UDL or who felt most positive about our session. Finally, participants did not complete the questionnaires in a controlled environment; therefore, students may have consulted resources about UDL during questionnaire completion.

Future Research

Engaging stakeholders at the very beginning of the development process, instead of only during resource development, would be useful to help determine the types of educational resources to be developed, and learning objectives and core material to be included. Future research also could explore how this novel approach combining DOI theory and the ADDIE model could be applied in the development of other educational resources. Inclusion of larger and more diverse working groups with other health professionals could evaluate the usefulness of this methodology for developing educational resources across disciplines.

Ideally, our educational resources would be implemented with an additional cohort of students to

re-assess feasibility. To truly grasp if students retained or learned new information about UDL, a mandatory assignment or in-class quiz could be added to complement existing evaluation methods. The addition of a control group would help determine the effectiveness of the educational resources as a mechanism to change UDL knowledge. Soon, implementation of these resources could also be video-recorded and made easily accessible online for S-LP educators to enhance future use and implementation of the resources.

Conclusion

Overall, we believe the steps of this novel methodology could prove useful to other educators or researchers needing to develop educational resources. Although the process was time consuming, final educational products followed best-practice recommendations (Levac et al., 2015). Those looking to develop content-specific approaches could benefit from a similar methodology and the opportunity to engage their clinical community. With an increased emphasis on developing theory-driven dissemination strategies (Scott et al., 2012; Squires et al., 2014), this paper adds to the literature base by describing and illustrating a novel systematic process for developing quality educational resources for S-LP students.

We also evaluated the feasibility of these newly created educational resources about UDL for speech-language pathology students as well as changes to students' knowledge of UDL. With the shift towards inclusive education in Canada (Towle, 2015), future school-based health professionals need to be able to implement inclusive practices, collaborate with educators, and provide the necessary supports for all students to succeed. This study is a step towards decreasing a gap in UDL knowledge among the S-LP community (Campbell et al., 2016).

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Appendix Focus Group Guide

Instructions Given to Participants

As a part of employing this novel development process, we want to learn about your perspectives as members of this Working Group. We want to better understand your overall experience in helping to design these educational resources. We want to understand your thoughts about the working group meetings, and if you felt following this process and participating in designing the resources was meaningful and useful. We encourage everyone to participate; you might have different opinions and feedback and we are interested in capturing the variety of responses and opinions of all working group members. This is a safe environment and all comments and feedback are welcome.

To ensure confidentiality, we ask that you do not share any information discussed here outside this room. To capture the discussion accurately, we will be recording our discussion. However, the information that you share will be used only for research purposes and will remain confidential. We will provide a written summary of our findings to each one of you, as well as further study results after completion of Phase 2 and utilization of the resources that you all helped to design!

Do you agree to be recorded? YES NO

This interview will explore three major themes:

1. Your perception of being a part of the design process of these education resources.
2. Your perception in the flow and methodology of each working group meeting.
3. Your suggestions and specific comments regarding pros and cons of the process.

Do you consent to participate in this focus group? YES NO

Do you have any questions before beginning the interview?

Questions Asked to Participants

1. Can you tell me about your overall experience in being a part of this Working Group?
2. What did you especially enjoy during each meeting?
3. What would you have changed or added to each meeting?
4. How did you feel about being a part of designing these educational resources?
5. Did you find the meetings to be an effective way in helping provide feedback to develop these resources?
6. What were the benefits of the process we followed?
7. Were there any drawbacks or challenges in the process that we followed?
8. Would you recommend this as a process for developing instructional resources? Why or why not.
9. Do you have any additional comments or remarks to add?

Thank you for your collaboration.



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