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REVUE CANADIENNE D'ORTHOPHONIE ET D'AUDIOLOGIE | RCOA

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La communication à coeur

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ÉQUIPE DE RÉDACTION

Deux des articles publiés dans ce numéro de la revue canadienne d'orthophonie et d'audiologie, soit « Comparaison des échantillons de langage longs et courts : une procédure clinique pour l'évaluation du langage en français » et « Les dialectes non-standards et le rendement scolaire : les répercussions potentielles pour les élèves des Premières Nations », ont été soumis - et initialement révisés par les pairs - alors que l'équipe de rédaction suivante était en place :

RÉVISEURS DE LA RCOA

Claire Croteau, Richard J. Welland, Hillel Finestone, Carly Barbon, Ellen Hickey, Sven Joubert, Laura M Monetta, Susan Small, Anne Hill, Narelle Patton, Ferenc Bunta.

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KEY WORDS

LANGUAGE SAMPLE ANALYSIS
SAMPLE LENGTH
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LEXICAL DIVERSITY

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Abstract

Introduction: Language sample analysis (LSA) is a main method of evaluation of children's language production in both research and clinical contexts, providing unique insights that differ from those of formal tests. In spite of available procedures for LSA in French, their clinical use is low in Quebec.

Purpose: With a view to making LSA in French a more realistic clinical procedure, this study examined the effect of sample length on French LSA measures of both children with typical development (TD) and children with language impairment (LI). Effects of length were examined on global measures, such as Mean Length of Utterance (MLU) and detailed measures of morphological diversity.

Method: Conversational language samples collected within several previous studies using the same method were pooled, including samples from 124 children with TD and 25 children with LI, divided into 5 age groups from 2 to 6 years. All children were monolingual speakers of Quebec French. Results of sample lengths of 100, 50, 25, and 12 utterances were compared.

Results: Remarkable stability was found for all measures across sample lengths of 100, 50, 25, and (to a lesser degree) 12 utterances. MLU in words and morphemes were nearly perfectly correlated in both the TD and the LI samples. Greater morphological diversity and a greater number of word types and tokens were seen in longer samples, but differences between sample lengths were systematic. Based on high correlations for all LSA measures between sample lengths, a clinical shortcut procedure was proposed, involving the use of Mean Length of Utterance in words (MLUw) derived from a carefully collected sample of 25 utterances to estimate the more complex language use reported in accumulated descriptive data for 100 utterance samples. The study provides data that can serve as a clinical reference for LSA in Quebec French-speaking children with TD and with LI.

Abrégé

Introduction : L'analyse des échantillons de langage (AÉL) est l'une des principales méthodes d'évaluation de la production de langage d'un enfant, tant en recherche qu'en clinique. Cette méthode d'évaluation fournit des informations uniques qui diffèrent des informations recueillies avec les tests formels. Quoique des procédures d'analyse pour les échantillons de langage soient disponibles en français, elles sont peu utilisées en clinique au Québec.

Objectif : Ayant pour objectif de fournir une procédure clinique plus réaliste avec l'AÉL, cette étude examine l'effet de la longueur des échantillons sur les mesures de l'AÉL chez des enfants au développement typique (DT) et des enfants avec un trouble du langage (TL). L'effet de la longueur sur les mesures globales (telles que la longueur moyenne de l'énoncé, LME) et sur les mesures plus détaillées de la diversité morphologique a été examiné.

Méthodologie : Les échantillons de langage conversationnel utilisés dans cette étude ont été recueillis dans le cadre de plusieurs études antérieures qui utilisaient la même méthode d'analyse. Les échantillons de 124 enfants au DT et de 25 enfants TL ont été inclus. Les enfants ont été divisés selon 5 groupes d'âge, de 2 à 6 ans. Tous les enfants étaient des locuteurs franco-québécois unilingues. Une comparaison d'échantillons de différentes longueurs, composés de 100, 50, 25 et 12 énoncés, a été effectuée.

Résultats : Les résultats montrent une stabilité considérable des mesures entre les échantillons composés de 100, 50, 25 et (à un moindre degré) 12 énoncés. Les LMÉs en mots et en morphèmes sont presque parfaitement corrélées, tant dans les échantillons des enfants au DT que dans ceux des enfants avec un TL. Une plus grande diversité morphologique, un plus grand nombre total de mots et un plus grand nombre de mots différents ont été observés dans les échantillons plus longs, mais les différences étaient systématiques entre échantillons de longueur différente. En s'appuyant sur les corrélations élevées retrouvées entre les mesures de l'AÉL pour les diverses longueurs des échantillons, une procédure clinique plus courte a été proposée. Cette procédure utilise la longueur moyenne des énoncés en mots, dérivée à partir d'un échantillon de 25 énoncés, pour estimer l'utilisation plus complexe du langage rapportée dans les données descriptives accumulées à partir d' échantillons de 100 énoncés. L'étude fournit des données pouvant servir de référence clinique pour l'AÉL chez des enfants franco-québécois au DT et avec un TL.

Language sample analysis (LSA) has a long-standing history as a main method of assessment of children's language development. In a review of the principal clinical uses of LSA with English-speaking children, Heilmann, Miller, and Nockerts (2010) point out that it has been used systematically for over 50 years, and has served as the basis for much of our current knowledge on children's typical language production, as well as of the way language production breaks down in children presenting with, or at risk for, language impairment. This article focuses on a commonly used LSA procedure, which, following the work of Brown (1973), uses the child's average utterance length as a yardstick of global language level, based on the observation that increased language skill leads to longer utterances. This has been shown with conversational samples for preschool children, and with conversational and, more clearly, with narrative samples for older children (Brown, 1973; Leadholm & Miller, 1992; Scarborough, Wyckoff & Davidson, 1986).

Mean length of utterance can be computed as the average number of words per utterance (Mean Length of Utterance in words, MLUw). Alternatively, by coding certain grammatical morphemes and including them in the length count, the yardstick (Mean Length of Utterance in morphemes, MLUm) reflects not only children's ability to string together an increasing number of words, but also their growing ability to use grammatical morphology. This coding also allows analysis of children's morphological development. In Brown's (1973) analysis of English, the morphological coding involves a set of 14 grammatical morphemes known collectively as Brown's morphemes; these are associated with Brown's five stages of morphological development. Standard LSA measures also include lexical measures and measures of verbal fluency. Lexical measures include total number of word tokens (TW), total number of different word types (TDW), used to estimate vocabulary size as well as verbal fluency, and the ratio of these (type-token ratio, TTR, or TDW/TW). The number and size of mazes is another measure of verbal (dys)fluency. Mazes are defined as material that does not contribute to conveying the message of the utterance, such as fillers, repetitions, and reformulations. The Systematic Analysis of Language Transcripts (SALT) software (Miller, Andriacchi & Nockerts, 2011) was developed expressly to yield these measures in English and contains normative data to help interpretation; however, the analysis can also be performed by hand. The analysis procedure used in this study was developed as a French adaptation of the SALT procedure; the French coding procedures can be found in Elin Thordardottir (2005) and in the online version of the SALT manual (Miller et al., 2011).

LSA in French

Language sample analyses are found in many cross-linguistic studies of language development and language impairment, often for the purpose of analyzing particular linguistic elements or error types. Detailed morphological coding procedures have also been developed in a number of languages, permitting the computation of MLUm (e.g. Arlman-Rupp, Van Niekerk de Haan & Van de Sandt-Koenderman, 1976; Elin Thordardottir & Ellis Weismer, 1998; Hickey, 1991; Miller et al., 2011); however, languages vary in the extent to which LSA procedures have been developed for or are commonly found in clinical use.

In French, the language of interest in the present study, longitudinal language sample corpus data on individual children have been collected and analyzed by several researchers, providing crucial information on the sequence of development of various grammatical structures in young children and of the development of various word classes (e.g. Bassano, 2000; Bassano, Maillochon, Klampfer & Dressler, 2001; Morgenstern & Parisse, 2007). An LSA method for French was presented by Rondal (2003), with data for a single child spanning ages 2 to 3 years. Rondal's procedure included a detailed analysis of inflectional grammatical morphology that was similar, although not identical, to the procedure used in this study. Le Normand, Parisse, and Cohen (2008) reported normative data on 316 Parisian French children in nine age groups, ranging from 24 to 48 months. Measures included MLUw and vocabulary diversity (TW, TDW, and TTR) derived from 20-minute samples collected with a familiar adult. In addition, an automatic tagger was used to identify certain grammatical word classes. French language sample data have also been used to develop an adaptation of Language Assessment, Remediation, and Screen Procedure (LARSP) analysis (Maillart, Parisse & Tommerdahl, 2012), which focuses on phrase structure and morphology. All of these analysis methods have been shown to be sensitive to language development in French-speaking children, supporting their relevance for clinical application.

The analysis method used in this study was developed over a decade ago as a French adaptation of SALT coding procedures (Elin Thordardottir, 2005); however, SALT conventions were not applied directly, but rather, a parallel procedure was developed based on similar principles, taking the structural characteristics of French into account. The first data set analyzed with the French SALT procedure showed that young Quebec French-speaking children (18 to 47 months) had higher MLUms than English-speaking age mates and used more complex morphology with fewer

errors; however, their vocabularies were smaller than those of the anglophones, whether measured by LSA or by parent report (Quebec French version of the McArthur-Bates CDI, Trudeau, Frank, & Poulin-Dubois, 1999). Over the last decade, the procedure has been used in various studies of children with typical development (TD) and language impairment (LI) conducted within the same research lab (Elin Thordardottir, 2015; Elin Thordardottir, Kehayia, Lessard, Sutton & Trudeau, 2010; Elin Thordardottir et al., 2011; Elin Thordardottir & Namazi, 2007). A unique aspect of this analysis system compared to other existing LSA procedures for French is that it provides a detailed focus on productive morphology and its relationship to MLU, in a sense replicating the tradition of Brown's morphemes, although in a manner that reflects the complexity of French morphology (see Elin Thordardottir, 2005, 2016a, and for bilingual children, Elin Thordardottir, 2014, 2015). The procedure has, therefore, been well documented in both monolingual and bilingual speakers of French, both with and without LI. In French, however, unlike in English, there has not been a strong tradition of use of such morphological data from spontaneous samples. We discuss the clinical utility of such measures in the next paragraph.

Clinical Uses of LSA

Language sample analysis, particularly in English, owes its widespread and long-standing use in research and clinical settings in large part to its ability to function as a measure of overall language level, and to the strong association that exists between global measures such as MLUm and syntactic and morphosyntactic development (Brown, 1973). Clinically, a child's MLU does a better job than the child's age at predicting which grammatical structures the child has mastered given his or her overall language development (Brown, 1973). This is also a principal reason why MLU is frequently used as a matching variable in research, representing overall language level. The strong association between MLU and morphological development was demonstrated clearly in French for children aged 18 to 47 months, where the productive use of different grammatical morphemes was shown to be far more systematically predicted by MLU level than by age group (Elin Thordardottir, 2005). LSA also allows the documentation of the types of grammatical morphemes used by children. Data from children with TD at various MLU levels provides a crucial roadmap of the typical sequence of acquisition of grammatical morphology, which is an important guide to goal setting in intervention. In addition, it permits an assessment of whether an individual child's length of utterance actually results from the expected advances in morphosyntactic skills. Given that languages vary in their structural characteristics and developmental sequence, it is important to use procedures and reference datasets that adequately reflect the language being assessed.

Another principal advantage of LSA in relation to formal tests is its high ecological validity and the preservation of a true communicative intent. In this respect, LSA provides a different and complementary type of information about a child's language abilities than do standardized tests. Correlational analyses between various French language measures, including standardized tests, measures of verbal memory, and language samples, indeed indicated that MLU contributes unique information on language abilities (Elin Thordardottir et al., 2010). It has been suggested that language sample data are more in line with clinicians' perceptions of language difficulties in children than standardized assessment results (cf. Heilmann, Miller, et al., 2010). This validity issue takes on an even greater importance in languages in which relatively few appropriate language tests are available that are adequately supported by research on these languages. Few standardized language tests are available in Quebec French, and most of the available tests have been translated and adapted from English (such as the EVIP (Dunn, Thériault-Whalen & Dunn, 1993) and the CELF-Canadian (Wiig, Secord, Semel, Boulianne & Labelle, 2009). Even though these particular tests have been renormed on French speaking children, they were not initially constructed to represent the characteristics of the French language or the typical sequence of acquisition of linguistic structures in French. Descriptive data from spontaneous language samples offer a measure that reflects spontaneous production data obtained from native speakers rather than responses to a predetermined set of test items based on another language.

Diagnostic accuracy of LSA measures.

In terms of diagnostic accuracy, research on global LSA measures in English, such as mean length of utterance (MLU) and vocabulary size and diversity, indicate sensitivity only in the fair range (79%) with specificity in the acceptable range (84%) (Heilmann, Miller, et al.,, 2010). A study on Quebec French comparing various measures for the identification of LI at age 5 years (Elin Thordardottir et al., 2011), including the MLUw and MLUm, found that the two MLU measures had similar and very low sensitivity (46%) but better specificity (80%) for the identification of LI. This means that low MLUs, whether computed in words or morphemes, suggested the presence of LI fairly strongly; however, because many children with LI obtained normal-range scores, the presence of LI was often missed. Overall, then, the conclusion for both English and French

is that clinical identification of language impairment is not a main benefit of global LSA measures, although they can contribute to such assessment. That said, LSA measures are superior to most other measures in providing a detailed picture of the child's current language abilities in real life settings. The more authentic portrait of the child's communicative abilities allows the clinician to determine which specific skills should be targeted in intervention, based on which needed skills have not been mastered and on which prerequisite supporting skills are in place.

Language sample length and complexity of analysis

In spite of the availability of various language sample measures for both European and Quebec French (Elin Thordardottir, 2005; 2015; 2016a; Le Normand et al., 2008; Rondal, 2003), systematic LSA is not in widespread use in clinical work with French-speaking children in Quebec. Anecdotal evidence suggests that clinicians may rely on spontaneous utterances glossed over the course of a clinical session to draw conclusions about the mastery of different structures. The clinical interpretation of such a set of utterances is problematic, in part due to selection bias – the clinician will tend to gloss the sentences that he or she finds most interesting or noteworthy. However, the careful collection of a sample of continuous utterances in a specified context and their detailed analysis appear to be rare. A principal reason is likely to be the time-consuming nature of LSA – this reason is reported as a main hindrance to clinical LSA, even in English (Heilmann, Miller, et al., 2010). For a full analysis, a language sample needs to be recorded, transcribed, and coded, a process that can take in excess of an hour. Another reason may be the low diagnostic precision of LSA in identifying LI, and the lack of a strong tradition of other uses of systematic LSA for more in-depth assessments in French.

Previous efforts to make English LSA more feasible within clinical settings have looked at the extent to which language samples can be shortened and still be reliable and informative. There is no general consensus on the necessary or ideal length of language samples; however, normative databases generally use samples of at least 100 utterances, and many research studies have used considerably longer samples. Tilstra and McMaster (2007), looking to develop a brief measure to assess gains in clinical intervention, showed that short narrative samples elicited from a single picture produced reliable results across three such pictures. Across children in K, 1st, and 3rd grade, measures of verbal fluency (such as number of words and C-units per minute) were reliable across the three short samples in all grades. In contrast, measures targeting productivity (absolute number of words or clauses) were reliable only for the oldest children and grammatical accuracy was reliable only for the youngest children. It was suggested that overlap in age between the grade levels might explain the lack of stability of the productivity measures and, further, that brief samples might not give young children sufficient opportunity to show their productive abilities. As for grammatical errors, the fact that they are more common at the younger than older ages was thought to possibly contribute to the higher reliability of grammatical accuracy in K than in 1st and 3rd grade. Similarly, Heilmann, DeBrock, and Riley-Tillman (2013), examined language samples of kindergarteners at risk for LI, collected using a structured set of questions. The results showed high test-retest reliability across topics and sample lengths; sampling context and length had significantly less impact on the language sample measures than did child factors.

In yet another study, Heilmann, Nockerts, and Miller (2010) demonstrated that global measures of lexical diversity (words per minute and number of different words per minute), number of utterances, and utterance length were highly consistent across samples of 1, 3, and 7 minutes obtained from two age groups of children, 2;8 to 5;11 and 6;0 to 13;3, in both conversational and narrative contexts. These authors chose to focus on global measures rather than more fine-grained analyses such as grammatical morphology because they considered the latter to be less appropriate for short language samples in that they target some low-frequency elements of language. It is important to note that in this study, LSA measures included ones based on ratios (e.g. words per minute) as well as absolute counts (e.g. number of different words). However, the absolute count measures were, at least in some of the analyses, converted into ratios (such as number of different words per minute). An important body of literature has demonstrated that lexical diversity counts are sensitive to the number of words in the sample being considered (Duran, Malvern, Richards, & Chipere, 2004; Richards & Malvern, 1997). As a result, counts such as Total Number of Different Words (TDW) are likely to be higher in longer samples and also in samples with a higher MLU (more words per utterance). One way around this issue has been the use of Type Token Ratio (TTR: total number of different words/total number of words; however, this metric has also been shown to be biased, and other less biased metrics have been proposed (Duran et al., 2004). These results indicate that absolute counts should not be expected to stay constant across sample lengths.

Together, these studies are encouraging in that they indicate that the collection of lengthy samples is not necessary for all LSA purposes; however, they are limited in that they have focused solely on English and in that there has been little focus on grammatical morphology across sample lengths, with one study finding morphological errors not to be reliable across lengths, and another study assuming that morphology would not be a good candidate measure for shorter samples. The effect of sample length on various LSA measures may vary across languages. Notably, the development of grammatical morphology varies greatly across languages. Consequently, morphological findings may contribute in different ways to clinical conclusions across languages. In languages that are moderately or very highly inflected, including Icelandic, Dutch, and Irish, a very high correlation has been found between MLUm and MLUw in samples of TD children (Arlman-Rupp, et al., 1976; Elin Thordardottir & Ellis Weismer, 1998; Hickey, 1991). Furthermore, a near-perfect correlation was found in samples of Icelandic-speaking children aged 4 to 14 years old with and without Specific Language Impairment (SLI) (Elin Thordardottir, 2016b). This suggests that a detailed coding of grammatical morphology may be overkill in some languages if the main purpose is to derive a global measure of utterance length. However, information on grammatical morphology is, in its own right, a major clinical benefit of LSA, in particular for the assessment of language level, selection of intervention goals, and monitoring of treatment gains. Short samples are likely to give a good representation of a core set of high frequency words and structures, whereas low frequency words and structures, including some grammatical morphemes, are less likely to be seen in shorter samples. This may reduce the clinical advantages of short samples. However, given that the frequency of grammatical morphemes varies across languages, negative effects of short samples on morphology may be felt less in relatively more highly inflected languages. Given that languages also vary in which structures are most vulnerable in LI, and at which points in time (Elin Thordardottir, 2016b), languages may vary in whether a high correlation between MLUm and MLUw is found in samples of children with LI. Clearly, more research is needed to better understand the effect of sample length across languages and across language domains.

Purpose of Study

The main purpose of this study was to examine the effect of sample length on French LSA measures, specifically global utterance length, lexical counts, number of mazes, and detailed morphological production. The interest is on one hand theoretical and on the other hand has the goal of developing a simplified yet informative clinical procedure. To date, little is known about the effects of sample length on clinical LSA measures in languages other than English. However, there are reasons to believe that the effects might not be uniform across measures across languages. Novel aspects of this study include not only the focus on French, but also a focus on the effect of sample length on grammatical morphology counts, both in children with TD and with LI. Language samples from several previous studies were pooled together for the analyses performed in this study. Therefore, an additional outcome of the study is the presentation of a French LSA database for a relatively large group of children with TD, and a smaller group of children with LI. Whereas parts of these data have been published previously for subgroups of the children in the study, this study presents, for the first time, data on vocabulary diversity and on mazes. Further, previous publications of the data have not examined effects of sample length.

Specific research questions are the following: 1) Are the various LSA measures in French sensitive to development in children with TD and children with LI? 2) How do children with TD and LI compare on the various LSA measures in French? 3) How stable are global language sample measures (utterance length, lexical, and maze counts) across sample length? 4) How stable are more fine-grained measures of morphological diversity across sample length? 5) What is the shortest sample length that can provide reliable and clinically useful information?

Methods

Participants

Participants included a total of 149 monolingual French-speaking children: 124 children with typical development (TD, age range 21 to 71 months) and 25 children with primary (specific) language impairment (LI, age range 37 to 77 months). These children were participants in previous studies conducted in the same research lab using the same language sampling and analysis procedures and collection of background information (Elin Thordardottir, 2005; Elin Thordardottir, 2015; Elin Thordardottir et al., 2010; Elin Thordardottir et al., 2011; Elin Thordardottir & Namazi, 2007; Elin Thordardottir, Rothenberg, Rivard, & Naves, 2006). Of a total of 163 language samples gathered from these studies, 14 were excluded because they did not contain a full set of 100 utterances, leaving 149 samples. Diagnostic status as TD or LI was determined within each of the previous studies. Children with TD had no history of delayed development, major illnesses or hospitalizations, or pre- or perinatal complications as per parent report. They were

given a number of language measures, which are reported within each of the respective studies. Children with LI were recruited through clinical referral; their diagnostic status was verified as part of the studies in which they participated (Elin Thordardottir et al., 2011; Elin Thordardottir & Namazi, 2007). As the data from these various studies were pooled, age groups were formed: 2 year olds (24 months ± 6 months, or 20 to 29 months inclusive), 3-year- olds (36 months ± 6 months, or 30 to 41 months), 4-year-olds (48 months ± 6 months, or 42 to 53 months), 5-year-olds (60 months ± 6 months, or 54 to 65 months), 6-year-olds (72 months ±6 months, or 66 to 77 months). Background characteristics as well as the distribution of children into these groups is displayed in Table 1. Background characteristics included gender, maternal education as a proxy for socio-economic status (SES), and nonverbal cognition (brief IQ scale of the Leiter International Performance Scale-Revised, Roid & Miller, 1997). The Leiter was not administered in one of the studies targeting young children with TD.

Procedures

Language samples were collected as part of a larger assessment protocol that varied across studies. The language sampling and analysis method was the same across all studies: samples were collected in a conversational play context, using a standard set of toys (for the younger children a house with people and furniture, household and food items; for the older children Playmobil and Polly Pocket toys). The children interacted with a trained examiner who was a native speaker of Quebec French. The examiner was instructed not to put pressure on the child, to give the child time to speak, and to refrain from asking many questions, particularly ones that would elicit a yes/no response. The examiner was instructed to show interest in the child's utterances and to respond to them. If children did not spontaneously engage in talk, the examiner was instructed to engage in self-talk and parallel talk in order to engage the child in conversation by modelling conversational behaviors.

Table 1. Background Characteristics for TD and LI Groups by Age Group.

TD Group:

	Age in months	n	girls	boys	Mat.Ed.	Leiter Brief IQ
2 years	24.14 (2.03)	7	4	3	15.0 (4.8)	not available
3 years	35.33 (3.17)	*28*	*11*	*17*	*15.6 (2.6)*	*109.8 (17.2)*
4 years	48.00 (3.78)	19	12	7	16.6 (3.0)	112.3 (17.2)
5 years	59.10 (3.74)	58	26	32	16.4 (2.9)	99.9 (19.2)
6 years	68.17 (1.85)	12	5	7	17.4 (2.5)	104.6 (20.2)

LI Group:

	Age in months	n	girls	boys	Mat.Ed.	Leiter Brief IQ
2 years	no participants					
3 years	38.33 (1.53)	3	1	2	19.0 (1.4)	100.0 (18.4)
4 years	47.00 (3.80)	10	1	9	14.8 (2.5)	102.9 (17.7)
5 years	56.80 (3.27)	5	1	4	14.5 (2.6)	111.3 (10.9)
6 years	68.57 (4.11)	7	7	0	13.7 (4.2)	94.9 (22.5)

Language samples were transcribed orthographically using SALT software (Systematic Analysis of Language; Miller et al., 2011). Grammatical morphology was coded following the French adaptation of SALT conventions. For a full description, see Elin Thordardottir (2005) or the online SALT manual (Miller et al., 2011). Transcription and coding reliability was verified and reported within each of the studies in which the samples were originally collected. For each child, a 100-utterance sample was obtained, excluding utterances that were exact repetitions of a previous utterance, but including utterances that contained unintelligible words. This procedure was used because unintelligible segments frequently make up a very small proportion of an otherwise grammatical and intelligible utterance. Given trade-off effects in language use, there is also a danger that unintelligible segments may tend to occur with higher frequency in longer and more complex utterances: excluding them might, therefore, bias the sample.

In order to examine effects of sample length, shorter sample cuts of 50, 25, and 12 utterances were obtained. The shorter samples were each taken from the middle of the original 100-utterance sample. Each shorter sample is, therefore, a subsample of the longer samples. Measures derived from each sample, using SALT, included mean length of utterance in words (MLUw), mean Length of utterance in morphemes (MLUm), total number of words (TW), total number of different words (TDW), and morphological diversity (MD). Morphological diversity refers to the number of different types of grammatical morphemes found in the sample. The set of grammatical morphemes documented in all the samples included these 16: verb person marking, compound past tense (*passé composé*), imperfect past tense (*imparfait*), pluperfect past tense (*plus-que-parfait*), periphrastic future tense (*futur proche*), simple future tense (*futur simple*), simple past tense (*passé simple*), imperative verb mood, subjunctive verb mood, conditional verb mood, past participle when not part of a compound tense, gender marking of adjectives, gender marking of pronouns, plural marking of adjectives, plural marking of pronouns, and plural marking of nouns. Other verb tenses exist in French that did not occur in the samples in this age range, but which would have been coded had they occurred. Therefore, the 16 morphemes represent the maximal morphological complexity found in this age range in a 100-utterance sample.

Results

100-Utterance Samples

The first research question asked whether the different LSA measures are developmentally sensitive for children with TD and children with LI. We first report results for the 100-utterance samples – a sample length frequently used in normative reference databases, including our previous reports on French language samples from both monolingual and bilingual speakers of Quebec French (Elin Thordardottir, 2005; 2015; 2016a). Data are reported in Table 2, displaying MLUw, MLUm, TW, TDW, MD, and number of mazes, for age groups of 2-, 3-, 4-, 5-, and 6-year-old children with TD. The table also gives results for 3-, 4-, and 5-year-old children with LI. The results for the children with LI need to be interpreted with caution because of the small size of some of the age groups and also because of potential differences in severity levels that likely contribute to variability within each group. These data should not be seen as a reflection of the expected performance of children of the corresponding ages who have LI, as children with LI are a more heterogeneous group than children with TD. However, these data do offer descriptive information about these children's developmental trajectory, including the relationship between MD and MLU, as well as the sequence of acquisition of grammatical morphemes. For both the TD and LI groups, the 100-utterance measures of utterance length, vocabulary diversity, and morphological diversity increased systematically with age. For the TD group, MLUw increased from 2.17 to 4.83, and MLUm from 2.63 to 6.61 between ages 2 and 6 years. For the LI group, MLUw increased from 2.21 to 3.40 and MLUm from 2.66 to 4.30 between ages 3 and 6 years. Significant positive correlations were found between each measure and age for the TD group, with the exception of number of mazes: MLUw: r= .506, p< .01; MLUm: r= .498, p< .05; TW: r= .506, p< .01; TDW; r= .599, p< .01; MD: r= .550, p< .01; number of mazes: r= .099, p= .639. For the children with LI, all the measures were significantly correlated with age at p< .01: MLUw: r= .594; MLUm: r= .630; TW: r= .630; TDW, r= .692; MD: r= .499, and number of mazes: r= .348.

ANOVA analyses were performed for the TD group to examine age group effects, revealing a significant effect of age group for each measure (MLUw: F (2, 123)=17.566, p< .001, η^2= .37; MLUm: F (4.123)=19.733, p< .001, η^2= .40; TW: F (4,123)= 28.448, p< .001, η^2= .49; TDW: F (4,122)= 20.131, p< .001, η^2= .41; MD: F (4,122)= 11.521, p< .001, η^2= .28; number of mazes: F (4,122)= 4.620, p< .001, η^2= .28). Post Hoc Tukey tests (family-wise alpha set at p< .05) revealed a similar pattern for MLUw and MLUm, TW, TDW, and MD: 2-year-olds and 3-year-olds did not differ significantly from each other, but each differed from the 4, 5, and 6-year-olds. The 5- and 6-year-olds did not differ significantly from each other, but differed from the 2-year-olds and 3-year-olds for all five measures. For MLUm, TW, and TDW, 4-year-olds differed

Table 2. Means and (Standard Deviations) of Language Sample Measures in 100-Utterance and 25-Utterance Samples for Children with TD and LI

Age	MLUw 100	MLUw 25	MLUm 100	MLUm 25	TW 100	TW 25	TDW 100	TDW 25	MD 100	MD 25	#Mazes 100	#Mazes 25
Children with TD:												
2y	2.17	2.57	2.63	3.22	217.3	64.3	48.9	25.9	7.9	4.0	8.1	1.0
	(0.91)	(1.07)	(1.06)	(1.58)	(90.4)	(28.9)	(15.5)	(13.5)	(3.2)	(2.6)	(5.0)	(0.8)
3y	3.03	3.03	3.72	3.75	303.3	75.0	81.9	35.7	10.4	6.0	20.6	4.2
	(0.78)	(1.04)	(1.10)	(1.40)	(79.4)	(26.0)	(26.1)	(11.2)	(3.2)	(2.4)	(21.0)	(6.3)
4y	3.89	3.72	5.03	4.62	390.1	91.7	116.4	45.4	12.4	7.1	25.3	5.1
	(0.81)	(1.03)	(1.14)	(1.33)	(80.4)	(24.3)	(21.0)	(8.4)	(2.5)	(2.3)	(21.5)	(7.5)
5y	4.56	4.52	5.83	5.80	453.8	113.1	127.0	53.6	13.6	8.4	38.3	8.7
	(0.97)	(1.23)	(1.36)	(1.72)	(97.3)	(30.8)	(26.9)	(11.9)	(2.6)	(2.7)	(26.7)	(8.5)
6y	4.83	4.98	6.61	6.37	508.5	124.5	142.7	59.8	13.3	8.2	38.5	11.1
	(1.98)	(1.88)	(2.43)	(2.60)	(164.7)	(46.9)	(32.5)	(16.5)	(1.8)	(3.0)	(30.0)	(10.7)
Children with LI:												
3y	2.21	2.20	2.66	2.93	221.3		56.7	25.0	7.3	4.7	14.3	5.0
	(0.85)	(1.0)	(1.05)	(1.31)	(85.0)		(37.6)	(19.9)	(3.2)	(1.2)	17.0)	(4.5)
4y	2.22	2.26	2.68	2.81	221.8		56.4	24.0	7.6	4.0	6.2	1.5
	(0.70)	(0.74)	(0.97)	(0.95)	(69.4)		(20.6)	(10.1)	(2.7)	(3.2)	(5.7)	(1.8)
5y	3.14	3.29	3.95	4.02	314.0		90.4	38.4	11.6	6.4	22.6	5.8
	(0.45)	(0.92)	(0.62)	(1.24)	(44.9)		(15.5)	(11.2)	(1.5)	(3.1)	(9.5)	(4.0)
6y	3.39	3.03	4.30	4.18	339.7		97.7	39.0	11.9	6.4	10.1	1.29
	(1.37)	(1.18)	(1.97)	(1.83)	(137.0)		(29.1)	(15.4)	(4.1)	(1.9)	(11.1)	(2.6)

significantly from 6-year-olds; whereas for MLUw and MD, no difference was found between 4-, 5-, and 6-year-olds. For MD, 4-year-olds differed significantly from 2-year-olds. A different pattern emerged for the number of mazes: the only significant difference between age groups was that the groups of 2- and 3-year-olds each differed significantly from the group of 5-year-olds. ANOVA analysis on age effects in the LI group was not performed because of the small size of the age groups. Visual inspection of the LI data suggests a clear distinction between the two younger groups on one hand, and on the other hand, the two older groups.

Comparison of children with TD and LI

The second research question was how children with TD and LI compare on the various LSA measures. Comparison of the means of the TD and LI groups suggests that the children with LI are roughly 1 to 2 years behind their TD peers in their language sample measures. For a statistical comparison of the two groups, matched subgroups were formed: each of the 25 children with LI were matched with a child from the TD group on age (within 2 or 3 months) and on gender. Exceptions to this matching were that the oldest child in the LI group (77m) could not be matched closer than within 6 months as the oldest child in the TD group was 71 months old. Further, for two children, a gender match and age match could not be obtained. Thus one girl in the LI group was matched with a boy of the same age from the TD group, and one boy was matched with a girl. The resulting groups thus included the 25 children with LI (mean age 53.96 m (*SD* 11.24) and 25 children with TD (mean age 54.0 months (*SD* 10.62). T-tests were used to compare the two groups. The two groups did not differ significantly in age (p= .990), but differed significantly on all the other measures. Children with TD had a significantly higher MLUw, and MLUm, greater number of words and different words as well as greater diversity of grammatical morphemes than did children with LI. Children with TD also produced a significantly greater number of mazes than children with LI. Detailed results are reported in Table 3.

Global measures (MLU, lexical and maze counts) across sample lengths

The third research question concerned the stability of the global LSA measures across sample length. Results on MLUm and TDW at sample lengths of 100, 50, 25, and 12 utterances are graphed in Figures 1 and 2, respectively, for the TD and LI group. These graphs provide a visual illustration of the patterns observed: those measures that are averages (MLUm and MLUw) changed little across sample lengths, whereas those that are based on absolute numbers of items, namely TW and TDW, increased systematically with increasing sample length.

Group means and standard deviations for each LSA measure are reported in Table 2, for sample lengths of 100 and 25 utterances. In comparing MLUw at 100 and 25 utterances lengths, the average difference was 0.49 (*SD* 0.42, range 0 to 1.93). MLUw changed by 0.5 or less for 61% of the children (91/149), by 0.5 to 1.0 for 27% of the

Table 3. Comparison of Matched Subgroups of Children with LI and TD for Language Sample Measures at a Length of 100 Utterances: Means,(Standard Deviations), T-test Results, and Effect Sizes

	LI	TD	*t* (48)	*p*	Cohen's *d*
MLUw	2.73 (1.05)	4.26 (1.64)	-1.52480	.001	-1.11
MLUm	3.38 (1.44)	5.66 (2.16)	-2.28200	.001	-1.24
TW	273.2 (102.5)	437.5 (151.4)	-164.320	.001	-1.27
TDW	74.8 (30.4)	123.6 (33.6)	-48.800	.001	-1.52
MD	9.6 (3.6)	12.8 (2.7)	-3.28000	.001	-1.01
Mazes	11.6 (11.0)	32.5 (26.5)	-20.800	.001	-1.03

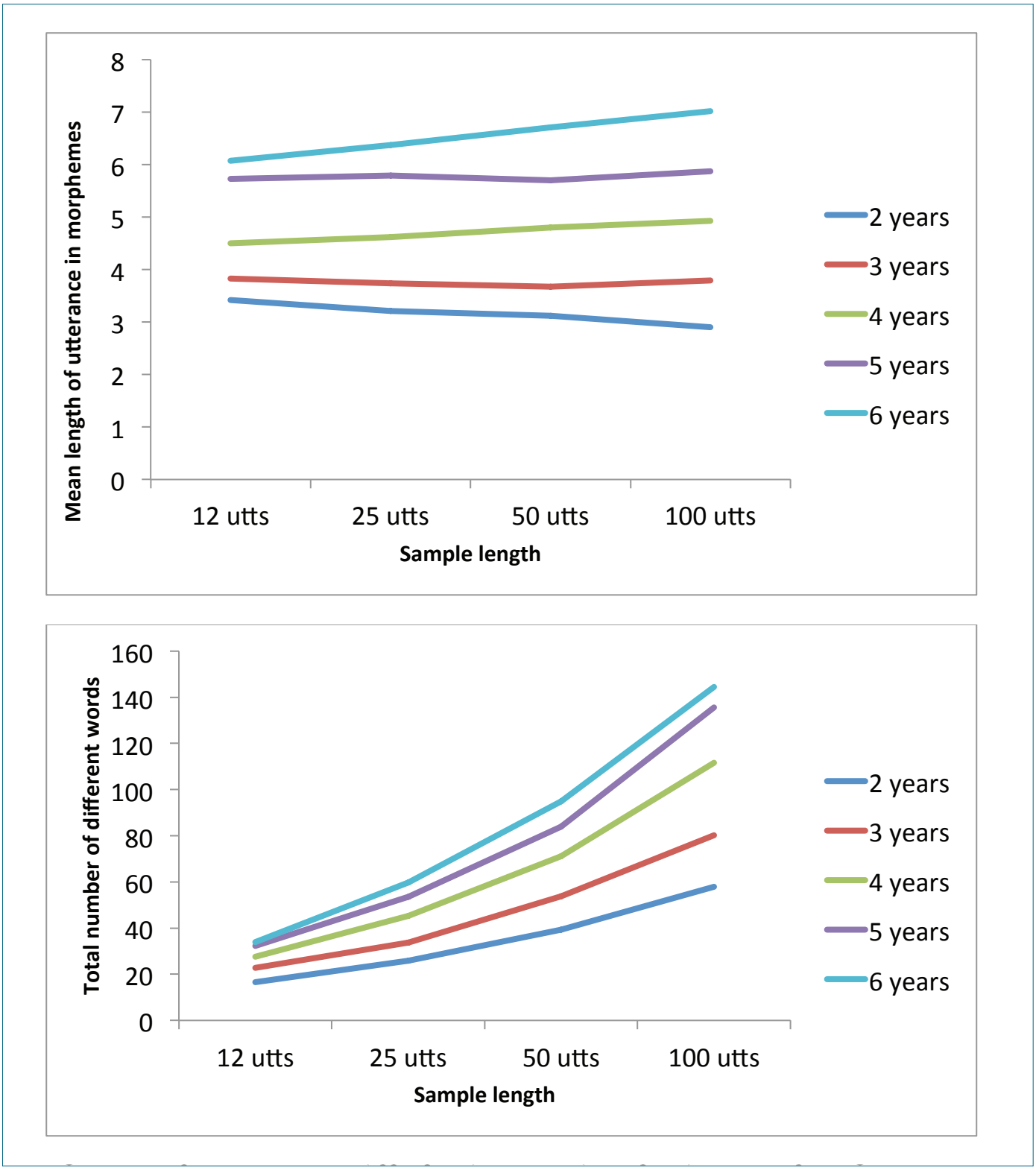

Figure 1. Group means for MLUm (upper panel) and TDW (lower panel) across sample lengths of 12, 25, 50, and 100 utterances, for age groups of children with TD.

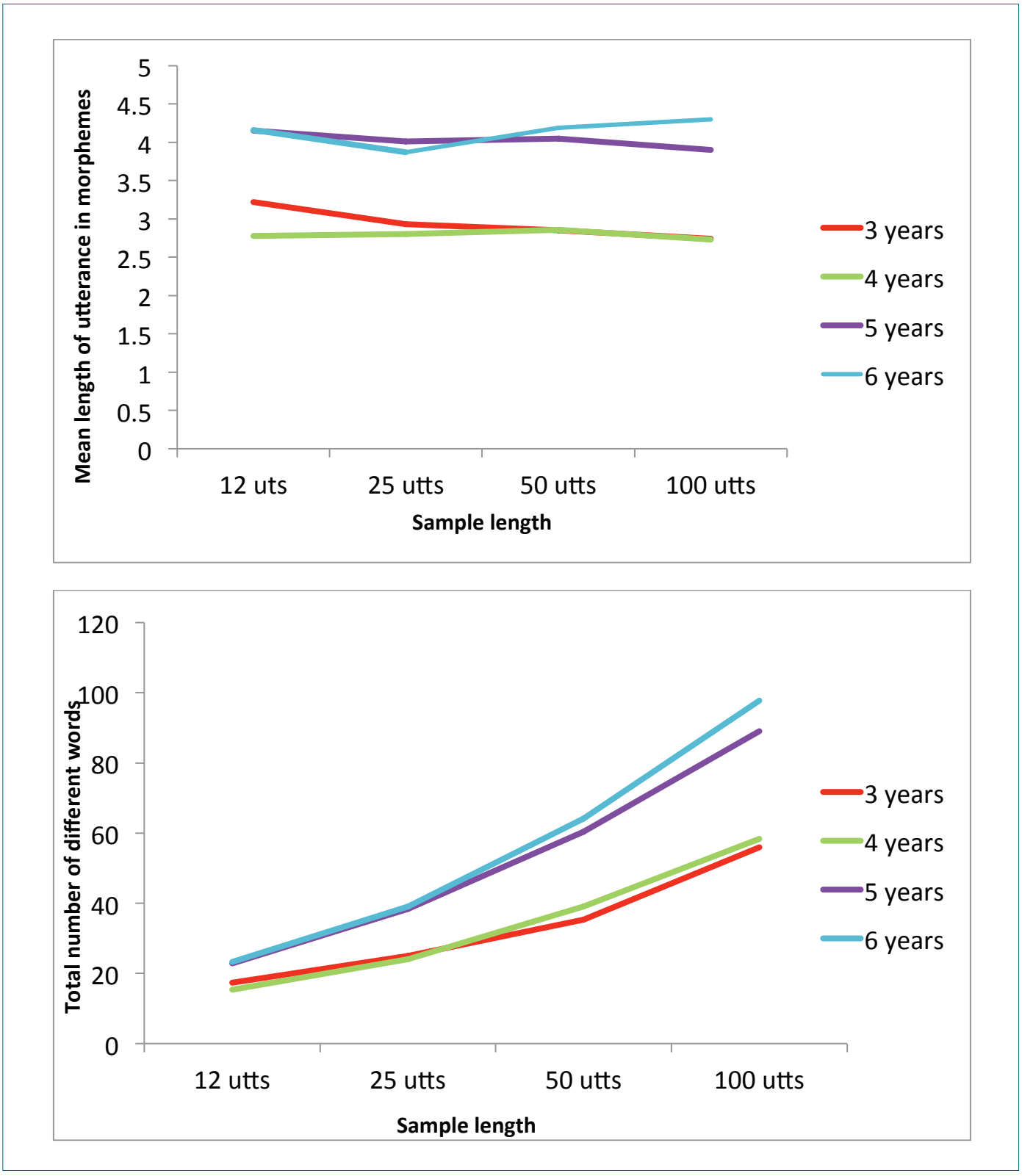

Figure 2. Group means for MLUm (upper panel) and TDW (lower panel) across sample lengths of 12, 25, 50, and 100 utterances, for age groups of children with LI.

children(40/149), and by more than 1.0 for only 12% (18/149) of the children. Table 4 displays results of correlational analysis where results for each measure at each of the shorter sample lengths (50, 25, and 12 utterances) are correlated with the same measure in a 100-utterance sample. The strength of the correlations decreases somewhat with decreasing sample length; however, all the correlations were significant at the $p < .001$ level, and were generally very strong (generally above $r = .800$). Correlations between sample lengths were somewhat stronger for the LI group than the TD group. The weakest correlations were found between samples of 100 and 12 utterances, in particular for the TD group, and for lexical diversity (TDW), also in particular for the TD group. The number of mazes in a sample is another global LSA measure. Table 2 shows that the number of mazes is greater in longer samples and increases with increasing age. The number of mazes in samples of 100 and 25 utterances was highly correlated for children with TD, but not for children with LI (see Table 4).

Morphological diversity across sample lengths

The fourth research question concerned the stability of morphological production across sample lengths. Morphological diversity (MD) involves a more fine-grained analysis than the global measures reported on in the previous section. MD was examined in samples of 100 and 25 utterances, given that samples as short as 25 utterances retained a high correlation with 100-utterance samples for the global measures. MD is reported for these two sample lengths in Table 2. For each age group, fewer morpheme types are seen in shorter samples. However, a significant and strong correlation was found between MD100 (MD computed from a 100-utterance sample) and MD25 (MD computed from a 25-utterance sample) for children with TD ($r = .707$, $p < .01$) and for the LI group ($r = .580$, $p < .01$) (see Table 4). To verify the association between MLU and MD, correlational analysis revealed, for the TD group, that MD100 was significantly correlated with MLUw100 ($r = .665$), MLUm100 ($r = .627$), as well as TW100 ($r = .645$) and TDW100 ($r = .698$), all significant at the $p = .001$ level. For the LI group, MD100 similarly correlated with all global measures: MLUw100 ($r = .884$), MLUm100 ($r = .888$), TW100 ($r = .932$),TDW100 ($r = .932$), all significant at the $p = .001$ level. Given that MD correlated with both MLUm and MLUw, the latter was using for MLU grouping because it is less time consuming to compute.

MLU groups

For a further qualitative analysis, children were divided into groups based on MLUw100 (1.0-2.99, 3.0-4.99, and 5.0-6.99). This procedure follows the tradition of using MLU level to predict morphological level, including in French (Elin Thordardottir, 2005; 2015). The use of one sample length for the MLU grouping ensured that the data for

Table 4. Correlations between LSA Measures Obtained from Samples of 50, 25, and 12 Utterances with the Same Measure Obtained from a 100-Utterance Sample

	50 utterances		25 utterances		12 utterances	
	TD	LI	TD	LI	TD	LI
MLUw	.962**	.977**	.886**	.900**	.777**	.802**
MLUm	.976**	.976**	.889**	.915**	.771**	.829**
TW	.890**	.899**	.823**	.773**	.710**	.733**
TDW	.706**	.957**	.660**	.898**	.555**	.857**
MD			.707**	.580**		
#Mazes			.836**	.370 (NS)		

**$p < .001$

morphological use at 100 utterances and 25 utterances involved exactly the same children. It is worth noting that most, but not all, of the children would have been assigned to the same MLUw group had the grouping been based on 25 utterances (see previous section on global measures across sample lengths). To compare the types of morphemes that children are likely to use in the span of 100 versus 25 utterances, Table 5 shows the percentage of TD children in each MLUw group that were found to use each grammatical morpheme at the two sample lengths. As the table reveals, the different morphemes varied widely in the proportion of children that use them. Morphemes with high use at 100 utterances in all MLUw groups included the gender of adjectives and pronouns, the imperative mood, and person marking. It should be noted that because adjectives and pronouns have no basic gender, gender marking was always coded, whether the gender distinction is audible or not. Morphemes with medium levels of production, even by the lowest MLUw group, included noun plurals, the compound past (*passé composé*), and periphrastic future (*futur proche*) tenses. In general, the percentage of children using each morpheme increased with increasing MLUw group. A particularly noticeable increase with increasing MLUw is seen for the imperfect (*imparfait*) past tense, the simple future, the pluperfect, and the subjunctive and conditional moods. Compared to morphological use in a 100-utterance sample, a lower percentage of children are shown to use each of the morphemes in a 25-utterance sample. However, some morphemes are used by a high percentage of the children even at this short sample length. What is particularly noteworthy is that the relative standing of morphemes as being likely or unlikely to be seen is preserved in the 25-utterance samples compared to the 100-utterance samples.

Probability of use of morphemes by MLU group.

Table 6 shows the percentage of children with LI in each MLUw group using each of the morphemes. Due to the smaller number of children with LI and smaller MLU range, only two MLUw groups could be formed. Morphemes used by a relatively large proportion of children with LI include gender marking of adjectives and pronouns, noun plurals, the imperative mood, and person marking. Morphemes with medium levels of use include the compound past tense (*passé composé*), and periphrastic future tense (*futur proche*). This pattern is parallel to that of the TD children. However, several morphemes were never observed in samples of children with LI: the subjunctive and conditional moods, the simple future (*futur simple*), simple past tense (*passé simple*), and pluperfect (*plus-que-parfait*). Around 20% of children with TD were observed to use these tenses in the MLUw group corresponding to the highest MLU group of the LI children (MLUw 3.00-4.99). As for the TD children, fewer children with LI are observed to use each morpheme in 25- than in 100-utterance samples. However, the pattern of morphemes that are more or less likely to be seen is similar at both sample lengths. Together, Tables 5 and 6 suggest that MD increases with increasing MLUw in both TD and LI groups and that both groups follow a similar sequence of acquisition of these morphemes. The children with LI may need a somewhat higher MLUw to produce at least some of the morphemes.

A clinical short-cut

The final research question asked what the shortest sample length is that can yield clinically reliable and useful information. The results presented thus far have indicated that a 25-utterance sample represents a reasonable compromise for the global measures. Because of the predictable relationship between the more fine-grained MD measures in the 100- and 25-utterance samples, we propose a clinical shortcut that allows complex morphological information based on reference data on 100-utterance samples to be estimated from global analysis of a much shorter clinical sample (see Figure 3 for a summary of the steps).

Rationale for the shortcut procedure.

The ability to predict expected MD from MLU levels is a major clinical benefit of LSA. It is clear that the 100-utterance sample gives a more complete picture of morphological development than the 25-utterance sample. Indeed, the longer samples give more opportunity for use of a variety of morphemes. On average, children in the TD group were found to use 4.92 (*SD* 2.31) fewer morpheme types in the 25- than in the 100-utterance sample. The result was comparable for children in the LI group, who used on average 4.32 (*SD* 3.0) fewer morpheme types in the shorter sample. However, even though absolute numbers of different morphemes differed between the sample lengths, MD100 and MD25 were significantly and strongly correlated, both for children with TD and with LI (see Table 4). Therefore, even though MD is not stable across sample lengths in the sense that the same number of different morphemes is produced, it is stable in the sense that the two sample lengths differ in predictable ways, as detailed above. Given that the information obtained from a 100-utterance sample is more complete and thus more useful, but is time consuming to obtain for individual children, it would be beneficial clinically to be able to predict

Table 5. Percentage of Children with TD in each MLUw100 Group who use Different Types of Grammatical Morphemes in Samples of 100 Utterances and in Samples of 25 Utterances

	MLUw 1.00-2.99		MLUw 3.00-4.99		MLUw 5.00-6.99	
Sample length	**100**	***25***	**100**	***25***	**100**	***25***
Gender of Adj.	88.8	*65.2*	100	*87.1*	100	*88.5*
Gender of Pron.	69.2	*7.7*	91.4	*52.9*	95.8	*76.9*
Plural of Adj.	23.1	*7.7*	67.1	*25.7*	92.3	*53.8*
Plural of Pron.	0	*0*	50.0	*15.7*	61.5	*34.6*
Plural of Noun	50.0	*42.3*	98.6	*72.9*	100	*92.3*
Imperative mood	84.6	*46.2*	85.7	*35.7*	92.3	*34.6*
Subjunctive mood	11.5	*0*	22.9	*4.3*	57.7	*15.4*
Conditional mood	0	*0*	18.6	*7.1*	38.5	*11.5*
Past participle alone	23.1	*0*	10.0	*2.9*	3.8	*0*
Verb Person	100	*100*	100	*100*	100	*100*
Passé composé	57.7	*23.1*	90.0	*48.6*	100	*57.7*
Imparfait	11.5	*0*	70.0	*34.3*	84.6	*46.2*
Futur simple	3.8	*0*	17.1	*4.3*	30.8	*23.1*
Passé simple	3.8	*0*	1.4	*0*	4.2	*0*
Plus-que-parfait	0	*0*	20.0	*1.4*	42.3	*19.2*
Futur proche	46.2	*30.8*	95.7	*52.9*	96.1	*69.2*

Table 6. Percentage of Children with LI in each MLUw100 Group who use Different Types of Grammatical Morphemes in Samples of 100 Utterances and in Samples of 25 Utterances

	MLUw 1.0-2.99		MLUw 3.0-4.99	
Sample length	**100**	***25***	**100**	***25***
Gender of Adj.	100	*100*	100	*87.1*
Gender of Pron.	75.0	*0*	62.5	*50.0*
Plural of Adj.	12.5	*6.3*	18.8	*12.5*
Plural of Pron.	6.3	*0*	50.0	*12.5*
Plural of Noun	62.5	*37.5*	87.5	*37.5*
Imperative mood	87.5	*56.3*	100	*87.5*
Subjunctive mood	0	*0*	0	*0*
Conditional mood	0	*0*	0	*0*
Past participle alone	12.5	*6.25*	0	*0*
Verb Person	93.8	*93.8*	100	*100*
Passé composé	50.0	*12.5*	100	*25.0*
Imparfait	6.3	*6.3*	87.5	*50.0*
Futur simple	0	*0*	0	*0*
Passé simple	0	*0*	0	*0*
Plus-que-parfait	0	*0*	0	*0*
Futur proche	43.8	*6.3*	87.5	*50.0*

MD100 from a simpler LSA measure. It is interesting in this respect that MD100 was shown to be highly correlated with all the global LSA measures, both MLU counts, lexical diversity, and mazes (see previous section). Thus, any of the global measures would be a contender. One aspect that may make MLU more suitable is that, because it is an average, its absolute value changes very little across sample lengths, unlike TW and TDW. Given the near-perfect correlation between MLUm and MLUw, the latter of these two appears to be a better choice because it is much simpler to derive. Finally, because of the strong correlation between all the LSA measures across sample lengths (Table 4), it may be justifiable to use MLUw25 rather than MLUw100 to predict not only MD25, but also MD100, using the descriptive data presented in Table 6. Further correlational analysis undertaken to evaluate the adequacy of this strategy revealed that MD100 is correlated approximately equally strongly to MLUm100 (r=.651), MLUm25 (r=.640), and MLUw25 (r=.615), all significant at the p= .001 level. This suggests that it is indeed justifiable, as a shortcut, to use MLUw25 to predict with reasonable confidence the morphological diversity that would likely have been seen had a 100-utterance sample been collected and analyzed.

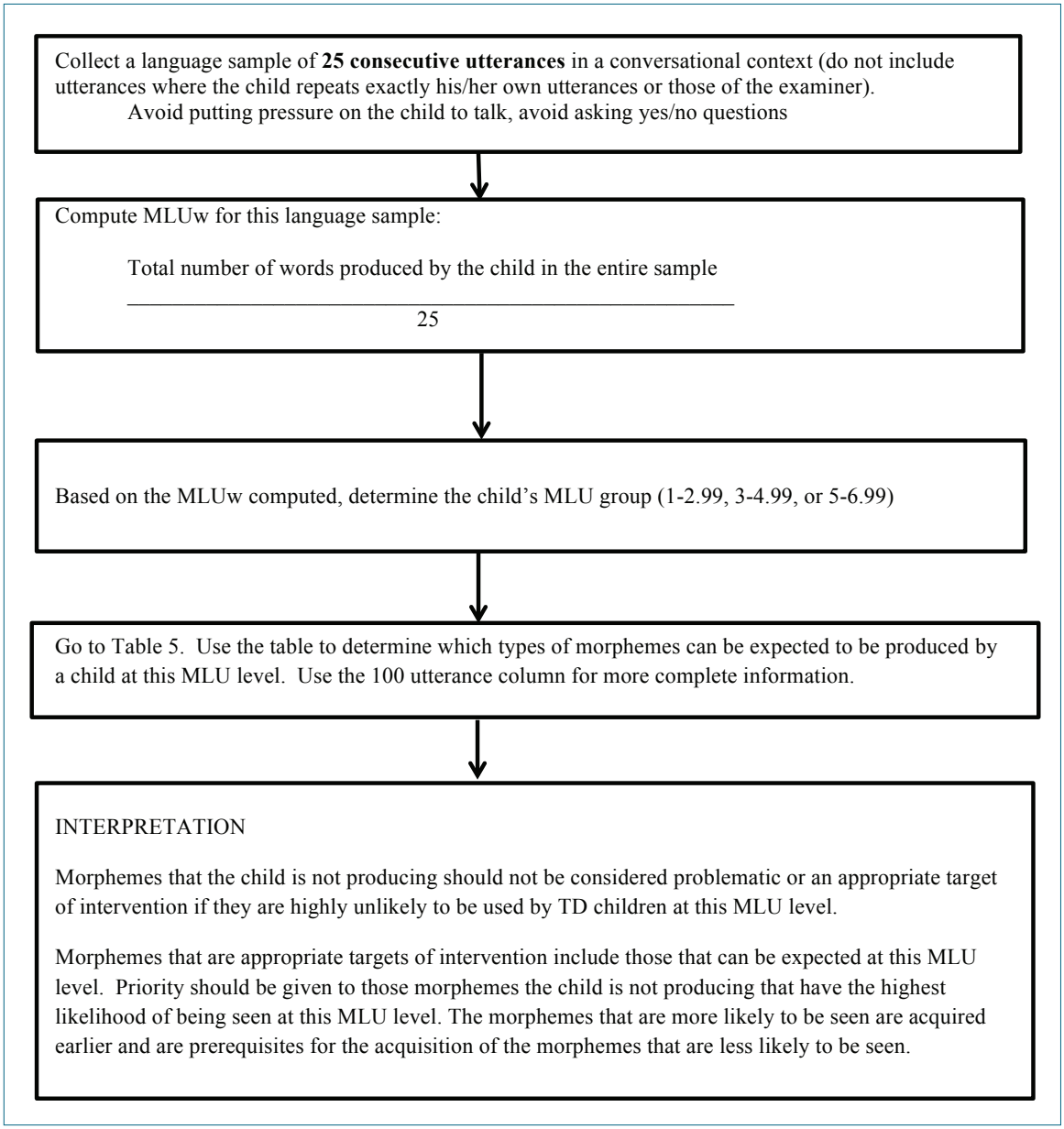

Figure 3. Clinical short cut procedure for the estimation of a child's morphological diversity.

Tables 5 and 6 provide information on the grammatical morphemes that are likely or unlikely to be found in 100- and 25-utterance samples of specific MLU levels. In order to use these tables, the child's MLU group needs to be established. A crucial issue concerning implementation of the shortcut procedure is whether children stay in the same MLU group whether their group is formed based on 100 or 25 utterances. For the TD children, 99 (79.8%) stayed in the same MLU group whether the group assignment was based on 100 or 25 utterances, whereas 16 (12.9%) went up one group, and 9 (7.2%) went down one group. For the children with LI, 19/25 (76%) stayed in the same group, whereas 2 (8%) moved up one group, and 4 (16%) moved down one group when the assignment was based on 25 utterances rather than 100. This provides further indication that for the large majority of children, estimation of MD100 from MLUw25 is a reasonably safe bet. To give an example of how MD data like the ones reported in Tables 5 and 6 could be used clinically, Table 5 indicates that only 25.7% of children with TD with an MLUw in the 3.0-4.99 range use the passé composé (compound past tense) in a 25-utterance sample, whereas 90% of children with this MLUw range will use it in a 100-utterance sample. This indicates that children in this MLUw range are highly likely to have the passé composé (compound past tense) in their repertoire even if they do not use it in a short sample. For added certainty of interpretation, the clinician could verify whether the morphemes most likely to appear in the short sample are produced (gender marking of adjective, plural of noun, verb person), which would provide more evidence that morphological use is as expected for MLUw level even in a short sample. This being the case, the data for 100 utterances can then be seen as a better indication of what the child is actually capable of producing.

Discussion

This study examined French LSA measures at four language sample lengths, including the global measures of utterance length, vocabulary diversity, and mazes and the more fine-grained measures of morphological diversity. All the global measures demonstrated remarkable stability of LSA in successively shorter samples, with very high correlations obtained between measures collected at each shorter length compared to the longest sample. Changes in MLU were negligible for the great majority of the children between samples of 100 and 25 utterances, with the great majority of the children being assigned to the same MLU group regardless of which sample length was used. Moreover, differences between age groups were similar at each sample length. Of great importance also, high correlations between samples of different lengths were found both for children with TD and with LI. Even though samples as short as 12 utterances correlated quite highly with a 100-utterance sample, there was a greater drop in correlation strength between 25 and 12 utterances than between 50 and 25. A 25-utterance sample, therefore, appears to be a reasonable compromise between time investment and information value. It is worth noting here that in this study, shorter samples were a subsample of the longer samples, as the goal was to assess how much a sample can be shortened. This differs from the goal of some previous studies, for example, that of Tilstra and McMasters (2007), which compared short samples collected using three different elicitation pictures. That study addressed the test-retest reliability of short samples, whereas the present study addressed the extent to which a sample collected in a given setting provides more reliable information if it is allowed to be long.

The results on the global LSA measures are in good agreement with previous studies on English that have compared LSA measures at different sample lengths (Heilmann et al., 2013; Tilstra & McMaster, 2007). As expected, and also in agreement with previous studies, it was found that those measures that involve absolute numbers of items or different items differ between sample lengths (such as TW, TDW, and MD), whereas measures that reflect an average (MLU) remain stable. A novel aspect of this study is a more detailed examination of grammatical morpheme diversity across different lengths, revealing that shorter samples do differ from longer samples, but in predictable ways. On average, four to five fewer different morphemes were seen in 25-utterance than in 100-utterance samples. Further, the specific morphemes that were most or least likely to be encountered were the same in long and short samples. Therefore, the pattern of morphological use seen in a short sample, coupled with the descriptive data for both sample lengths (Tables 5 and 6) does give a clinically useful indication of the variety of morphemes that most likely would been seen in a longer sample for the same child. Consequently, in contrast to Tilstra and McMaster (2007) and Heilmann, Nockerts, et al. (2010), who recommended that short samples be used for global measures only, it is proposed here that short samples can be used to estimate the outcomes that would have been found in a longer sample, not only for global measures, but also for morphological diversity. A shortcut estimation procedure was proposed whereby MLUw from a 25-utterance sample is used to predict not only MLU from a longer sample, but also which grammatical morphemes would likely be seen had a 100-utterance sample been collected and analyzed. The justification for this procedure was discussed in an earlier section; it is

based on the high correlations found between measures at 100 and 25 utterance lengths, including the high correlation between MLUw25 and MD100. Estimation procedures are commonplace in clinical practice and are necessary to strike a balance between accuracy of findings and clinical feasibility. Standardized tests of vocabulary and grammar test only a small set of items from which the child's broader language knowledge is estimated. Similarly, language samples of any length, including 100-utterance samples, are but an estimation of the child's countless spontaneous utterances produced throughout a day. Just as a standardized test does not presume to catalogue a child's entire language knowledge, but rather to estimate language level, a language sample provides an estimate of the child's ability to deploy linguistic structures to convey a message in a more spontaneous manner.

Clinical reference data for children with TD and LI

Results of this study provide descriptive data on several global LSA measures in Quebec French for five age groups of children between the ages of 2 and 6 years, including MLUw, MLUm, TD, TDW, MD, and the number of mazes in a sample. Although these data have to be used with some caution because of the small sample size of some of the age groups, the three middle TD age groups (3-, 4-, and 5-year-olds) are of considerable size and their value as a good indication of typical development of Quebec French should not be discounted. The youngest and oldest groups, although smaller, fit into an overall developmental pattern with the middle groups, with measures increasing systematically with age throughout the age range. A systematic and gradual increase in the means with age group as well as a systematic correlation with age show that each of the measures is sensitive to development; post hoc tests on the age groups of the TD children indicate that the increase is not significant between each successive age group, but rather, that a significant shift occurs between the two youngest age groups, on one hand, and the two oldest on the other hand. Although not tested statistically, this pattern is even more evident in the LI group, as seen in Figure 2. The relationship of language measures to age can be expected to be somewhat different for children with LI than children with TD because of variability in severity levels. Nevertheless, these findings raise the possibility that a growth spurt in language development occurs in French in the middle of the preschool years, warranting further research.

A previous study by Le Normand et al. (2008) provided data on French-speaking children in Paris. Their results are reported separately for children of different SES levels. However, a comparison of their MLUw data for 24, 36, and 48 month-olds reveals a rather close match with the present study for the 36 and 48 month-olds. In contrast, the Quebec French 2-year-olds achieve a considerably higher MLUw than their Parisian-French counterparts (2.17 vs. 1.36). Another difference in the datasets is that whereas there appears to be a slowing in MLU growth after age 4 years in the Paris data, no such slowing occurs in the Quebec data. The samples in the two studies cannot be compared directly because of differences in sampling context – the Paris samples were collected in a 20-minute interaction with a person familiar to the child whereas the present study used an unfamiliar examiner and a standard set of toys. It is nevertheless of interest to observe a fairly close correspondence between the two datasets. Clinically, these comparisons underscore the sensitivity of LSA to the elicitation context and the need to employ the same context as the reference base used to interpret the results; a finding reported previously in numerous studies (Elin Thordardottir, 2008; Hadley, 1998; Leadholm & Miller, 1992;).

Descriptive information on morphological development in this study confirms that of previous single-subject corpus studies (e.g. Bassano, 2000), showing an early preference for compound verb tenses, but also extends this information to higher age ranges, documenting the sequence of acquisition of more complex structures such as the conditional and subjunctive moods. At the age of 6 years, children are still not using a number of verb tenses, such as the passé antérieur (past anterior tense) and futur antérieur (future perfect tense), or the past tense of the subjunctive. Thus, unlike English, the full acquisition of French grammatical morphology types is not complete at this age.

Previous research had shown that young Quebec French-speaking children with and without LI differ significantly on MLU (Elin Thordardottir et al., 2011; Elin Thordardottir & Namazi, 2007). The present study further shows that they also differ significantly on all the other LSA measures, including vocabulary size and vocabulary diversity (TW, TDW), as well as in morphological diversity and the number of mazes. The group difference for each of these measures is statistically significant, and has a large effect size (Cohen's d exceeding 1.0), indicating a significant practical difference as well. This indicates that the language difficulty of the Quebec French-speaking children with LI is not restricted to one area of language, but rather extends across language domains. The effect sizes for the lexical domains are just as large as those for the morphological and syntactic domains. Children with LI produced significantly fewer mazes than children with TD. Although a high number

of mazes has been interpreted clinically as indicating word finding or syntactic formulation difficulties and therefore indicating impairment (cf. Elin Thordardottir & Ellis Weismer, 2002), normative data have also indicated that the number of mazes increases with increased MLU, being greater in the samples of older children and in more complex contexts (Leadholm & Miller, 1992; MacLachlan & Chapman, 1988). Therefore, a high number of mazes is not a clear sign of lower linguistic proficiency, in particular when factors such as length of utterance are not controlled. The lower number of mazes produced by the LI children is likely largely explained by the overall lower MLU and linguistic complexity of their samples. Further, when compared at comparable MLU levels, English-speaking children with LI have been shown to produce greater numbers of only certain types of mazes than children with TD (Elin Thordardottir & Ellis Weismer, 2002). Further research on maze production in French would be of interest.

The tables on morphological diversity indicate that children with LI proceed through a similar sequence of morphological development as do TD children. The morphemes that are relatively earlier or later developing are overall the same in the two groups. Although the relationship between MLU and the types of morphemes that can be expected to be seen in the sample are generally similar in the two groups, some morphemes are markedly less likely to be seen in the samples of children with LI than in samples of TD children of a similar MLU, or are not seen at all. These include notably some past and future verb tenses. In large part then, it appears that lower morphological diversity in LI samples is a reflection of an overall lower language level which does not provide many obligatory contexts for the missing morphemes - consistent with views of language acquisition that see the development of domains of language as being interconnected and interdependent (e.g. Marchman & Bates, 1994). The high correlations found between MD and both the MLU and lexical measures is consistent with a view of interrelated domains of language. However, some of the paucity of morphemes in the LI samples is unexplained by MLU, as determined by a comparison of what morphology is predicted by MLU group in TD and LI samples. Such a finding could be consistent with views that assume that LI presents a hindrance to the learning of specific morphemes (e.g. Rice & Wexler, 1996; Jakubowicz, Nash, Rigaut, & Gérard, 1999). Alternatively, it could also be that even at a similar overall language level, children with LI need more time or more practice to develop a greater variety of structures – they may need a larger critical mass of examples or may need more input to build the critical mass. Bilingual children who have received relatively little exposure to one of their languages have been shown to exhibit a pattern characteristic of children with LI in their spontaneous language production in that language, suggesting that LI patterns may be associated with little input or non-efficient use of input (Elin Thordardottir, 2015). It may also be that MLU may be too crude an index of overall language development to adequately address this issue. In future studies, a more in-depth analysis of sentence types and vocabulary use may provide a better understanding of the relationship between language domains in acquisition.

This study has contributed new insights into the effect of language sample length on LSA measures, including both global and more detailed morphological measures in a language that is more highly inflected than English. The findings have important implications for the development of LSA procedures in other languages. Comparatively to English, there appears to be lesser need for the routine morphological coding of French language samples if the goal is mainly to obtain MLU, as MLUw and MLUm were almost perfectly correlated. At the same time, detailed morphological information, in relation to age and MLU, does have important clinical uses, which could be exploited much more in clinical work in French than is currently being done. The data presented here suggest that MLU is a useful clinical measure in French, both as a rough estimate of language level in spontaneous production, as well as to set expectations as to which grammatical morphemes should be mastered by the child or should be emerging, and which morphemes are still out of reach, and thus, should not yet be targeted in therapy. A key component of widely used hybrid intervention methods combining aspects of naturalistic and more focused clinician-directed components, such as Focused Stimulation (Ellis Weismer & Robertson, 2006), is the careful selection of therapy targets appropriate to the child's linguistic level. The purpose of this selection is to ensure that the child has the necessary prerequisites to be able to learn the new target. In order to use this method, it is crucial to have a method to document the child's current level and to have information on the normal developmental sequence of the language in question, such as the data and clinical procedure presented here.

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Assessing Early Language Use by French-Speaking Canadian Children: Introducing the LUI-French

Évaluer l'utilisation précoce du langage chez les enfants franco-canadiens : introduction à la version francophone du Language Use Inventory

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KEY WORDS

PRAGMATICS
SOCIAL COMMUNICATION
EXPRESSIVE LANGUAGE
LANGUAGE ASSESSMENT
PARENT REPORT
LANGUAGE USE INVENTORY

Abstract

In the present article, we describe the translation of the Language Use Inventory (LUI) (O'Neill, 2009) from English to French and report findings on the French version's internal reliability and developmental sensitivity: critical steps prior to norming. The LUI is a parent report that can be used to assess how young children (18-47 months) use language for diverse purposes in daily life and to identify delays in pragmatics. Parents of French-speaking children (N = 242) filled out the questionnaire when their child was 18, 24, 30, 36, 42, or 47 months old. Cronbach's alpha for the LUI's three parts and for 11 of 12 LUI-French subscales ranged from .73 to .99, with most values in the .86 to .99 range, indicating good to excellent reliability. Factor analysis provided support for the ordering of the subscales. The LUI-French Total Score and subscale scores increased with age, as predicted, for both boys and girls, providing evidence of the report's developmental sensitivity. Girls, however, had higher total or subscale scores than boys at the earlier ages (18 to 36 months). This first study of the LUI-French confirms plans for further research that will culminate in a norm-referenced standardized measure for clinical practice.

Abrégé

Dans le présent article, nous décrivons la traduction du *Language Use Inventory* (LUI) (O'Neill, 2009) de l'anglais vers le français et nous présentons les résultats concernant la fiabilité interne et la sensibilité au développement de la version francophone, étapes cruciales et préalables à la normalisation. Le LUI est un questionnaire parental pouvant être utilisé pour évaluer la façon dont les jeunes enfants (18 à 47 mois) utilisent le langage à diverses fins dans leur quotidien et pour identifier les retards de pragmatique. Les parents d'enfants franco-canadiens (N = 242) ont rempli le questionnaire alors que leur enfant était âgé de 18, 24, 30, 36, 42 ou 47 mois. Les valeurs du coefficient alpha de Cronbach des trois parties de la version francophone du LUI et de 11 des 12 sous-échelles variaient entre 0,73 et 0,99, la plupart des valeurs se situant entre 0,86 et 0,99. Ces valeurs indiquent une fiabilité bonne à excellente. Les résultats de l'analyse factorielle supportent l'ordre des sous-échelles. Tel que prédit, les résultats totaux à la version francophone du LUI, ainsi que les résultat aux sous-échelles, augmentent avec l'âge autant chez les garçons que chez les filles. Ces résultats fournissent l'évidence que le questionnaire est sensible au développement. Néanmoins, les résultats totaux et les résultats aux sous-échelles des enfants plus jeunes (18 à 36 mois) sont plus élevés chez les filles que chez les garçons. Cette première étude sur la version francophone du LUI confirme nos plans concernant la réalisation d'une recherche supplémentaire dont le résultat sera une mesure standardisée et normalisée pour la pratique clinique.

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The present article reports the first validation study of the LUI-French, a tool for assessing young children's language use based on the Language Use Inventory (LUI; O'Neill, 2007, 2009). The LUI is a standardized parent report normed on a large, pan-Canadian sample of children. It is now widely used in clinical practice within Canada, the U.S., and abroad, and has been recommended to assess social (pragmatic) communication in various populations (Fujiki & Brinton, 2015; Tager-Flusberg et al., 2009). There is an urgent need for a similar measure in French. The study presented here constitutes the first step towards meeting this need. The study also provides a unique data set on pragmatic development by French-speaking toddlers and preschoolers in Canada, thus filling a significant gap in the research literature.

According to reviews of speech and language instruments published within and outside of Canada, no standardized, norm-referenced measure of pragmatics exists for French-speaking toddlers and preschoolers (Garcia, Paradis, Sénéchal, & Laroche, 2006; Pesco, 2011). The *Grille d'observation des habiletés pragmatiques des enfants d'âge préscolaire* [Pragmatic Skills Coding System – Preschool Version], an observational tool, was recently developed in Quebec (Blain-Brière, 2015), but is still under study. The Children's Communication Checklist-2, which includes pragmatic subscales, has been adapted from English to French in Canada (Vézina, Samson-Morasse, Gauthier-Desgagné, Fossard, & Sylvestre, 2011); however, it is designed for children 4-16 years old, beyond the ages we consider here, and has not yet been normed.

In addition to the dearth of instruments to assess pragmatics, empirical studies of early pragmatic development in French are rare. To give the reader some indication, Blain-Brière's (2015) extensive review of coding systems of pragmatic abilities yielded 20 studies involving preschoolers, none of which appeared to have included French-speaking children. Our own search of the literature (in both French- and English-language journals) on early pragmatic skills in French revealed only a few studies. These typically involved small samples and either had a different focus than the LUI (e.g., speech acts in Bernicot, 1992; understanding of non-literal language in Laval, 2004) or covered a narrower range of pragmatic abilities. Studies in the latter category, for example, investigated French-speaking children's internal state words (Kristen et al., 2014; Poulin-Dubois, Chiarella, & Polonia, 2009) and early narrative skills (Boisclair, Makdissi, Sanchez Madrid, Fortier, & Sirois, 2004; Leroy-Collombel, 2013). In these studies, the pragmatic abilities under study were observed at ages covered by the LUI (18 to 47 months) and appeared to emerge at roughly the same ages as they do in English. Thus, the studies suggest that related items on the LUI will be age-appropriate in French.

One might also expect items on the LUI to be relevant regardless of language, based on the assumption that pragmatic development is less language-specific than lexical or syntactic development. However, since linguistic and environmental (e.g., sociocultural) influences on pragmatics could result in cross-language differences, it is essential to study how French-speaking children respond to a version of the LUI specifically intended for them: the LUI- French.

The LUI-French mirrors the goals of the original LUI, published in English. Designed to assess the language use of children 18 to 47 months old, the LUI focuses on why children communicate (the purposes for which they use language); what they communicate about (e.g., objects, events, actions, emotions, mental states); and how they communicate (e.g., how they adapt their language to context). The emphasis on language use (used interchangeably with pragmatics here) contrasts with the focus on vocabulary or early grammar of other norm-referenced measures for preschoolers. While such measures provide valuable information about language acquisition, they often do not give speech-language pathologists (S-LPs) a good sense of the child as a communicator. The LUI fills this gap by systematically eliciting parents' knowledge about how their child uses language in daily life. It thus allows S-LPs or researchers to gather information that is relevant to a child's functioning and representative of their abilities, important aspects of ecological validity (Schmuckler, 2001).

Equally important, the LUI provides information about how a child uses language in social interactions. Difficulties with social communication characterize autism spectrum disorders [ASD] (Wetherby, Watt, Morgan, & Shumway, 2007) and pragmatic language impairment (Norbury, Nash, Baird, & Bishop, 2004). They are also a hallmark of social (pragmatic) communication disorder (SCD) (American Psychiatric Association, 2013). While some experts have questioned the scientific basis of SCD (Tager-Flusberg, 2013), some parents report that it describes their child "to a T" (see parental comments published in Tager-Flusberg, 2013). Delays in social communication have also been observed in other groups of children, such as those with specific language impairment (SLI) (Conti-Ramsden & Botting, 2004) and hearing impairment (Goberis et al., 2012; Nicholas, 2000). Children with Down syndrome also show more limited social communication than peers throughout the lifespan, though they show some

strengths in pragmatics relative to individuals with Fragile X and William's syndrome (Abbeduto, 2008). Additionally, preschoolers diagnosed with attention deficit hyperactivity disorder (ADHD) have difficulties with social use of language (Gremillion & Martel, 2014). Given that children in all of these groups may be referred to S-LPs, the LUI has an important clinical role in identifying and describing potential difficulties in social communication.

The LUI also reveals a child's strengths and can thus be used by S-LPs to articulate a balanced view of a child's abilities and to plan intervention. For example, knowing the purposes for which a child currently uses language can help S-LPs develop a treatment plan that builds on the child's knowledge and interests. Notably, researchers studying the LUI in clinical contexts have described it as a useful tool for S-LPs to set intervention goals in collaboration with parents (Foster-Cohen & van Bysterveldt, 2016). The LUI is also well-suited to evaluate the progress of children receiving speech-language services. For example, it is amongst the commonly used tools to assess children on the autism spectrum (Bland-Stewart, Townsend, Ortega, & Stewart, 2013) and has been recommended by an expert panel specifically to assess the expressive language progress of children with autism (Tager-Flusberg et al., 2009).

The LUI has additionally proven useful in experimental studies investigating the relationship of pragmatics/social communication to other facets of language or to development more generally. For example, LUI scores of children with Down syndrome have been found to correlate with their early word combinations, leading researchers to suggest that pragmatic development might facilitate syntactic development (Foster-Cohen, van Bysterveldt, & Davison, 2014). Children's scores on the LUI also relate to aspects of their behaviour. Rints, McAuley, and Nilsen (2015) found that at ages 3 to 4 years, typically-developing children's scores on the LUI were negatively correlated with the ADHD-related traits of inattention and hyperactivity-impulsivity. In another study, preschool-age siblings of children with ASD scored lower on the LUI than siblings of typically-developing children, confirming a risk of social communication deficits in the ASD-sibling group (Miller et al., 2015). Moreover, low scores on the LUI at 36 months were associated with internalizing problems in both sibling groups, and with externalizing problems in the ASD-sibling group. Such findings underscore the importance of language use in other developmental processes, and indicate directions for future research on clinical populations.

The original LUI is comprised of 180 items (i.e., questions) distributed across 14 subscales (Appendix A) that proceed roughly chronologically from asking about the child's gestures, to early words, and then to longer sentences. These subscales are separated into parts. Ten of the subscales (comprising 161 of the 180 items) contribute to the LUI Total Score. The remaining four subscales ask about gestures and the child's interests. The data from these supplement the LUI Total Score.

LUI items (both in the original and the LUI-French) focus on a child's current abilities and most require only a yes/no response, factors that aid parents in providing accurate reports of their children's development (Fenson et al., 1993). Most LUI items do not focus on the child's production of specific words. Instead, they ask about language use more generally, followed by examples of what a young child might say. These examples are intended to help parents recall and focus on the purpose of their child's language (rather than on its form). For instance, on an item asking whether the child talks about his or her name, the LUI-French examples of 'Moi Philippe' (Me Philip) and 'Je m'appelle Mathilde' (My name is Mathilde) indicate to parents that they can respond 'yes' to the question even if the child produces the less mature form.

Unlike existing criterion-referenced measures of pragmatics (e.g., the Pragmatics Profile of the *Clinical Evaluation of Language Fundamentals®—Preschool: Second Edition*; Wiig, Secord, & Semel, 2004), the LUI avoids frequency ratings of "appropriate" communication. Judgments of appropriateness are highly dependent on the situation and vulnerable to personal or cultural biases. The LUI takes a different approach. It emphasizes uses of language that emerge as a joint function of language development and the significant growth in social cognition that takes place during the preschool years (O'Neill, 2007, 2009). Moreover, in contrast with criterion-referenced measures, the LUI was normed on a large Canadian sample (N = 3,653), permitting norms for every month from 18 to 47 months (O'Neill, 2009).

Research on the original LUI has demonstrated its reliability and validity (O'Neill, 2007, 2009). Initial studies showed that parents were highly consistent in their responses when they filled out the LUI on two different occasions for the same child (test-retest reliability). Furthermore, the LUI was excellent at detecting language delays and distinguishing children with and without language delays (i.e., the LUI showed high sensitivity and discriminant validity) (O'Neill, 2007). In subsequent studies, children's scores on the LUI have been shown to correlate with their scores on other pragmatics-oriented assessments (i.e., the Communication and Symbolic Behavior Scales, reported in

O'Neill, 2009; the Communication subscale of the Adaptive Behavior Assessment System, as reported in Foster-Cohen & van Bysterveldt, 2016), as well as on experimental measures of pragmatics (specifically, children's ability to tailor requests to listener knowledge, examined by Abbot-Smith, Nurmsoo, Croll, Ferguson, & Forrester, 2015). These studies provide evidence of the LUI's concurrent validity. A study of the LUI's predictive validity further showed that children's LUI scores predicted later language outcomes. Children with low scores on language measures at 5 ½ years old (on average) were 27 times more likely to have scored low (at or below the 5th percentile) on the LUI in their earlier years (Pesco & O'Neill, 2012).

In summary, research has demonstrated the usefulness of the LUI in clinical practice and its strong psychometric properties. These encouraging findings have motivated us to translate the LUI into French and to examine the reliability of the French version and changes in French-speaking children's scores with age. Making a measure available in a language different than the original involves translating the text from the 'source' into the target language and adapting items as necessary. Translation typically follows back or forward translation. In back translation, the source is translated to a target language by one translator, and then translated back to the source language by a second translator. Back translation can be affected by differences in how well each translator understands concepts reflected in the measure. It can also encourage overly literal translations if the initial translator is aware that back translation will follow; consequently, translated items might sound less natural or be more difficult than the source version (Hambleton, Merenda, & Spielberger, 2005; Zucker, Miska, Alaniz, & Guzmán, 2005).

Forward translation is now generally favoured (Hambleton et al., 2005; Zucker et al., 2005) and was adopted in the present study (see Method). The approach involves a series of translations and reviews. Typically, the measure is first independently translated by at least two individuals to allow for regional differences in language (e.g., lexical choices) and variation in writing style. The translations are then reviewed by other qualified individuals and compared to the source measure. The reviewers select the most fitting translations or propose alternatives to accurately reflect the source version's content and accommodate linguistic or cultural differences between groups (Hambleton et al., 2005). The review process also involves ensuring clarity and an even style.

Following the initial translation of the LUI to French, we conducted a study to answer the following questions: (1) Do the LUI-French's subscales and parts demonstrate internal reliability? (2) How do the subscales factor on the LUI-French compared to the original LUI? (3) Do the LUI-French Total Score and subscale scores increase as a function of age? (4) Do the scores differ by gender?

To assess internal reliability, we calculated Cronbach's alpha coefficients. These indicate the degree to which items within a group (e.g., a subscale) are measuring the same construct. Researchers can also assess the influence of each item on the reliability of a subscale with other statistics, and based on these, decide to retain, omit, revise, or move items. The reliability of the original LUI was assessed using such procedures and proved high (O'Neill, 2007). We likewise anticipated high reliability for the LUI-French.

In factor analysis, the correlations between variables and the amount of variance that the variables explain are calculated to determine whether certain variables cluster together, revealing a hitherto latent 'factor'. For the original LUI, two factors emerged: gesture use and language use (O'Neill, 2007). As O'Neill explained, gestures (e.g., pointing, reaching) likely decreased as children began to express the same functions verbally, leading the gesture subscales to factor together but apart from the language-oriented subscales. We expected to find a similar pattern with the LUI-French.

Regarding the third research question, growth in scores with age was predicted based on studies of the original LUI and, when relevant, findings from the rare studies of pragmatic development of French-speaking preschoolers alluded to in the introduction. For the final question on gender, we expected higher scores by girls before 36 months, based on research showing that 2- and 3-year-old girls outperform boys on a variety of language assessments (Bornstein, Hahn, & Haynes, 2004) and norming data from the LUI, which consistently showed higher scores by girls than boys, and led to separate norms (O'Neill, 2009).

In addition to age and gender, we examined two other variables: level of maternal education and the percentage of time a child was exposed to a second language (see Method for details). Our goal was to determine whether these variables related to LUI scores in our sample and should therefore serve as covariates in the main analyses. Maternal education has been shown to affect children's language, and even to mediate the effects of socioeconomic status (Hoff, 2003), and could, we reasoned, influence the results here. We did not expect effects from second-language exposure at the exposure levels permitted (20% or less), but checked as a cautionary measure.

Method

Translation

Two assistants independently translated the LUI from English to French. Their translations included the instructions for completing the LUI, the items, and examples of children's utterances corresponding to the item. The assistants also translated questions regarding the child's health, development, language exposure, and demographics (see Materials and procedures, below). The assistants were selected based on their background knowledge of child development (gleaned partly from graduate-level studies and work with children) and fluency levels in French and English. Both were native Quebec French speakers (sequential French-English bilinguals). In addition to translating existing items, one of the assistants collaborated with the first author in generating examples for certain items on subscale N. While the original LUI did not provide examples for all items on this subscale, we felt parents would benefit from them.

Two S-LP consultants reviewed the translations: one residing in New Brunswick (where French is used widely) and the other in Quebec (where French is the majority language). Given our ultimate goal of developing the LUI-French for clinical use, we chose S-LPs with experience working with preschool-age children and parents. The first consultant (a native Quebec French speaker) reviewed the assistants' translations item by item, and either chose the best translation or proposed a third option to improve clarity or reflect regional variation. There was only one instance of the latter; the consultant proposed we add an example of a child's utterance using the phrase "à cette heure" ('now', in English) in addition to the existing example using the synonymous word "maintenant". The second S-LP consultant (a native bilingual speaker of Canadian French and English) then reviewed this newest (third) version of the LUI-French for clarity and the suitability of the examples of children's language for a pan-Canadian sample. The consultant also translated selected items on subscales C and N back into English to ensure the meaning of the original English item had been retained in the forward translation. Based on the review, minor changes were made to the wording and punctuation of some items and a few examples of children's utterances were adjusted to be more age-appropriate (i.e., to sound like something a young child might say). No other changes (e.g., to allow for regional variation) were deemed necessary. The second consultant and first author also jointly reviewed the translation of the health, development, and language exposure questions and made a few editorial changes, but there were no substantial modifications to content.

Three mothers were recruited by word of mouth to complete the LUI-French for their child (aged 2 to 4 years), and to comment on the clarity, completeness, and ease of responding to the questions. The three mothers had varying levels of education: secondary/high school (without diploma), college diploma (in Canada, 'college' denotes post-secondary but pre-university education), and bachelor's degree. Each mother was given a gift card to a bookstore to obtain a book for her own child as a gesture of appreciation. Feedback from the three mothers was positive; the LUI-French was described as clear, comprehensive, and easy to complete. Given the feedback, no further adjustments were made to the LUI-French. Appendix B lists the changes made to the wording and items while translating the original English LUI to French. The changes resulted in a final 177 items on the LUI-French (compared to 180 on the original LUI).

Readability measures were used to assess the instructions to parents in the questionnaire and LUI items that were in sentence form (items consisting of single words were excluded as these would deflate readability scores based on sentence length). Of the few available indices in French, some were not suited to a questionnaire (e.g., included paragraph length in the formula). Two indices were deemed appropriate and complemented one another. One was *AMesure*, an index based on the analysis of texts in a number of fields (Centre de traitement automatique du langage, n.d.). *AMesure* includes ratings of French sentence complexity and lexical difficulty: 1 and 2 indicate simple texts, 3 indicates text accessible to an average reader, and 4 and 5 indicate difficult and very difficult texts, respectively. The ratings for the LUI-French were 1 (simple) for sentence complexity and 2 (relatively simple) for lexical difficulty. We also calculated the *Laesbarhedsindex* (LIX), developed by Björnsson for Swedish, but tested on French and other European languages (Klare, 1984). LIX assesses readability based on average sentence length and the percentage of long words. On this measure, the LUI-French received a score of 33, described as "easy" on a 5-point scale of "very easy" to "very hard" (Luther, Snook, & Luther, 2014). Based on parental feedback and the *AMesure* and *LIX* indices, we concluded that the LUI-French was appropriate for parents with functional levels of literacy.

Validation

A cross-sectional design was used to investigate children's LUI-French scores at ages 18, 24, 30, 36, 42, and 47 months. Age group and gender were the between-group variables. Alpha was set at .05 for each comparison by group (rather than adjusted for multiple comparisons), consistent

with our goal of detecting any group differences that might exist. Internal reliability tests and factor analysis were also carried out to assess the properties of the LUI-French, followed by an analysis of correlations between subscales. Maternal education and degree of second language exposure were examined to rule out the need to control for these variables in the analyses.

Participants. Following approval of the research protocol by the human research ethics committee at Concordia University (Montreal), participants were recruited through parent information sheets distributed by daycare centres; announcements on Facebook pages or blogs visited by parents; flyers distributed or posted locally; mail or email to participants who had participated in previous research at Concordia University and had agreed to be contacted; and word of mouth. The variety of strategies was used to reach parents across Canada, but we focused on provinces with high proportions of francophones, namely Quebec, New Brunswick, and Ontario, which had francophone populations according to the 2006 Canadian census: respectively 79.6%, 32.7%, and 4.2% (Institut de la statistique du Québec et Secrétariat aux affaires intergouvernementales canadiennes, 2016).

To participate, a child had to be one of six ages: 18, 24, 30, 36, 42, or 47 months old, irrespective of days (e.g., children 18 months 1 day to 18 months 29 days were accepted). Upon completing the LUI-French, parents were also asked to provide demographic information and respond to questions about their child's health, development, and language exposure. Responses to these questions were used to implement exclusionary criteria applied in studies of the original LUI (O'Neill 2007, 2009). Specifically, children were excluded if they were (a) exposed to a language other than French more than 20% of the time since birth; (b) born 2 or more weeks prematurely and also had low birth weight (under 5 pounds 5 ounces); or (c) diagnosed with a language delay, developmental delay, hearing impairment, or medical condition likely to affect language development. We implemented criterion (c) to avoid having children in the sample who might be receiving intervention, as this could alter scores in ways we could not account for given the study's design. However, if children were only suspected of having a problem, we included them to ensure variability in the sample. Finally, children were excluded if the LUI-French questionnaire was not complete, or if a sibling was already participating in the study.

A total of 287 questionnaires were returned and 242 (84%) were included in the study. Twenty-five questionnaires were excluded due to: second language exposure over 20% (n = 12); incomplete or blank electronic form (n = 6); completed after or prior to the required ages (n = 5); current treatment for verbal apraxia (n = 1); and prematurity accompanied by low birth weight (n = 1). Another 20 parents voluntarily filled out the questionnaire for two of their children, but only one was selected for the present study to maximize the independence of observations. If both siblings met inclusionary criteria, we chose the sibling that would allow us to augment participants in each age group to target levels.

The participants are presented in Table 1 by age group: 18, 24, 30, 36, 42, and 47 months. We set out to recruit a minimum of 50 participants at 24 and 36 months and 30 participants at each of the other ages, but set no maximum. This strategy resulted in a range of 31 to 54 participants at each age. As Table 1 shows, the total sample of 242 children included 117 girls (48%) and 125 boys (52%), and the number of girls and boys at each age was roughly equal.

Table 1. Number of Participants by Age Group and Gender

Age Group	Gender		Total
	Boys	Girls	
18	15	16	31
24	29	25	54
30	19	21	40
36	26	25	51
42	20	15	35
47	16	15	31
Total	125	117	242

The number of parents who reported suspected difficulties with their child's speech ("pronunciation"), language, or hearing follows: speech, n = 7; language, n = 1; speech and language, n = 2; hearing, n = 3. These participants were included in the final sample. Most children were exposed only to French (n = 143, 59% of the sample), or exposed to another language about 10% of the time since birth (n = 75, 31% of sample). The remaining children (n = 24, 10% of sample) were exposed to a second language approximately 20% of the time. In most cases,

the second language was English, while smaller numbers of children were exposed to languages such as Arabic, Creole, Portuguese, Spanish, or Vietnamese.

All but one child was born in Canada. The vast majority resided in Quebec (96%), while a minority (4%) lived in the provinces of New Brunswick (n = 2) or Ontario (n = 8). In response to an open-ended question about ethnicity, parents most often described their child as Canadian (n = 111). Other responses included Quebecer ("Québécois(e)", in French) alone, or along with Canadian, French or Francophone (n = 49), and French-Canadian (n = 29). Together these constituted 78% of the sample. The remaining 53 responses included responses such as French alone, White or Caucasian, and Haitian (with each category representing < 5% of responses).

Income data provided by parents suggested the families were predominantly of middle to high socioeconomic status (SES): 90% reported 'before tax' income above $50,000 (the scale was intended to identify low-income families, and thus had $50,000 as an upper bound). Of the families with incomes less than $50,000, ten (4.1%) fell below low-income cut-offs (LICO), calculated with reference to community and family size (Statistics Canada, n.d.). This percentage was lower than the 13% of Canadian families in a low-income bracket in 2011 (Statistics Canada, 2011a). All mothers had at least a secondary school diploma; for 3.7%, this was the highest diploma earned. Others had a college or trade school diploma (31.4%); a university certificate (7.9%); a bachelor's degree (32.2%); a master's degree (20.2%); a post-bachelor's professional degree (1.2%); or a doctoral degree (3.3%). Although these data clearly show that educational levels were not homogenous, most participants (96%) were educated beyond secondary school. In comparison, 64% of Canadian adults surveyed in 2011 reported diplomas beyond secondary school (Statistics Canada, 2011b).

Materials and procedures. The LUI-French, described in the preceding sections, was provided to parents along with two sets of questions: one on the child's health, development, and language exposure, and the other on demographics, including the child's birthplace, child and parent ethnicity, family composition, parental education, parental occupation, and household income. The question types were yes/no (e.g., diagnosis of specific developmental delays); open-ended (e.g., contexts of second language exposure); and limited choice (e.g., parental educational level). The questions were highly similar to those reported in O'Neill (2007), with some minor adjustments (e.g., over the course of the LUI-French study, the wording of some questions was adjusted to be more appropriate for same-sex parents).

The LUI-French and the question sets just described were included in a single document in portable document format (pdf). The pdf file could either be printed and filled out by hand or filled out electronically. Parents who chose to fill it out electronically received it via email with instructions to complete it using free software (Adobe Acrobat Reader®), and returned it via email. Parents who chose to fill it out by hand received a printed copy and returned it by mail, in a stamped and pre-addressed envelope we provided. In both cases, an information letter and consent form were provided. Shortly after the completed consent forms and questionnaires were received, an age-appropriate gift (a book or activity book) was sent to the parent for the child described in the questionnaire, as a gesture of appreciation for the family's participation.

The scoring of the LUI-French items followed the scoring procedure of the original LUI. The 177 items of the LUI-French are comprised of 166 yes/no questions, and 11 frequency ratings on a 4- or 5-point scale (*never, rarely, sometimes, often*, and for gestures, *not anymore*). 'Yes' responses and frequency ratings of 'sometimes' or 'often' were awarded one point. 'No' responses and frequency ratings of 'never' or 'rarely' or 'not any more' (the latter uniquely for gestures) received a score of 0. The number of items for each subscale and part, provided in Appendix A, corresponds to the maximum score, since each item can receive a maximum score of 1. All 10 scored subscales in Parts 2 and 3 are summed to obtain the LUI-French Total Score of 159 (vs. 161 in the original LUI; see Appendix B for comparison). The remaining 18 unscored items of 4 subscales provide information that supplements the Total Score: 12 items devoted to gestures (subscales A and B); and 6 items regarding children's interests (subscales E and L). These unscored items are identical to the original LUI, with the exception of one fewer item in subscale A, as described in Appendix B.

Occasionally, we received incomplete LUI-French questionnaires. Parents were invited, via phone or email, to complete the questions. If the parent did not reply, or the child was no longer an appropriate age given the time between questionnaire completion and parent contact, we (a) retained the LUI-French if missing responses did not exceed 4 items overall or 2 within any subscale, and entered missing scores as 0 points, or (b) excluded the participant if missing responses exceeded these limits. When necessary, we also contacted parents for clarification of responses to the health, development, language exposure, and

demographic questions. For example, if the estimates and description of second language exposure did not coincide (e.g., childcare was in a second language but parent estimate of second language exposure was low), we clarified with the parent and adjusted their response as needed.

Responses to all LUI-French items were entered into SPSS (version 21) for analysis, along with the health, development, language, and demographic information, and the time parents took to complete the LUI-French.

Results

Parents reported it took, on average, just under 30 minutes to fill out the LUI-French questionnaire: $M = 29.8$ minutes, $SD = 11.6$. The time for completion did not correlate with the child's age (in months), but correlated weakly with the Total Score, suggesting that as affirmative responses to questions increased, so did the time for completion: $r = .186$, $p = .007$.

Internal Reliability

Cronbach's alpha was calculated for all subscales. As shown in Table 2, for Part 1 on gestures and subscale A, the alpha values were .86, well above a .70 value considered acceptable (Kline, 1999, cited in Field, 2009, p. 675), but the B subscale fell below the criterion. Notably, this subscale has only 2 items and the number of items influences alpha values (Field, 2009). The subscales in Parts 2 and 3 are more critical, since these contribute to the LUI Total Score. For these and seven of the ten subscales within them, alpha values ranged from .86 to .99, indicating excellent internal reliability. For the remaining three subscales (D, F, and J), the range was .73 to .78, indicating adequate internal reliability.

The corrected item-total coefficients (CITC) were also examined. It is expected that these correlations (between the item and sum of other items within the subscale) will be reasonably high if the items within the scale are measuring the same construct (.3 is thus suggested as the criterion level, e.g., Anastasi, 1988). For the 10 language subscales, comprised of 159 items in total, only 3 coefficients were below .3, in the .23 to .29 range. Removing the items improved alpha only minimally (e.g., from .73 to .74 on the F subscale); therefore, the items were retained.

Factor Analysis and Correlations of Subscales

To assess how the subscales of the LUI-French factored, an exploratory factor analysis with varimax rotation was conducted, using data from all participants. Two factors showed eigenvalues above 1; factor 1 eigenvalue = 8.377, and factor 2 eigenvalue = 1.138. The first factor explained 69.81% of the variance, while the second factor explained an additional 9.48% of the variance. As in the English LUI, ten language subscales comprise the LUI-French Total Score (see Methods; subscales related to children's gestures and interests are excluded). Eight of these ten subscales loaded positively onto both factors revealed by the factor analysis (for the remaining two, D loaded only on the first factor and J loaded only on the second factor). Given the overlap, the loadings were examined more closely. This examination revealed that Subscales C, F and G loaded more strongly onto the first factor along with subscale D, with loadings ranging from .75 to .84. The remaining subscales loaded equally (H and I), uniquely (J), or more strongly (K, M, and N) onto the second factor, with values ranging from .74 to .84. Subscale A (gestures) loaded negatively and relatively weakly onto both the first and second factors (-.35 and -.41, respectively), while the second gesture subscale B did not load onto either factor.

The results provide support for separating the gesture subscales from the language subscales for the LUI-French, as was done for the original LUI. In addition, the relative factor loadings (i.e., C, D, F, and G loading uniquely or more strongly to the first factor, H and I loading to both factors, and J to N loading uniquely or more strongly to the second factor) suggest that the ordering of the subscales on the LUI-French is appropriate and aligned with the ordering of the subscales in the original LUI based on developmental data (i.e., early-developing skills followed by later-developing ones). At the same time, the loading of most subscales on both factors implies that the LUI subscales assess the same underlying construct of pragmatics.

The correlations between subscales, presented in Table 3, likewise reflect the relatedness of the language subscales. For these, correlations were positive and moderate to strong. In contrast, gesture subscale A correlated negatively with the language subscales, reflecting the tendency for gestures to decrease as language increases. However, gesture subscale B did not correlate significantly with the language subscales, consistent with the factor analysis results.

Assessment of Potential Covariates

As planned, maternal education and language exposure were evaluated in relation to the LUI-French Total Score. The education variable was on an ordinal scale, ranging from 1 to 8 (less than secondary school diploma to doctoral degree). Spearman's correlation (appropriate for ordinal variables) did not indicate a significant relationship between maternal education and children's scores: $r_s(242) = .020$, $p = .68$. For second-language exposure, the three groups (0%, 10%, 20%

Table 2. Internal Reliability of LUI-French Parts and Subscales

LUI Parts and Subscales		Cronbach's alpha	# of items
Part 1	*Les gestes utilisés par votre enfant* (Your child's gestures)	.858	12
A	*Les gestes utilisés par votre enfant pour vous demander quelque chose* (How your child uses gestures to ask for something)	.863	10
B	*Les gestes utilisés par votre enfant pour vous faire remarquer quelque chose* (How your child uses gestures to get you to notice something)	.521	2
Part 2	*Les mots utilisés par votre enfant* (Your child's communication with words)	.941	30
C	*Les genres de mots utilisés par votre enfant* (Types of words your child uses)	.933	23
D	*Les demandes d'aide de votre enfant* (Your child's requests for help)	.757	7
E	*Les intérêts de votre enfant* (Your child's interests)	n/a	2[a]
Part 3	*Les phrases de votre enfant* (Your child's longer sentences)	.991	129
F	*Les mots ou phrases utilisés par votre enfant pour vous faire remarquer quelque chose* (How your child uses words to get you to notice something)	.727	6
G	*Les questions et commentaires de votre enfant à propos des objets* (Your child's questions and comments about things)	.903	9
H	*Les questions et commentaires de votre enfant à propos de lui-même ou d'autres personnes* (Your child's questions and comments about themselves/other people)	.978	36
I	*Les questions et commentaires de votre enfant lorsqu'il joue avec d'autres personnes* (Your child's use of words in activities with others)	.921	14
J	*La taquinerie et le sens de l'humour de votre enfant* (Teasing and your child's sense of humour)	.779	5
K	*L'intérêt de votre enfant pour les mots et le langage* (Your child's interest in words and language)	.862	12
L	*Les sujets dont votre enfant parle* (Your child's interests when talking)	n/a	4[a]
M	*Les conversations de votre enfant avec les autres* (How your child adapts conversation to other people)	.933	15
N	*Les mots que votre enfant utilise dans ses phrases complexes et ses histoires* (How your child is building longer sentences and stories)	.974	32

[a] Subscales E and L serve descriptive purposes only and are therefore not included in the items per Part here. However, they are counted in the total number of items, as shown in Appendix A.
Note. For further details about LUI items, please contact the corresponding author or consult O'Neill (2007), Table 1, p. 218.

exposure) were compared with univariate ANOVA and did not show a main effect: $F(2, 239) = .355$, $p = .702$. Given the lack of significant findings, neither variable was entered as a covariate in the main analyses.

Age and Gender Effects on LUI-French Scores

LUI-French Total Score was analyzed with univariate ANOVA for age, then gender. This strategy was preferred to two-way ANOVA (crossing age and gender) because univariate procedures in SPSS accommodate heterogeneous variance across the levels of a factor. Such heterogeneity was present in our sample; children's Total Scores were more spread out in the younger age groups, and Levene's test confirmed that the homogeneity of variance assumption was not met ($p < .001$). The homogeneity of variance assumption was met for gender ($p = .081$).

Age. The ANOVA showed an effect of Age Group on the LUI-French Total Score: Welch's $F(5, 103.81) = 234.013$, $p < .001$ (the within group *df* is reduced to provide a robust test of means). Figure 1 displays the growth in scores.

Post hoc comparisons were conducted following the ANOVA using the Games-Howell procedure (as appropriate in the case of unequal variance), and are summarized in Table 4. As the table shows, each younger group differed from the older groups, as anticipated, with one exception: the mean scores of 36-month-olds were not significantly different from 42-month-olds, but were in the expected direction (i.e., lower).

Figure 2 provides children's LUI scores by subscale, with scores expressed as percentages to facilitate comparisons across subscales with different number of items. As shown, scores on the longer gesture subscale (A) decreased with

Table 3. Spearman Correlations between LUI-French Subscale Scores

	B	C	D	F	G	H	I	J	K	M	N
A	.328*	-.490*	-.386*	-.450*	-.496*	-.539*	-.514*	-.422*	-.399*	-.475*	-.512*
B		-.112	-.037	-.107	-.082	-.084	-.057	-.036	-.078	-.110	-.068
C			.694*	.757*	.804*	.820*	.783*	.638*	.791*	.810*	.824*
D				.666*	.694*	.693*	.694*	.516*	.641*	.670*	.654*
F					.760*	.835*	.790*	.680*	.802*	.827*	.822*
G						.862*	.801*	.671*	.801*	.835*	.817*
H							.905*	.755*	.887*	.917*	.905*
I								.734*	.866*	.880*	.855*
J									.790*	.727*	.759*
K										.878*	.889*
M											.914*

* p < .0005

Table 4. Post Hoc Comparisons of LUI-French Total Score by Age Group

Age Group (in Months)	n	Mean (SD)		Significant Differences
18	31	32.03	(19.83)	--; 24; 30; 36; 42; 47
24	54	82.15	(27.19)	18; --; 30; 36; 42; 47
30	40	115.57	(23.41)	18; 24; --; 36; 42; 47
36	51	135.20	(15.37)	18; 24; 30; --; ns; 47
42	35	140.51	(16.85)	18; 24; 30; ns; --; 47
47	31	151.35	(7.61)	18; 24; 30; 36; 42; --

Note. *SD* = Standard deviation. The final column indicates significant differences between scores of children in the age group for that row and the age groups denoted. As the entries show, all contrasts except 36- and 42-month-olds were significantly different, $p < .0005$ for all comparisons except 42 months vs. 47 months, $p = .015$.

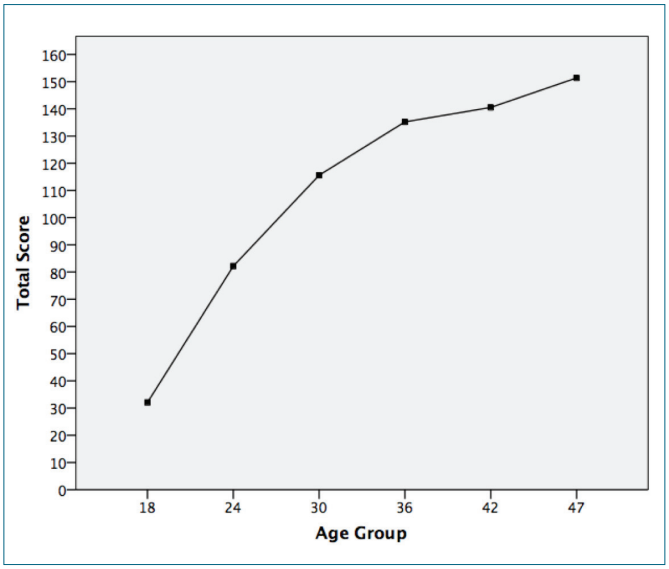

Figure 1. LUI-French Total Score by Age Group

age. This result was anticipated, since as children get older, words typically replace early communicative gestures. For subscales C-G, scores increased from 18 to 36 months, and then reached or approached ceiling. This pattern was not surprising, since the subscales were developmentally ordered in the original LUI, and that order was retained here and supported by factor analysis. For the remaining subscales H-K and M-N, scores increased up to 42 or 47 months. Figure 2 also shows that the lack of differences between 36 and 42 months observed on the Total Score did not extend to all subscales. In order to further explore the scores, independent t-tests were conducted. Scores increased from 36 to 42 months on subscale J, which addresses teasing and verbal humour, $t(84) = 2.21$, $p = .015$; subscale M, which covers conversations with others and narratives of personal experience, $t(84) = 2.08$, $p = .020$; and subscale N, which assesses the use of particular words to build longer sentences and express complex ideas, $t(84) = 2.73$, $p = .004$. In summary, the 36- and 42-month-olds were significantly different on those subscales designed expressly to capture children's later, more sophisticated language.

Spearman's rank-order correlations confirmed a relationship between age (months; days) and LUI-French Total Score: $r_s(242) = .832$, $p < .001$. Significant correlations between age and the subscale scores included in the Total Score were also found; for ten subscales, Spearman coefficients ranged from .601 to .821, $p < .0005$. Subscale A, a gesture subscale not included in the Total Score, correlated negatively with age, as predicted: $r_s(242) = -.521$, $p < .0005$. The shorter gesture subscale B did not correlate with age ($p = .125$).

Gender. Independent t-tests were conducted to compare the LUI Total Scores of boys and girls at each age. As displayed in Figure 3, girls scored significantly higher than boys at the ages of 18 and 30 months and neared significance at 24 and 36 months. The t-tests (two-tailed) follow: 18 mos. $t(21.82) = 4.75$, $p < .001$; 24 mos. $t(52) = 1.98$, $p = .053$; 30 mos. $t(38) = 2.59$, $p = .013$; 36 mos. $t(49) = 1.87$, $p = .068$. At 42 and 47 months, boys' mean scores appeared higher (by 4 and 2 points at the respective ages), but were not significantly different from girls: 42 mos. $t(33) = .678$, $p = .503$; 47 mos. $t(29) = .717$, $p = .479$.

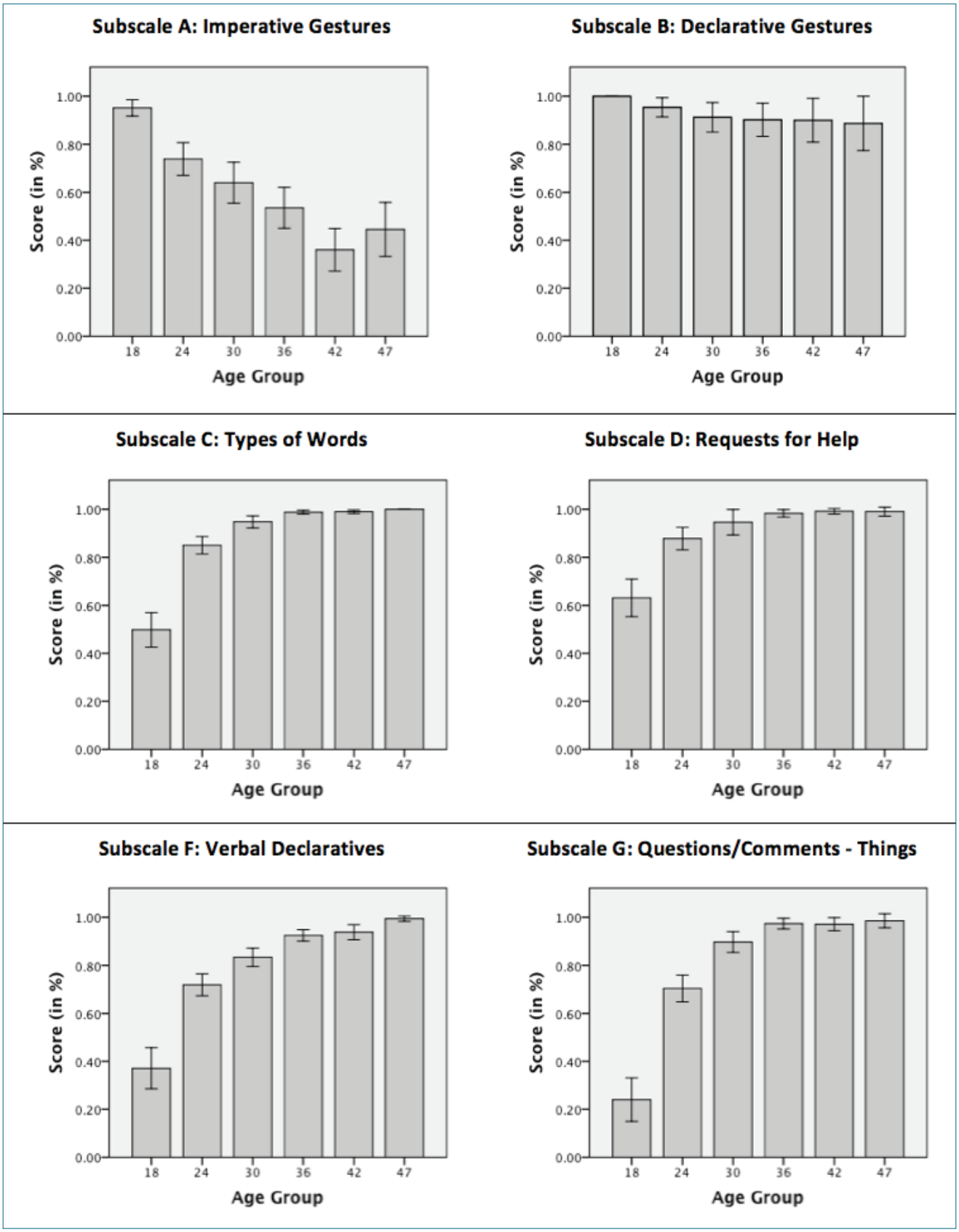

Figure 2. LUI-French subscale scores (expressed as percent) by age group (in months). The full names of the subscales are provided in Appendix A and also in Table 2. Error bars 95% CI

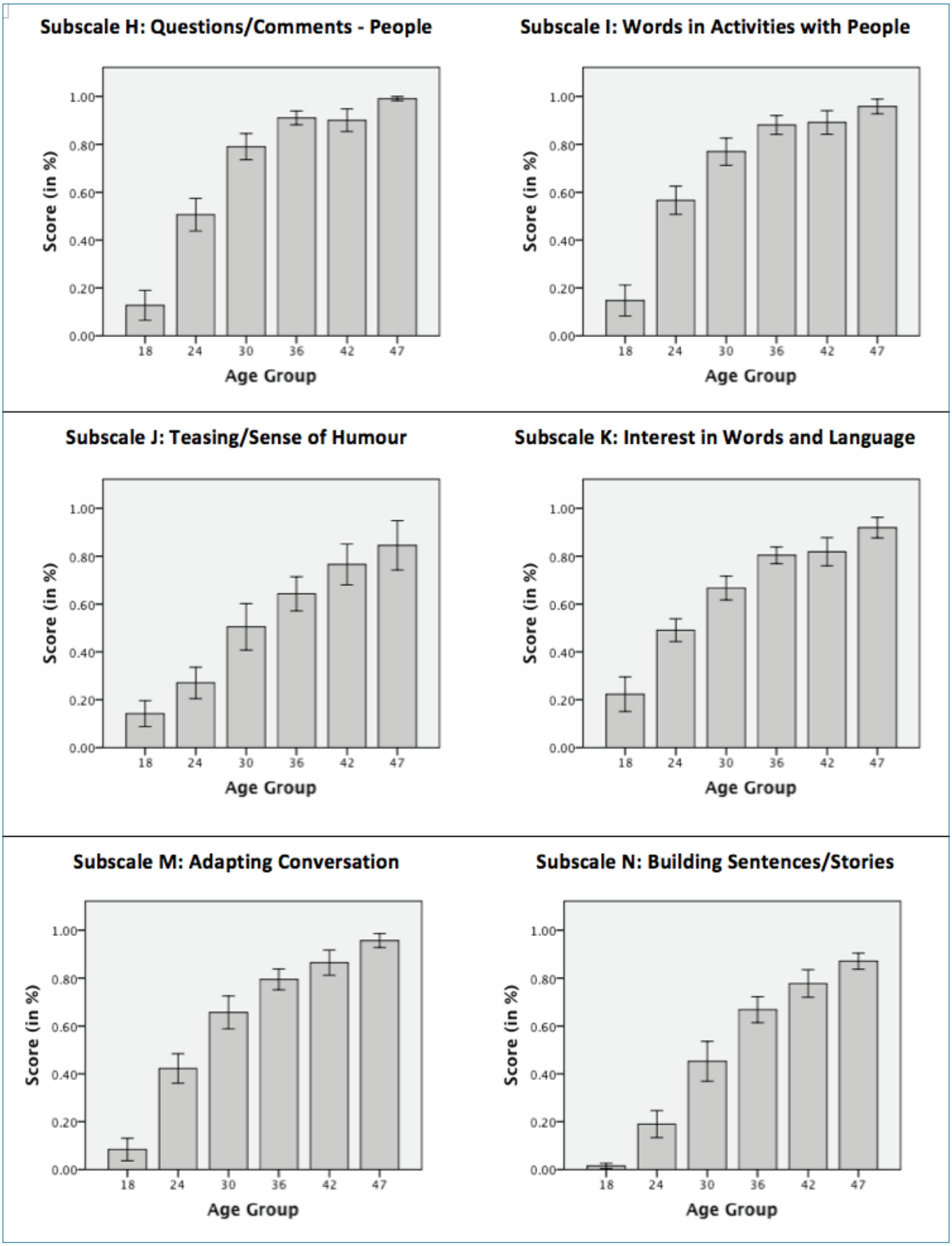

Figure 2. LUI-French subscale scores (expressed as percent) by age group (in months). The full names of the subscales are provided in Appendix A and also in Table 2. Error bars 95% CI

When the LUI-French Total Score was broken down by subscale, the results were similar. Table 5 displays the subscales on which girls scored higher than boys, in each age group. By 36 months, gender differences observed at the earlier ages were rare, and at 42 and 47 months, no significant differences were observed, in line with our predictions.

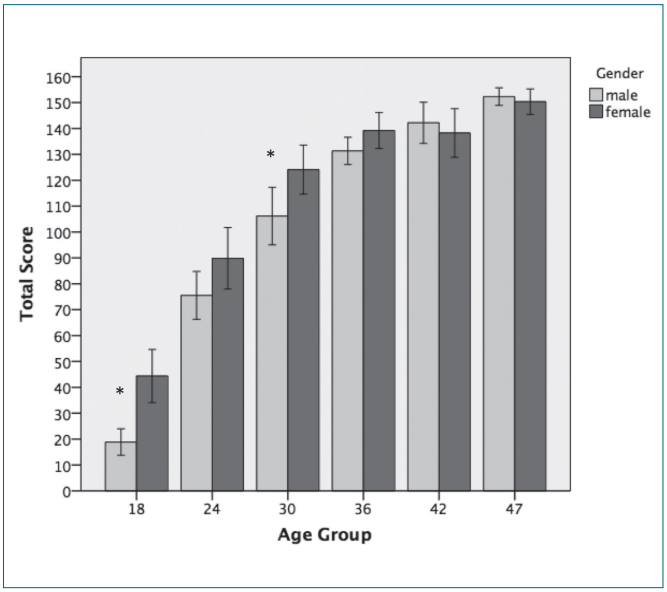

Figure 3. LUI-French Total Score by Age Group and Gender. Error bars 95% CI.
*$p < .002$. See text for remaining comparisons

Discussion and Conclusions

As standardized measures to assess preschoolers' language use in French are sorely lacking, we embarked on the translation of an existing tool: the Language Use Inventory (LUI). The basis and properties of the LUI were described at length in the introduction. In short, it is a questionnaire for parents, designed to assess language use by children 18 to 47 months old. Studies conducted in the second author's research lab have demonstrated the original LUI's reliability and validity (O'Neill, 2007; 2009; Pesco & O'Neill, 2012). Independent research teams have also documented the relationship of LUI scores to other facets of language (Foster-Cohen et al., 2014) or development (Rints et al., 2015), and demonstrated its usefulness in documenting social communication delays in at-risk populations (Miller et al., 2015). Importantly, the LUI is parent-friendly and also 'S-LP-friendly' in that it allows clinicians to get a comprehensive picture of a child's use of language, in a reasonable amount of time and cost-effective manner (Foster-Cohen & van Bysterveldt, 2016).

Translation

Given the assets of the LUI and the shortage of standardized, norm-referenced measures of pragmatics, the LUI has sparked interest internationally, and is presently being translated into eight other languages and adapted when necessary. Here, we reported on the translation into French, implemented following best practices, including

Table 5. LUI-French Subscales for which Girls' Scores Exceeded Boys' Scores, by Age Group

Age Group	Subscales Girls' Scores > Boys'									
18 months	C	D	F	G	H	I	-	K	M	-
24 months	-	D	-	-	-	I	-	-	-	-
30 months	-	-	F	G	H	-	-	K	M	N
36 months	-	-	-	-	-	-	-	K	-	-
42 months	-	-	-	-	-	-	-	-	-	-
47 months	-	-	-	-	-	-	-	-	-	-

Note. Results based on independent t-tests reported in text, $p < .05$, two-tailed. Boys' scores did not significantly exceed girls' scores on any subscale.

forward translation and review by child language experts and eventual users (i.e., parents). While the translation into French involved combining, replacing, or deleting some items to accommodate cross-linguistic differences, the adjustments led to changes to only 11 of the 180 original LUI items and a net decrease of only three items. Most (10/11) adjustments were in subscales C and N, which ask about the child's use of specific words; in contrast, the other subscales ask about the purposes for which a child uses language and give examples of what a child might say. In summary, the required changes were minimal, a finding that could facilitate cross-linguistic comparisons of children's performance on the original LUI and LUI-French in the future.

Internal Reliability and Factor Structure

Following translation, the LUI-French was analyzed in terms of its internal reliability and factor structure. The internal reliability of the LUI-French was assessed for all subscales and the three parts. The Cronbach's alpha values indicated adequate to excellent reliability: all values were in the .73 to .99 range (most exceeded .86), with the exception of B, the shorter gesture subscale that does not figure into the LUI Total Score. Examination of other statistics (CITC scores) did not indicate that any items should be eliminated or moved.

The subscales of the original LUI were developmentally ordered based on the research literature and the statistical analysis of data gathered during the validation phase (i.e., prior to norming). The factor analysis we conducted supported the same ordering for the LUI-French. The parallelism of the LUI and LUI-French suggests that pragmatic development in the two groups (English and French-speaking children in Canada) is following a similar pattern. The factor analysis and correlations also indicated that the LUI-French language subscales are positively and often strongly related. These results might be counterintuitive at first glance; one might expect each subscale to constitute a separate factor and to only be modestly inter-correlated. However, the original LUI was not constructed to identify sub-elements of pragmatics. Rather, it was developed to highlight important developmental tasks at various ages in the 18-47 month period, integrating various elements of pragmatics, and appears to achieve this goal in French as well as in English.

Age Effects on LUI-French Scores

The effects of age on the LUI-French Total Score and subscale scores were also examined. There was a significant main effect for age, with the 18-, 24-, 30-, and 42-month-olds each scoring lower than the older groups, as predicted. The LUI-French thus detects change with age, a critical quality given our long-term goal of establishing age-based norms. The only difference in Total Score that was not significant was between 36- and 42-month-olds, but the scores were in the expected direction (i.e., scores at 36 months were lower than at 42 months). With a larger sample, as planned for norming, a significant difference might be found. Moreover, significant differences were present when 36- and 42- month-olds were compared on subscales tapping verbal humour and discourse, found in the latter half of the LUI-French. Additionally, it is important to remember that the data reported here stemmed from cross-sectional comparisons (i.e., a group of 36-month-olds was compared to a different group of 42-month-olds). If one were to compare a single child or the same group of children on the LUI at 36 and 42 months, one might well observe statistically and clinically significant improvements. Given these important issues, and the overall results indicating strong age effects on the LUI-French scores, the data from this study indicate that the LUI-French is suitable for all the ages for which it is intended (18 to 47 months).

Another interesting finding was the variability observed in children's scores at different ages. The scores were most variable at the youngest age of 18 months, a finding in keeping with the original LUI and results for other language measures (see Pesco & O'Neill, 2012). From 18 to 30 months, the increases in the Total Score were the most dramatic. While scores continued to rise significantly after that point, the increases were not as large. However, it is possible that the most dramatic growth will occur at later ages for some children, particularly those with language delays. Rice's (2013) research, for example, shows that for children with language difficulties, language growth may follow the same trajectory as typical children, but begin later. Given this, one might observe the dramatic growth we see here from 18 to 30 months at later ages for children with language or pragmatic delays. Moreover, based on our experience with the original English LUI in clinical contexts, we know that children with language delays score quite low even at the later ages. Thus, while our results showed that children's scores tended to reach ceiling at the oldest age studied here (i.e., 47 months), ceiling effects are unlikely to occur amongst children referred for evaluation or on a clinical caseload.

Gender Effects on LUI-French Scores

We predicted gender differences based on past research and the original LUI. Although gender contributes

only small amounts of variance to language (Fenson et al., 1993), girls have been shown to be more advanced in language development than boys prior to the age of 3 years (Bornstein et al., 2004) and across ages in the norming sample for the original LUI (O'Neill, 2009). In the present study, we found gender differences at 18 and 30 months, and results nearing significance at 24 and 36 months. The latter results would have been significant on a one-tailed t-test, adequate for our hypothesis, but two-tailed tests were preferred to rule out results in the other direction (i.e., boys higher than girls). Thus, our predictions were largely substantiated and gender will remain a variable in the norming phase, described next.

Limitations and Future Directions

Given the findings overall, we conclude that the LUI-French demonstrates clear promise as a tool for assessing language use in early childhood. We intend to proceed with norming the instrument for clinical use, using a larger sample and likely narrower age bands (e.g., not only 24- and 30-month-olds, but also 27 month-olds). The study had some limitations that can also be addressed in the norming phase. One of these relates to the nature of the sample. Most parents who completed the LUI were of middle to high SES based on income. Although education levels were diverse, parents with low levels of education were underrepresented relative to national figures. While we found no relation of maternal education to the LUI-French scores, one might observe correlations in a sample with lesser education.

The participation of parents from provinces other than Quebec was also limited. This might have resulted from our selection criteria. To elaborate, outside Quebec, English is the majority language and rates of French-English bilingualism are high amongst native French speakers. For example, in New Brunswick, where French is widely spoken as a first language, rates of bilingualism are reported to be about 90% for adults 20 to 45 years old, and as high as 45% for children 0-4 years old (Lepage & Corbeil, 2013). In such contexts, children may be exposed to English at high levels and parents may not have contacted us because their child did not meet the criterion of predominantly French exposure noted in recruitment announcements. We plan to intensify and further diversify recruitment strategies in the norming phase to obtain greater representation of French speakers across the country. It is nonetheless possible that the LUI's focus on pragmatics will make it less vulnerable to regional variations in French than a measure of grammar or vocabulary. In fact, most of the LUI items are questions about the purposes for which the child uses language, followed by examples of what a child might say, rather than questions about specific words. The results observed may thus generalize to French-speaking children across Canada, a hypothesis to be confirmed in the norming phase.

In closing, we would describe parental response to the study as enthusiastic, based on the number of parents who agreed to fill out the questionnaire and their communication with us. This is a good sign that the LUI-French will be well-received and allow parents to play an active and, we believe, critical role in identifying pragmatic difficulties and strengths manifested by children throughout their day, and in a range of meaningful social interactions

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Appendix A

Names of LUI-French Parts and Subscales and Number of Items (English Names in Parentheses)

Bold type indicates components included in LUI Total Score

Name of Scales		# of Items
Partie 1:	*Les gestes utilisés par votre enfant* (How your child communicates with gestures)	
A:	*Les gestes utilisés par votre enfant pour vous demander quelque chose* (How your child uses gestures to ask for something)	10
B:	*Les gestes utilisés par votre enfant pour vous faire remarquer quelque chose* (How your child uses gestures to get you to notice something)	2
Partie 2:	*Les mots utilisés par votre enfant* (Your child's communication with words)	
C:	***Les genres de mots utilisés par votre enfant*** (Types of words your child uses)	23
D:	***Les demandes d'aide de votre enfant*** (Your child's requests for help)	7
E:	*Les intérêts de votre enfant* (Your child's interests)	2
Partie 3:	*Les phrases de votre enfant* (Your child's longer sentences)	
F:	***Les mots ou phrases utilisés par votre enfant pour vous faire remarquer quelque chose*** (How your child uses words to get you to notice something)	6
G:	***Les questions et commentaires de votre enfant à propos des objets*** (Your child's questions/comments about things)	9
H:	***Les questions et commentaires de votre enfant à propos de lui-même ou d'autres personnes*** (Your child's questions/comments about themselves/other people)	36
I:	***Les questions et commentaires de votre enfant lorsqu'il joue avec d'autres personnes*** (Your child's use of words in activities with others)	14
J:	***La taquinerie et le sens de l'humour de votre enfant*** (Teasing and your child's sense of humour)	5
K:	***L'intérêt de votre enfant pour les mots et le langage*** (Your child's interest in words and language)	12
L:	*Les sujets dont votre enfant parle* (Your child's interests when talking)	4
M:	***Les conversations de votre enfant avec les autres*** (How your child adapts conversation to other people)	15
N:	***Les mots que votre enfant utilise dans ses phrases complexes et ses histoires*** (How your child is building longer sentences and stories)	32
LUI-French Total Number of Items		177
LUI-French Total Score (Sum of Scores on Bolded Subscales)		159

Appendix B

List of Differences between LUI-French and Original

Summary of 11 changes	Items changed (by subscale)
Deleted 6 items (i.e., collapsed 11 items to 5 as translations identical to other item)	A: *looking at/towards* an object to request an action to single item C: *do* and *make* to verb *faire* N: *maybe* and *perhaps* to *peut-être*; *might* and *would* to conditional tense; *after, then,* and *next* to *après/ensuite*
Added 3 items to separate contrasts or capture the dual meaning of a word	C: divided *up/down/open/closed* to 2 items; *in/out/on/off* to 2 items; translated *on* as *sur* and in a second item, as *allumé*
Replaced 2 items with more appropriate ones in French	C: *get* replaced with *avoir (have)* N: possibly replaced with *probablement (probably)*
Net change in total # of LUI-French items = -3 (177 vs. 180 original LUI)	
Net change in # of items in LUI-French Total Score = -2 (159 vs. 161 original LUI)	

Nonstandard Dialect and Educational Achievement: Potential Implications for First Nations Students

Les dialectes non-standards et le rendement scolaire : les répercussions potentielles pour les élèves des Premières Nations

Patricia Hart Blundon

KEY WORDS

NONSTANDARD DIALECT

FIRST NATIONS ENGLISH DIALECTS

ABORIGINAL EDUCATION

ENGLISH AS A SECOND DIALECT (ESD)

Abstract

Students who speak a nonstandard variety (e.g., nonstandard dialect) of a language are at a disadvantage in classrooms that promote the standard. The struggles faced by such students are well documented on a global scale. Differences in pronunciation, grammar, vocabulary, and language use may be negatively related to school achievement. Teacher perspectives, inappropriate testing, and pedagogical strategies, can further negatively affect academic performance for students who speak nonstandard varieties. Canada is not immune to such issues. Indeed, they likely affect nonstandard speaking students in similar ways - in particular many First Nations students whose community language differs from the mainstream standard used in school. The intent of this article is to raise awareness about non-standard dialects and the challenges speakers, including many Canadian First Nations students, face in schools that promote the standard.

Abrégé

Les élèves qui parlent une variante non-standard d'une langue (p. ex. un dialecte non-standard) sont désavantagés dans une salle de classe faisant la promotion d'une langue standard. Les difficultés vécues par ces élèves sont bien documentées à l'échelle mondiale. Les différences sur le plan de la prononciation, de la grammaire, du vocabulaire et de l'utilisation du langage peuvent être négativement reliées au rendement scolaire. Le point de vue de l'enseignant, les évaluations inappropriées et les stratégies pédagogiques peuvent affecter négativement les performances scolaires des élèves qui parlent une variante non-standard d'une langue. Le Canada n'est pas à l'abri de ces problèmes. En effet, ceux-ci affectent probablement de façon semblable les élèves qui parlent une langue non-standard, particulièrement les nombreux élèves des Premières Nations dont la langue utilisée dans la communauté diffère de la langue dominante utilisée à l'école. Le but de cet article est de conscientiser le lecteur aux dialectes non-standards et aux défis auxquels les locuteurs, incluant les nombreux élèves des Premières Nations canadiennes, doivent faire face dans les écoles qui font la promotion d'une langue standard.

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In Canada, there is a substantial gap in school achievement between First Nations students and mainstream students. For instance, in British Columbia (BC), 21% fewer First Nations students graduate from high school within 6 years of entering Grade 8 than mainstream students (British Columbia Ministry of Education [BC MoEd], 2015). Since high school graduation and advanced education are predictive of future employment (Statistics Canada, 2015), educators and many Aboriginal leaders wish to narrow this gap (BC MoEd, n.d., Enhancement Agreements). Factors found to exist among Aboriginal children (including First Nations students) that may affect school performance include colonialism and poverty (Ball, 2007; Mendelson, 2008; Speech-Language & Audiology Canada [SAC], 2010), negative intergenerational effects of residential school (Schissel & Wotherspoon, 2003) including trauma (Bombay, Matheson, & Anisman, 2009), and lack of culturally appropriate resources to promote literacy (Ball, 2007). Lack of success can also be related to differences between home and school methods of pedagogy and cultural practices (see, for instance, Marker, 2006; Williams & Tanaka, 2007).

While these social, health, cultural, pedagogical, and political problems are important, an additional yet less-well-understood factor is nonstandard dialect (Ball & Bernhardt, 2008; Ball, Bernhardt, & Deby, 2007; Campbell, 2011). Among scholars in the area of language variation, it is broadly accepted that children who speak a nonstandard version of a language (i.e., nonstandard dialect) in schools that promote the standard version of a language are at an educational disadvantage (see, for instance, Fletcher, 1983, for English as spoken by "American Indians"; Labov, 1982, 1995, 2003, on African American English [AAE]; Malcolm, 1995, on Australian Aboriginal English [AE]). In Canada, many First Nations students appear to be speaking a nonstandard dialect (or variety) of English (Ball & Bernhardt, 2008; Battisti, Friesen, & Krauth, 2014; Epstein & Xu, 2003; Eriks-Brophy, 2014; Heit & Blair, 1993; Kay-Raining Bird, 2014; Peltier, 2009; Sterzuk, 2011; Toohey, 1986; Wiltse, 2011). However, the idea that their nonstandard dialect is a contributing factor to their lower academic achievement appears to be less well accepted. As a practicing Speech-Language Pathologist (S-LP) in both an urban setting in BC where First Nations students are the minority, and a remote community in northern BC where the majority of students are of First Nations descent, I have observed that the issue is not well understood by many educators, including S-LPs, if it is appreciated at all.

In order to increase my own and others' understanding of the issue, in the present paper I review research on nonstandard varieties, including those spoken by First Nations students, and the impact these may have on educational achievement. I will present evidence regarding ethnic nonstandard dialects used outside of Canada (e.g., AAE, AE), and where available, within Canada. Out of respect for Indigenous people's right to self-identify, I will use terms used by the author(s) I am citing, or by the Indigenous group (e.g., First Nations, Native Americans, American Indian, Alaskan Native, Aboriginal, etc.). I hope that this article will raise awareness about nonstandard dialects and the challenges speakers, including many Canadian First Nations students, face in schools that promote the standard. Also, it is hoped that educators and clinicians will be inspired to learn more about the First Nations Englishes being spoken by their students, and to collect data so that dialect-sensitive assessment and teaching practices can be implemented.

What is a Nonstandard Language Variety/Dialect?

In my experience, there is confusion among educators, including S-LPs, as well as the general public, about the meaning of the terms *nonstandard variety* and *dialect*. Furthermore, there are different understandings of the meaning of the terms *language* and *standard language*. Before examining how nonstandard dialect may affect speakers in school, I will first attempt to clarify the meaning of these somewhat confusing terms.

What is Language?

Language is complex and has thus been defined in multiple ways (Halliday, 1969). According to the American Speech-Language-Hearing Association (ASHA, 1982), "Language is a complex and dynamic system of conventional symbols that is used in various modes for thought and communication" (Definition of Language, para 1). Modes can include speech, reading, and writing. In the field of speech-language pathology, language has often been described in terms of three domains, *content, form,* and *use* (Bloom & Lahey, 1978); a) *content* refers to the meaning or semantics conveyed by the words in a message, b) *form* refers to the structure of language, specifically phonology, morphology, and syntax and c) *use* is concerned with the pragmatic functions of language (i.e., the reasons people use language, discourse skills such as turn taking, topic maintenance, etc., and how speakers adjust their language depending on the communicative environment) (Paul, 2007, pp. 5,30). This way of thinking about language is still used by scholars (e.g., Paul, 2007) and will be the framework adopted in this article when discussing the impact the differences, between the standard and nonstandard varieties, have on speakers in school.

What is a Standard Language Dialect?

The standard language is the version of the language that has been standardized and codified in dictionaries and grammar books (Trudgill, 1999). Influential people with perceived status, such as teachers and employers, determine what the acceptable standard is (Wolfram & Christian, 1989). However, linguists argue that the standard is actually a "myth" (Lippi-Green, 1997, p. 53) because variation is present, even among people who speak the so-called standard version of a country or region's language. The standard in Canada, "*Canadian English* is a branch of North American English, sharing many of its accent and dialect features with northern United States varieties" (Chambers, 2009, p. 60).

Labov (1995) refers to the English that is expected in school as "standard classroom English" (p. 9). Also known as *school English*, the English that is expected at school *largely* conforms to the rules codified in grammar books (Charity Hudley & Mallinson, 2011), although there are differences between schools and regions (Charity Hudley & Mallinson, 2011) and from elementary to high school, as the classroom switches from emphasizing narrative to expository language (Miller, Andriacchi, & Nockerts, 2011). When speaking the standard, Charity Hudley and Mallinson (2011) suggest that students will likely be encouraged to articulate their words clearly, and avoid deleting final consonants when speaking, an articulatory pattern typical of many nonstandard varieties of English. Students will be encouraged to use the standard when speaking (e.g., use indefinite article *an* instead of *a* before a word beginning with a vowel) and writing, and use more literary language. In addition, English-speaking students will be required to use School English discourse. The style of classroom discourse may vary. Some teachers adopt, for instance, a dialogic approach, whereby students are encouraged to learn by ongoing interactive talking (Alexander, 2006). Other classrooms support more traditional forms of instruction such as teacher Initiation, student Response, and teacher Evaluation (IRE) (Cazden, 2001). Students who speak the nonstandard may not be familiar with classroom discourse, and the rules regarding classroom dialogue may not mesh with their cultural values or styles of language use (Cazden, 2001; Philips, 1983; Ward, 1990). To acknowledge that nonstandard speaking children are learning a foreign dialect in schools, other terms used when speaking of dialect use in educational settings include "Standard English as a Second Dialect (SESD)" (Sato, 1989) and "English as a Second Dialect (ESD)" (BC MoEd., 2013).

What is a Nonstandard Variety/Dialect?

A technical definition of dialect is "any given variety of a language shared by a group of speakers" (Wolfram & Christian, 1989, p. 1). Given this definition, no one variety of language is superior to another, and even the standard is a dialect. However, a more popular definition of dialect, applied to English, is "a particular social or geographical variety of English that is not the 'standard' one" (Wolfram & Christian, p. 2). One might, therefore, ask, "Why is a nonstandard variety singled out as being a dialect?" Lippi-Green (1997) argues that we use the term *dialect* as a vehicle of exclusion. Those who speak the standard single out the nonstandard variety to subordinate it and its speakers, because "we are forbidden, by law and social custom, and perhaps by a prevailing sense of what is morally and ethically right, from using race, ethnicity, homeland or economics more directly" (p. 64). Another reason "dialect" has taken on a negative connotation is because some scholars and researchers have regarded nonstandard dialects as restricted language codes, associated with verbal deprivation and decreased intelligence. Bernstein (1972), for instance, argued that the language of middle class children was characterized by a use of elaborated codes, whereas the language of working-class children, many of whom spoke nonstandard dialects, was characterized by restricted codes that restricted their ability to learn. However, linguists have demonstrated that dialects are not restricted; all varieties have a complete set of grammatical rules and conventions of use (Fought, 2006; Labov, 1982). In addition, the idea that speakers of nonstandard dialects are less intelligent than non-speakers has been utterly refuted (Campbell, Dollaghan, Needleman, & Janosky, 1997; Fletcher, 1983; Rodekohr & Haynes, 2001). Nonetheless, because of the stigma associated with the popular use of the term *dialect*, terms such as "language variety", "language difference", and "linguistic diversity" are often used when speaking about dialects (Wolfram & Christian, 1989, p. 2).

Nonstandard varieties can be associated with regions (Siegel, 2010), ethnicity (Benor, 2010; Siegel, 2010), gender (Mallinson, 2009), age (Wolfram & Christian, 1989), and social class or socioeconomic status (Holmes, 2008). Dialect can even be associated with "coolness"; Eckert (2008) found differences in the patterns of speech among cliques in schools in California, with students adopting the variety of speech patterns of the group with whom they identified. Siegel (2010) suggests that varieties can be indigenized, whereby a nonstandard variety is the lingua franca (or the common language) used by indigenous peoples (e.g., Fijian English), and the standard used in school is spoken in a foreign country (e.g., British English). Varieties can exist in diglossic settings, whereby the colloquial variety is used in informal settings (e.g., Cypriot Greek), with the standard used in more formal settings such as school (e.g.,

Standard Modern Greek) (Siegel, 2010). Creoles, Siegel explains, are also considered dialects and often arise in situations when the language of a colonizing power is taught in school. Ethnic dialects may derive from an ancestral language (see Leap, 1993, on the origins of Native American Englishes) or as a consequence of second language learning of a dominant language with no formal language instruction (Ball et al., 2007). Dialects may entrench and persist when speakers of the dialect become isolated geographically (Ball et al., 2007), economically (Labov & Harris, 1986; Rickford et al., 2015), or socially (Holmes, 2008). Benor (2010) further proposes that dialects persist when speakers adopt a particular repertoire of features to identify with a certain group. The decision to speak a certain way to maintain identity with a group can bind a community together, but can also become an obstacle to learning the standard that is expected in school (Siegel, 2010). Finally, since dialects are varieties of language, and language varies, there is variation in the way people speak a dialect. As Wolfram and Christian (1989) point out, "dialects simply do not come in neat, self-contained packages" (p. 6).

Students Who Speak Nonstandard Dialects and Educational Achievement

Many students who speak a nonstandard dialect, have lower educational achievement than peers that speak the standard. For instance, Biddle (2013) reported that Australian Aboriginal students, the majority of whom speak AE (Eades, 2013), failed to reach the same level of academic achievement as students who speak Standard Australian English, even when controlling for socioeconomic status (SES), school sector (Government, Catholic, or other Independent schools), and geography. In 2015, in Arizona, US, only 66% of Native Americans graduated, the lowest rate among ethnic groups in the state (Arizona Department of Education, 2016). According to Leap (1993), American Indian English is the first language learned by two thirds of Native American youth. Differences in content (vocabulary and meaning), form (pronunciation and grammar), and language use have been shown to affect school performance.

Content

The words that nonstandard dialect speakers use may differ from those used by speakers of the standard (Wolfram & Christian, 1989). Charity Hudley and Mallinson (2011) argue that speakers of nonstandard dialects may have fewer "academic" and "literary" standard English (SE) words, or may not know that the vocabulary they use in day-to-day situations differs from what is expected at school (p. 26). Having fewer Mainstream American English (MAE) words in one's lexicon has been found to interfere with comprehension. Edwards et al. (2014), in their study of the relationship between dialect and lexical comprehension among AAE-speaking children aged 4 to 8 years, found that children with fewer MAE words had more difficulty with comprehension of such words in school, and higher use of AAE was also associated with greater difficulty. However, in the case of vocabulary, low SES may also be a factor for children. In their study of White and African-American dialect-speaking children in Grade 1, Terry, Connor, Thomas-Tate, and Love (2010) found that for children attending schools of low SES (measured by the percentage of children who qualified for the Free And Reduced Price Lunch Program [FARL]), the relationship was negative and linear. Since poverty has been found to be associated with lower vocabulary achievement (Hart & Risley, 2003), the authors suggest that home learning environment may be a more critical factor for vocabulary development for children from low SES homes than dialect per se.

In Canada, vocabulary differences may cause similar difficulties for First Nations students. First of all, First Nations students may not know as many SE words. Philion and Galloway (1969) found that children of First Nations ancestry in BC obtained lower scores on tests of reading vocabulary than their non-First Nations peers, which they suggested were due to differences in the First Nation students' world knowledge and experience. A vocabulary gap may put students at a disadvantage in schools that promote the standard since vocabulary knowledge is predictive of literacy acquisition (National Early Literacy Panel, 2008) and later school achievement (Hart & Risley, 2003). Secondly, First Nations students who speak nonstandard varieties may not know meanings of words that are important for learning in school. For instance, Colleen Bovaird Wawrykow, a Canadian S-LP who has experience working with First Nations children in Central Vancouver Island and is a member of the Skuppah Band of the Nlaka'pamux First Nation B.C., has observed that First Nations kindergarten students seem to have difficulty with school readiness concepts (letters, shapes, colors, and comparisons), as well as vocabulary for time, direction, position, quantity, and sequence (Wawrykow, 2011).

Form

Phonology, phonological awareness, and literacy. The sound systems of nonstandard dialects usually differ somewhat from the standard. For example, in AAE, cluster (or blend) reduction is common (Charity Hudley & Mallinson, 2011; Wolfram & Christian, 1989); *walked* may be pronounced as *walk* and *best* pronounced as *bes*. In

the case of *walked*, the loss of the *ed* also results in a loss of a SE morphological marker of past tense. Final voiced consonants such as /b/, /d/, and /g/ can become devoiced (produced without voice) and pronounced as [p], [t], and [k] (Charity Hudley & Mallinson, 2011). Differences in pronunciation are also characteristic of speakers of Native American Englishes (Leap, 1993). For instance, speakers may delete, devoice, or modify their production of word-final consonants and consonant clusters (Fletcher, 1983; Leap, 1993), similar to what is observed in AAE.

Differences between sound systems of nonstandard and standard dialects may lead to difficulties in acquisition of literacy skills for nonstandard speakers. Labov (2003) argued, for example, that if a student who speaks AAE normally produces [uw] instead of allophone [l] in word-final position of the word "*people*", then the student may not be able to rationalize the use of < l > in this position in the written word (p. 130). The idea that mismatches between the pronunciation of words in nonstandard dialect and in SE may cause spelling problems is supported by research. Cronnel (1984) found that African American children from a predominantly AAE-speaking school tended to omit the final consonant when writing words in Standard American English, being influenced, they argued, by AAE speech (e.g., "left" is pronounced as "lef" [p. 234]). Similarly, in their research, Treiman and Bowman (2015) found that students who spoke AAE had more difficulty spelling words with final *d* and were likely to substitute a *t*, related, they argued, to the AAE dialectal feature of final obstruent devoicing (i.e., the final consonant of a word is pronounced without voice, as in *pad* is pronounced as *pat*). I, and the teachers with whom I work, have observed similar spelling errors among children in northern BC. Students who do not pronounce final consonants may leave them off when writing (e.g., *I walked* [pronounced as walk by nonstandard speakers] *to the store* is written as *I walk to the store*). As is mentioned above, the loss of the *ed* also results in a loss of a SE morphological marker of past tense. Brown et al. (2015) also found evidence that nonstandard dialect causes difficulty for children required to read in the standard dialect. They found that AAE-speaking children had more difficulty reading out loud. They concluded that children who speak a nonstandard dialect have more difficulty learning to read because their dialect affects their ability to map sounds to letters, making the task complexity greater than it is for students who speak the standard.

Dialect may also influence phonological awareness, a skill found to be predictive of literacy acquisition (NELP, 2008). Terry, Connor, et al. (2010) found a negative relationship between density of dialect use and phonological awareness among typically developing first graders who spoke a variety of English that differed from MAE. This negative relationship occurred for both White and African American students who spoke what the authors referred to as Non-Mainstream American English [NMAE], regardless of the SES level of the school they attended. Continuing her investigation of the relationship between phonological awareness, dialect, and reading, Terry (2014) again found a negative relationship between dialect use and reading, even though NMAE speakers demonstrated they had phonological knowledge of both NMAE and MAE dialects. However, when phonological awareness was added as a factor, dialect was mediated by phonological awareness. She proposed that the multiple representations the NMAE-speaking children have as bidialectal speakers causes them confusion when reading. Children who have reduced awareness about the need to manipulate language flexibly, a skill that is measured by tests of phonological awareness, may be particularly affected.

In summary, then, studies indicate that speakers of nonstandard dialects have difficulties with spelling and decoding. Their difficulties may be due to the mismatch between the sound systems of their dialect and the standard and/or their lack of awareness of the need to switch between the two dialects.

Grammar/Morphosyntax. Nonstandard dialects often have grammars that are very different from the standard. Miller et al. (2011, p. 123) list numerous features of AAE such as: a) deletion of the copula (e.g., "*she hungry*", p. 118) and auxiliary (e.g., "*they* _____ *cathin' a bus*"); b) differences in subject-verb agreement (e.g., "*they was sittin' down*"; c) use of undifferentiated pronoun case (e.g., "*them pullin' them up the hill*"); d) non-use of past tense (e.g., "*then he fix the food*"); e) non-use of "to" in the infinitive (e.g., "*he waitin' for the rain* _____ *go*"); f) use of appositive pronoun (e.g., "*the other ones, they didn't have nothin'*"); g) multiple negation (e.g., "*you don't want nobody to put none*") and so on, and one or more features may be present in up to 50% of utterances (Miller et al., 2011, p. 115). Grammatical differences between Native American Englishes and Standard American English can also be considerable (Bayles & Harris, 1982; Fletcher, 1983; Leap, 1993). Leap (1993, pp. 53-78) lists many features distinguishing Native American English from the standard, including: a) more more infrequent use of the plural and possessive /s/ and /z/; b) addition of a plural marker for count nouns (e.g., "*furnitures*") or deletion of the plural marker where it is required; c) differences in article and demonstrative use, such as omissions (e.g., "*He asked shopkeeper for sheep*"); d) differences in pronouns such as inconsistent use of SE

gender distinction for third person singular "*he, she, it*", or a tendency to omit pronouns, particularly for subject markers (e.g., "*[ ] was playing*"); e) differences in verb tense and aspect (e.g., "*The girl run up to me and she said*"); f) use of adverbs to clarify or provide additional perspective on tense and aspect, (e.g., "*They had a Kiva, made out of rocks, yet*") where *yet* indicates the statement is factual; f) use of *get* as an auxiliary (e.g., "*he got voted in*"); g) copula and auxiliary deletion, (e.g., "*She a red corn people*"); g) subject-verb agreement (e.g., "*I were looking for deer*"). Bayles and Harris (1982) also note regularization of irregular verbs (e.g., *He blowed that balloon*) and use of topicalization (e.g., *That boy, he…*). Other differences occur at the sentence level. For instance, the Australian Curriculum Assessment and Reporting Authority (2014) indicates that speakers of AE find it challenging to understand and use complex sentences.

In Canada, information about the grammatical features of First Nations English dialects is scant (Ball et al., 2007). However, published manuscripts and anecdotal reports indicate that the way many First Nations people in Canada speak English can be very different from the way mainstream Canadians speak English. Using a manuscript written in the 1950's, essays and exercises written by Blackfoot university students from 2008 – 2009, and their own observations, Genee and Stigter (2010, pp. 65-77) reported morphosyntactic differences such as: a) verbs verbs uninflected for tense (e.g., "*after he eat, it was dark*"); uninflected participles (e.g., "*he was badly scratch and biting*"); omission of "to" in the infinitive (e.g., "*they started [to] dig under their bed*"); omission of auxiliary "to be" (e.g., "*they [are] gonna say no*"); differences in number marking (e.g., such as absence of the plural (e.g., "*See these wire*"); differences in mass nouns (e.g., "*We look for stuff that are very similar*"); omission of personal pronouns (e.g., "when she got up [she] went outside"); neutralization of gender (e.g., "*So this old crow woman said to himself…*"); use of nonstandard possessive determiners (e.g., "*w[h]ere is all you stuff?*"); and omission, redundant use, or substitution of articles (e.g., "*this hill had [a] lot of trees*", "*The theme to this story is the colonialism*", "*he put him in a shade by a big tree*"). Grammatical features reported by participants at a First Nations English dialect forum, sponsored by The University of British Columbia and the University of Victoria, included differences in pronoun use, use of tags such as "*init*" for '*isn't it*', and the tendency to "string together phrases without the use of conjunctions such as *and*" (Ball & Bernhardt, 2008, pp. 578-579). Bennett (2008) reported that differences in word order may be present; Leap (1993) suggests word order differences may have their origin in the ancestral language. In northern BC, I have observed that children produce word-level differences in verb derivation (e.g., He kickeded the ball.), prepositions (e.g., The girl got along/out of the way.), pronouns (e.g., Her/he gave him a ball.), negation (e.g., I not know.), and determiners (e.g., The girl is tryin' to get [ ] apple.). Words expected in Standard Canadian English may be omitted, and simple sentence construction is preferred (e.g., child says, "Done. Left." rather than, "When they were done, they left."). Students may use different word order than is typically used in SE. For instance, use of topicalization is common, such that the topic is stated first and then elaborated upon (e.g., That bull, he was mad). Students may also use "here" instead of the conjunction "then" when telling stories (e.g., "and here she ran" rather than "and then she ran"); to my knowledge, this is a previously unreported feature. The use of dialect can be widespread; upon school entry, I have observed that up to 60% of a child's utterances in an oral narrative language sample may contain differences.

Substantial differences in grammar noted between nonstandard varieties and the standard can cause difficulties in school for nonstandard speakers. When Labov demonstrated that AAE has a regular structure and its own set of rules during the *Black English Trial*, the judge ruled that the AAE-speaking students' use of this variety of English was interfering with their success in school (Baugh, 1995). Several recent studies support this proposition, showing a negative relationship between density of dialect use and reading achievement (Charity, Scarborough, & Griffin, 2004; Craig & Washington, 2004; Terry, Connor, Petscher, & Conlin, 2012). Furthermore, if elementary students shift to using MAE as they progress through the grades, their literacy achievement increases (Craig & Washington, 2004; Terry et al., 2012). Density of dialect has even been found to have an independent, negative relationship to reading when controlling for SES. Craig, Zhang, Hensel, and Quinn (2009) found that density of dialect in written narratives had a significant negative direct effect on reading achievement among elementary school students who spoke AAE; density of dialect in oral narratives had a negative indirect effect that was mediated by language comprehension. Their model, which also included a measure of SES (i.e., the Hollingshead Index [HI]), was found to explain 40% of the variance in reading. The HI uses caregiver education, caregiver occupation, gender, and marital status, to determine social status. In this model, SES had no significant predictive relationship. As for reading comprehension, Labov and Baker (2010), in their study of struggling readers, found that AAE children's use of dialectal features in their speech when reading orally had less of an effect on sentence comprehension than it did for children who spoke Latino English (LE) who had learned

to read in Spanish first. For instance, while both AAE and LE speakers might omit the final consonant when reading the past tense (e.g., "*opened*" pronounced as "*open*", p. 753), the LE speakers had more difficulty understanding the meaning of the remainder of the sentence. They argued that AAE speakers had knowledge of MAE, so even though they did not always speak MAE, they were able to comprehend a good deal of what they were reading. On the other hand, Hispanic speakers did not. This study suggests that dialect negatively affects reading, but the degree of effect on reading comprehension varies depending on the nonstandard dialect being spoken.

As it was for vocabulary, morphosyntactic differences may cause difficulties in mathematics. Terry, Hendrick, Evangelou, and Smith (2010) studied how students who speak AAE performed when they were required to solve MAE mathematical reasoning problems that contained a morphemic mismatch between MAE and AAE (e.g., present 3rd singular–s, as in "*Jill eats a lot of ice-cream*", [p. 2465], that may be articulated as "Jill eat a lot of ice-cream" in AAE). They found that the presence of such features negatively impacted the AAE-speaking student's ability to solve word problems in MAE. They suggested that this was due to the extra cognitive load required to codeswitch between the two dialects. Given the difficulty grammar differences cause speakers of AAE with literacy acquisition and with mathematics, it is reasonable to expect that speakers of other ethnic varieties, such as First Nations students, encounter similar difficulties.

Language Use

Students who speak a nonstandard variety may have different rules and expectations about the way language is used and the style of delivery that is appropriate. Misunderstandings between students and teachers can occur if differences are not known, impeding student success.

Questions. Differences in the cultural expectations concerning questioning may cause misunderstandings and resultant difficulties at school. Wolfram, Adger, and Detwyler (1993) suggest that direct questions may or may not be appropriate among students who speak Standard English as a Second Dialect, even though questioning is a commonly used teaching approach in schools (Cazden, 2001). Compared with White students, Philips (1983) reported that Indigenous students in Warm Springs Oregon were more likely to answer a teacher's questions when in a one-on-one situation with the teacher, than in the presence of other students in a group. Philips concluded that individual sessions with the teacher allowed students greater control over their learning and avoided the possibility of being seen as boastful or attention-seeking, characteristics viewed negatively in their culture. Neha (2003), a Navajo S-LP, reports that a Navajo speaker does not see the point of asking questions to which the answer is already known. Among Athabaskan people, asking a lot of questions is discouraged (Scollon & Scollon, 1981). Sharla Peltier, a S-LP and member of Rama (Mnjikaning) First Nation, Ontario, shared that questions are taken very seriously in her culture, and an answer is not given lightly; therefore, it may take a long time for a First Nations student to respond (Ball et al., 2007).

Silence. Silence, used as a form of respect (Ball et al., 2007), is reported as being a pragmatic language feature of many North American nonstandard Indian (Scollon & Scollon, 1981) and First Nations (Ball et al., 2007) dialects. Use of talking as a way of learning may be discouraged in lieu of listening, observing, and actively participating in activities (Ball & Lewis, 2005). Use of silence as a pragmatic dialectal feature may cause difficulties for students who use this feature. If a teacher is unaware of a student's use of silence, then the teacher might assume that the child has not understood or has nothing to say to contribute to the discussion. However, silence is not generalizable as a feature of all Indigenous nonstandard dialects nor expected in all circumstances. When interviewing First Nations parents and Elders, Ball and Lewis (2014) found that Elders preferred that children be both talkative and quiet. Many Elders expressed that children need to talk to learn, but also need to be quiet when Elders, teachers, adults, or visitors are talking or during ceremonies, prayers, or feasts. Flanigan (1987) suggests children are only silent when speaking with a White adult or authority figure. Anecdotal reports from other educational professionals and my personal observations indicate that silence is not always used among First Nations students in Northern BC, even with White authority figures. This variation in the use of silence among Aboriginal people points to the importance of verifying what local features are, before making generalizations.

Narrative. Michaels (1981) argued that many students who speak a nonstandard dialect prefer to tell a story in a topic-associating style (i.e., elements of the story are told in a non-linear way) rather that a topic-centred style (i.e., the story has a single plot, that is told in a linear fashion) in schools that promote the standard. Among certain American Indian speakers, stories may be reorganized, or particular elements might be altered for the sake of the audience (Leap, 1993). Scollon and Scollon (1981) suggest that Athabaskan speakers prefer stories to be brief.

Differences in the way students who speak nonstandard dialects tell stories at home, and the way they are expected to do so at school, may lead to some difficulties with their success in writing (Epstein & Xu, 2003). Students may have to learn new patterns of storytelling, providing yet another obstacle to overcome. Peltier's (2014) research confirmed that what is valued in story telling may differ between First Nations culture and SE school. In her study, she asked children of the Nipissing First Nation, Ontario, to tell stories using culturally appropriate storytelling methods (e.g., children told their stories while seated in a circle, a talking stone was used to remind children to listen respectfully and speak from the heart and so on). She scored the children's stories using western-oriented Narrative Scoring Scheme (NSS) of the Systematic Analysis of Language Transcripts (SALT, Miller & Chapman, 2008). She then asked Elders to rate the stories. She found some overlap in the assessment of what constituted a good story between the NSS and Elder ratings. However, she also found differences. For instance, Elders valued stories that encouraged the listener to think about how to interpret a story, or valued stories that had to do with family and community relationships. Other elements that appeared to be important to Elders included use of humour, attention-getting devices, vivid language to create an image in the listener's mind, use of an animated voice, expression of emotion, dialogue, and presence of a stated ending. The length of the story did not determine its value. Peltier discussed the need for western styled schools to become bicultural and teach story-telling styles of First Nations cultures, in addition to western ways of telling stories (Peltier, 2014).

Eye contact. Expectations regarding the use of eye contact may be different among Indigenous children. For instance, Philips (1983) noted that Native American children look away from the teacher more often than White children do and spend more time looking at each other. Participants in the First Nations Englishes forum also reported noticing that First Nations children may not make eye contact when listening to an authority figure as a form of respect. They were concerned that a non-First Nations person might mistakenly think that the child was not listening (Ball et al., 2007) if they were not aware of this pragmatic feature of their nonstandard dialect. Sharla Peltier reports that she first looks her communicative partner in the eye but then looks away to visualize what they are saying (Ball et al., 2007). Peltier has observed over-pathologization because of the difference in expectation regarding eye gaze. She reported that she has received referrals from medical professionals, who suspected a First Nations student had autism, because of the child's diminished eye contact.

Other differences in use and style. Wolfram et al. (1993, see pp. 20-32) list additional differences to consider when working with students who speak a nonstandard variety, such as: a) differences in intonation, b) whether small talk is required, c) differences in greetings, d) discourse openers and conversational closures, e) physical proximity, f) degree of directness, and g) rules for addressing the communicative partner. He also mentions pragmatic features such as turn taking, offering and accepting apologies, refusing, protesting, and directing as potential areas of confusion. If the student's conventions of language use in these areas are different from what is expected at school, misunderstandings can result.

Additional Factors that can Interfere with School Success

Educator's perspective. An educator's perspective toward their student's dialect may negatively affect the student's academic achievement in the classroom (Siegel, 2007). If teachers are unaware that their students are speaking a nonstandard dialect and do not adopt appropriate pedagogical practices, then they may negatively affect the student's learning. Maroney, Thomas, Lawrence, and Salcedo (as cited in Rickford & Rickford, 1995) found that children who were constantly being corrected for *errors* that were in fact *differences* related to their dialect became intimidated and participated less often in class. Epstein and Xu (2003) reported that some students also become resistant to learning to read and write. A student's speaking style may have other negative effects. Ford (1984) found that speaking style influenced how a teacher assessed a student's writing. For instance, Ford found that teachers evaluated written work associated with students who spoke Spanish-influenced English less favorably than those writing samples associated with Standard American speaking students, even though the writing samples had been previously evaluated as being equivalent by other teacher raters. Experience or teacher ethnicity had no effect on the results. The use of nonstandard variety can also influence a teacher's perception of a student's behavior. For example, Haig and Oliver (2003) found that teachers in low-income schools associated "their students' use of variants as indicative of poor language skills and this, in turn, with poor behaviour" (p. 275).

Assessment. Students who speak a nonstandard dialect may be at a disadvantage if they are assessed with tests standardized on students who speak the standard. They may be perceived as being less intelligent (Charity Hudley & Mallinson, 2011) or as having a language delay or disorder (Ball & Bernhardt, 2008). They may be

marginalized because of the misdiagnosis, and receive a lesser quality of education as a result (Hibel, Faircloth, & Farkas, 2008). The pathologization of Standard English as a Second Dialect students was another issue that came to the forefront in the Black English trial when S-LPs were found to be incorrectly diagnosing AAE speakers as having learning disabilities because they were assessing differences due to nonstandard dialect as errors (Baugh, 1995). Over-pathologization is also a concern for speakers of Native American Englishes. For instance, Bayles and Harris (1982) cited Nicholais and Joyner who reported very high percentages of Navajo children diagnosed as having language problems (up to 67%) and discussed the need for S-LPs to improve their ability to sort out the difference between dialect and disorder. Wolfram and Christian (1989) pointed out the potential bias of standardized reading tests, arguing that students who speak nonstandard varieties may obtain lower scores because of differences in pronunciation, grammar, and vocabulary. Rickford and Rickford (1995) discussed the work linguists have carried out to expose the cultural bias in IQ tests. Pearce and Williams (2013) found evidence of cultural bias in the Clinical Evaluation of Language Fundamentals - Fourth Edition (CELF-4, Australian Edition, Semel, Wiig, & Secord, 2006b), a test widely used by S-LPs to assess school-aged children. I have observed a well-meaning clinician, unaware of local dialectal features, initially assign a lower score to a child on the Formulated Sentences subtest of the CELF-4 (Semel, Wiig, & Secord, 2006a) than perhaps was warranted. In this particular task, the child is instructed to create sentences about pictures with target words. Sentences that are complete and grammatically correct earn more points than those with grammatical "errors". Once the clinician became aware that she may have been penalizing children for grammatical dialectal differences, and that the effects may have been cumulative according to the scoring procedures of the CELF-4, she supplemented standardized assessment tools with child-centred approaches to assessment.

Research regarding the potential negative consequences of using tests not standardized on children who speak Native American Englishes comes from Hibel et al. (2008). They investigated the reported over-placement of American Indian/Alaskan Native (AI/AN) students in special education classes relative to non-ethnic and other ethnic students. They reported that AI/AN children were twice as likely to be placed in special education classes in Grade 3 than non-Hispanic white children. However, performing multi-level regression analysis, and controlling for other factors such as SES, behavioral readiness, gender, and tests scores on standardized tests of kindergarten readiness in literacy and numeracy, showed that AI/AN children were no more likely to be placed in special education classes than non-Hispanic white children. For AI/AN children, as it was for all the minority children included in the study, a significant predictive factor of Grade 3 special education placement was kindergarten readiness test scores in reading and math. While at first it may appear as though the Native children's lack of school readiness upon school entry leads to placement in Special Education in Grade 3, there may be other explanations. It may be that children's abilities are being underestimated by their lower scores on tests that Hibel et al. say are culturally biased. As Siegel (2010) discussed, underestimation becomes a self-fulfilling prophecy. Alternatively, it may mean that students cannot keep pace with their SE peers because they enter school speaking a different variety of English, and this difference, rather than learning ability, is what is being measured by SE tests of school readiness.

ASHA (1983) and SAC (1997) have advised against using tests that have been standardized for use with SE speaking students when assessing nonstandard dialect speakers. To overcome cultural bias, researchers and scholars recommend the use of language sampling as an authentic way to assess language (Heilmann, Nockerts, & Miller, 2010; Pearson, Jackson, & Wu, 2014). Wolfram et al. (1993) suggest modifying tests, taking the features of the nonstandard dialect into consideration. Eriks-Brophy (2014) and Wolfram et al. (1993), however, remind clinicians that changing test protocols invalidates norms. Eriks-Brophy suggests combining standardized assessment with other types of assessment, such as child centred approaches that take into consideration the child's language in different contexts and culture. Bayles and Harris (1982) give suggestions as to how to create community norms. Dynamic Assessment is also recommended (Kramer, Mallett, Schneider, & Hayward, 2009; Laing & Kamhi, 2003). It uses a test/treatment/retest model and an assessment of rapidity of response to intervention, to distinguish error versus difference. The Diagnostic Evaluation of Language Variation (DELV, Seymour, Roeper, & de Villiers, 2003), a test designed to sort out language disorder versus difference, is standardized with American speakers of mainstream and non-mainstream varieties of English. Therefore, it is not known if can be used with Canadian speakers.

Inability to hear the difference between the standard and the variety. Siegel (2010) suggests that the inability to discriminate the difference between the home language and standard language is another obstacle to learning in school. For instance, Geiger and Greenberg (1976) found this to be the case for children who spoke AAE in inner

city schools in Washington, D.C. Students who had been trained to discriminate informal AAE from formal SE using pairs of sentences that differed lexically, were not able to discriminate when sentences differed syntactically. Older children (e.g., 10-year-olds) performed better than younger children (e.g., 6-year-olds) and some syntactic forms were discriminated more easily than others (i.e., children were better able to discriminate between forms of the copula but less able to discriminate the possessive). Nevertheless, this study supports the notion that children who speak the nonstandard dialect may have difficulty discriminating the vernacular from the standard. This might also explain why a technique known as contrastive analysis, whereby the teacher systematically teaches the points of contrast between the home variety and the standard, is so effective (Wheeler & Swords, 2004). Similarly, this could explain the effectiveness of teaching codeswitching, whereby children are taught when to use what variety of language (Devereaux, 2014). I have also observed that children in northern BC may have difficulty discriminating the difference between the community variety of English from formal SE unless the differences are explicitly pointed out.

Summary and a Call for Engagement

There is a body of evidence that supports the position that the academic achievement of students who speak a nonstandard language variety is lower than it is for those who speak the standard (e.g., Biddle, 2011; BC MoEd, 2015), and that their use of nonstandard variety is a contributing factor to their lower achievement (e.g., Labov, 2003; Rickford, Sweetland, & Rickford, 2004). Differences in pronunciation (Labov, 2003), grammar (Siegel, 2010), and vocabulary (Charity Hudley & Mallinson, 2011) can affect literacy development, and learning in math and science (Terry, Hendrick, et al., 2010). Differences in use of language can lead to misunderstandings and resultant changes in teacher perspectives about students (Rickford et al., 2004; Siegel, 2010). The use of inappropriate assessment tools can result in unnecessary pathologization and inappropriate pedagogical approaches (ASHA, 1983; Baugh, 1995; Laing, & Kamhi, 2003; SAC, 1997).

Children who speak a nonstandard language variety are at a disadvantage in classrooms that favour the standard language of the dominant culture. It is reasonable to assume that issues that prevent success in classrooms for other speakers of ethnic varieties also affect many First Nations students in Canada in similar ways. It is likely that their nonstandard dialect is a contributing factor to their lack of school success, a situation many Aboriginal communities desire to change (Assembly of First Nations, 2015).

As has been recommended in the literature, reform is needed in many areas (Ball et al., 2007). Scholars argue that First Nations English dialects must be accepted as a legitimate rule-governed variety (Sterzuk, 2011); to hold the standard as "correct", and other varieties as "incorrect" is a form of colonial assimilationism and linguistic discrimination (Lippi-Green, 1997; Sterzuk, 2011). This stance has led some S-LPs to consider whether we should revise our objective of standard English proficiency as a key to success in school and in life (Campbell, 2011). Others argue for a bidialectal approach, whereby classrooms legitimate the value of both the community dialect and the standard, by teaching children to communicate in both dialects (Malcolm, 1995), using effective yet culturally sensitive approaches such as contrastive analysis and codeswitching (Sterzuk, 2011; Wheeler & Swords, 2004). If successful, this approach would ensure that dialect-speaking children have a "firm foot in both worlds", a wish that has been expressed to me by community members and Elders. While I believe that both perspectives are valid, I also believe the decision is not mine to make. If I made that decision without consulting the community, then I would be perpetuating a colonial perspective, which presumes that "I know what is best" for dialect-speaking communities. Rather I see my role as someone who should present all perspectives that are based on current knowledge, which unfortunately is limited. Community members, not scholars nor teachers nor S-LPs, need to have an opportunity to debate the issue and decide.

Whether a community decides to argue for acceptance of their dialect in schools as a legitimate form of English, or adopt a bidialectal approach, we need to learn more about nonstandard dialects and improve our pedagogical and clinical practice. We need to raise educator awareness, develop culturally appropriate assessment tools and procedures, and reexamine curriculum and government policy (Ball et al., 2007; Eriks-Brophy, 2014). However, before any of these areas can be adequately addressed, it is crucial that we first determine the dialectal features: what they are, where they are variable, and what the rules or constraints on use are. At the moment, we are severely limited in our knowledge. For instance, are we certain vocabulary differences always exist in comparison to other non-First Nation students? If First Nations communities want their children to be proficient in the standard, we need to know if vocabulary is an area that needs targeting. If First Nations communities would rather have their students' dialect be accepted in the classroom, then we still need to know more about their lexicon, so we can determine which children are developing vocabulary according to community standards,

and which children are in need of specialized help. As for our knowledge of phonological and grammatical features, at the moment we must be guided by very limited empirical data and informal observations (Ball & Bernhardt, 2008). In BC, the Ministry of Education will provide funding to schools that have students designated as ESD so that students can be given additional help to become proficient in the standard (BC MoEd, 2016). How can we designate a student if we do not know what the community dialectal features are? In our assessments, how can we sort out disorder from difference if we cannot identify the differences? How can we avoid misunderstandings with students if we are not aware of the different ways language is used in their community? Additionally, if one of our objectives is to improve pedagogical practice in helping children achieve proficiency in SE, we need to learn more about how students acquire the standard in classroom settings. The research that I have been able to find on second dialect acquisition required knowledge of dialectal features (see, for instance, Isaacs, 1996; Charity et al., 2004; Craig & Washington, 2004; Craig et al., 2009; Terry et al., 2012). If another equally important objective is to support the nonstandard variant, then we must learn what dialectal features are in need of support. Currently, there is a paucity of research on First Nations Englishes in Canada (Ball & Bernhardt, 2008) and much of the research may be outdated (Eriks-Brophy, 2014). Research is crucial if we want to improve our practice. For instance, in his longitudinal study, Isaacs (1996) found that use of dialectal features among AAE-speakers declined over grades, but certain features persisted at high rates, even after exposure to SE (e.g., in Grade 3, 91% of speakers used copula deletion; by Grade 7, 74% of speakers were still deleting the copula). If a teacher was aware of which features are likely to persist, and the community desired that their children become proficient in the standard, then the teacher might decide that students needed additional instruction for these specific features. Again, we cannot use these techniques if we do not know what to contrast and what features to switch.

As Cazden (2001) suggested, we can and should become ethnographers. I give this suggestion only after careful consideration because I am aware of the time and commitment required to conduct research that is meaningful and respectful of Aboriginal culture and community. Cazden agrees that it is unlikely that teachers have the resources to conduct intensive ethnography. However, if each one of us who are experienced in working with First Nations students *obtained community permission* to study and share our observations about the differences in the way English is understood, spoken, and used in our communities, then we would begin to create a pool of data for use when assessing and teaching children. Resources exist to guide us. Wolfram et al. (1993) published a manual that laid out steps for S-LPs in Baltimore to follow when documenting AAE. Their manual could be used when documenting First Nations English. Cazden also includes suggestions for teachers, including inviting students to collect data on the local ways of talking and conventions of language use. We should use these resources in collaboration with community members and researchers in post-secondary settings, to ensure we conduct our investigations using culturally sensitive research methodologies. We may not have Indigenous ancestry, but we can be *Indigenists* and take steps to improve our practice with First Nations students. "Speech and language pathologists [and educators] seem to have an unprecedented socio-educational opportunity, if not an incumbent moral obligation" "to acquire, apply, and disseminate reliable information and valid perspectives about language variation throughout society" (Wolfram et al., 1993, p. 108).

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