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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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			Total
	Gender		
	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, $p = .015$.
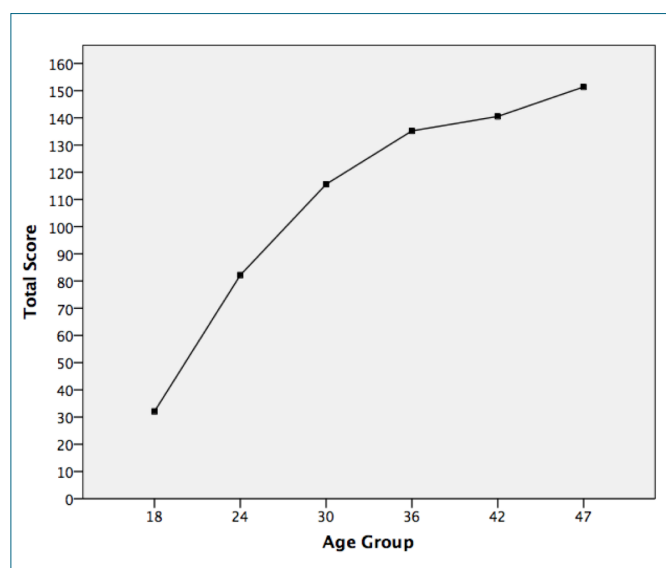
Figure 1. LUI-French Total Score by Age Group

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. $t(29) = .717$, $p = .479$.
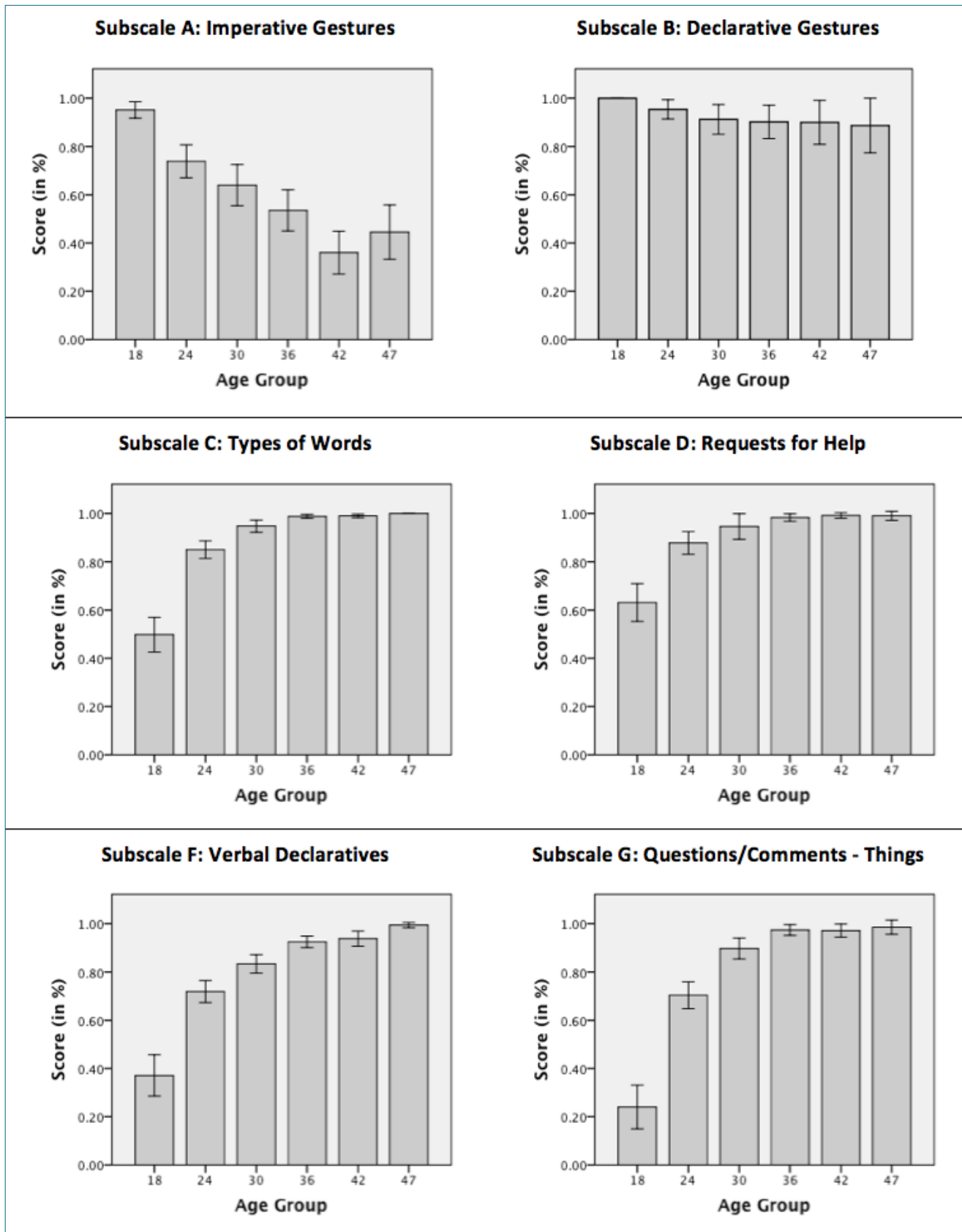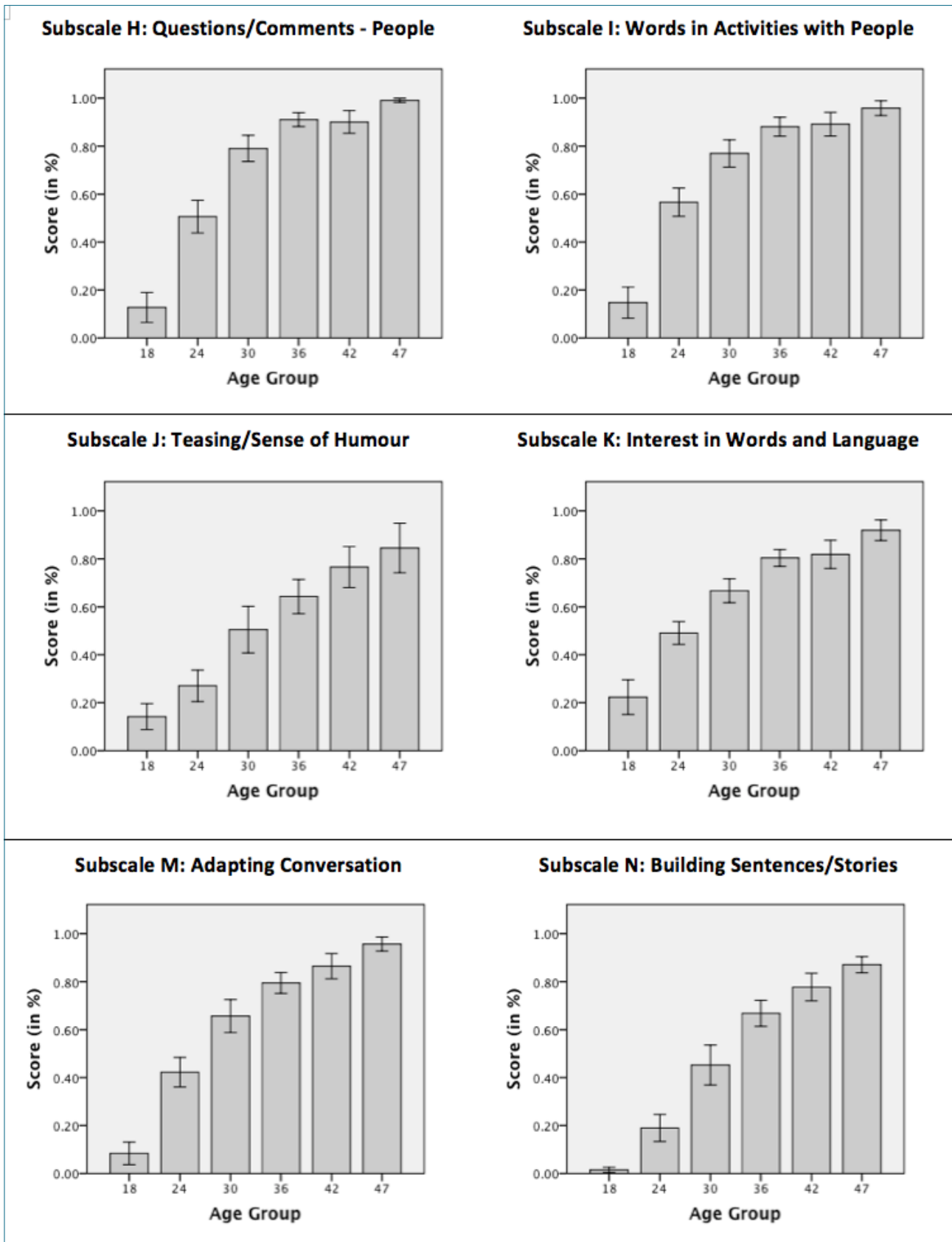
Figure 2. LUI-French subscale scores (expressed as percent) by age group (in months). The full names of the subscales are provided in Appendix A and also in Table 2. Error bars 95% CI

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.
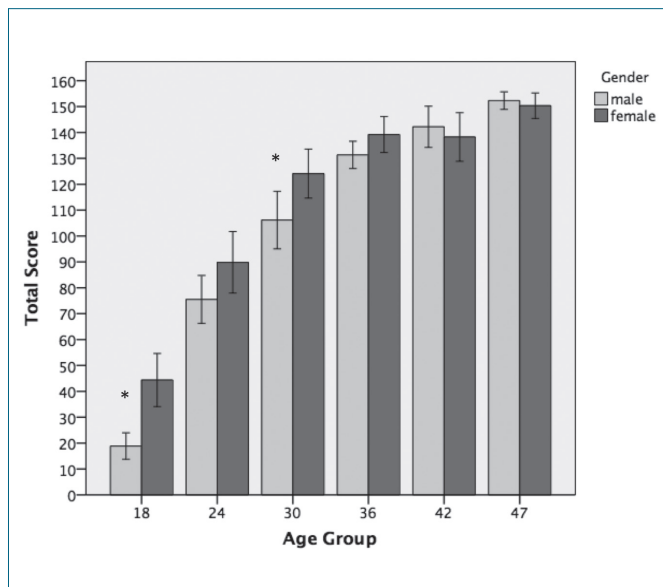

Figure 3. LUI-French Total Score by Age Group and Gender. Error bars 95% CI.
*p < .002. See text for remaining comparisons

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)	