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Assessment of English Language Learners: Using Parent Report on First Language Development

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Abstract

Purpose: Obtaining information on both languages of English language learners for assessment can be a challenge in a multilingual context. It is often difficult or impossible to observe a child's first language directly due to the absence of resources available in every language spoken. The objectives of this study were (1) to develop a parent questionnaire on the first language development of English language learners that is not specific to a particular language/cultural group: the Alberta Language and Development Questionnaire (ALDeQ), and (2) to test how well scores on the ALDeQ differentiated between English language learners with typical development and those with language impairment.

Method: Participants were 139 typically-developing children and 29 children with language impairment, aged 69 months with 18 months of exposure to English through preschool or school, on average. The ALDeQ consists of four sections: early milestones, current first language abilities, behaviour patterns and activity preferences, and family history. ALDeQ total scores are proportions calculated across all sections.

Results: T-test analyses revealed robust between-group differences for ALDeQ total scores, and for each section score, with medium to very large effect sizes. Linear discriminant function analysis showed the ALDeQ total scores to be a significant and moderate discriminator between the typically-developing and language impaired group, but with better specificity than sensitivity. The early milestones section scores emerged as the strongest discriminator among the four section scores. Parent responses showed that both the typically-developing and language-impaired groups included children

experiencing first language loss, but nevertheless, the current first language abilities section was the second strongest between-group discriminator.

Conclusion: The ALDeQ would be useful to speech-language pathologists for obtaining information on English language learners' first language development, in particular where the first language cannot be examined directly. The information provided by the ALDeQ could be used in conjunction with other measures in order to identify children with language impairment among English language learners. The complete ALDeQ and score interpretation information are given in the appendix.

Assessment of English Language Learners: Using Parent Report on First Language Development

1. Introduction

Children who speak the majority language, English, as their second or third language (English Language learners: ELLs)[1] are found in the caseloads of speech-language pathologists in Canada, the United States, Australia, the United Kingdom and elsewhere. In the Canadian context, the number of ELLs has been increasing since 2001 and currently12.5 % of all children between the ages of 0-9 speak a language other than English or French at home, with numbers reaching 18-26% in the large urban centres of Toronto, Vancouver, Edmonton and Calgary (http://www.statcan.gc.ca). Accurate identification of language and learning disabilities in the ELL population is a challenge because of the lack of appropriate assessment tools and protocols designed specifically for this population. Furthermore, research examining the linguistic characteristics of ELLs in the early stages of English acquisition has found striking parallels between this group of typically-developing children and monolingual English-speaking children with language impairment (LI) (Paradis, 2005; Paradis, 2008; Paradis, Rice, Crago & Marquis, 2008). ELLs have incomplete English language skills like their monolingual peers with LI, but for different reasons; however, mistaken referral of typically-developing ELLs for speech-language therapy and special education services is a well-known problem (Cummins, 1984, 2000; Donovan & Cross, 2002; Genesee, Paradis & Crago, 2004;

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[1] Abbreviations used in this article: ELL (English language learners), L2 (second language), L1 (first language), TD (typically-developing), LI (language impairment), ASHA (American Speech and Hearing Association), CASLPA (Canadian Association of Speech-Language Pathologists and Audiologists), ALDeQ (Alberta Language and Development Questionnaire).

Gutiérrez-Clellen, 1996; Gutiérrez-Clellen, Restrepo & Simon-Cereijido, 2006; Klingner & Artiles, 2003).

Obtaining information on the first language (L1) development of ELL children is highly relevant to assessment, since children would not present with a developmental language disorder in one language but not the other, and information on both languages provides a more complete picture of a bilingual's linguistic abilities, especially if the L1 is the more proficient language and/or the L2 development is in the early stages. Accordingly, assessment of bilingual children using information from both languages is recommended by the American Speech and Hearing Association (ASHA, 1985, 2004), and the Canadian Association of Speech-Language Pathologists and Audiologists (CASLPA, 1997). Uncritical use of translated tests is not recommended, but ASHA suggests it could be acceptable with the interpretation assistance of a trained linguistic or cultural broker (ASHA, 2004). Even when administered with the assistance of a broker, translated tests are problematic because they may not be targeting key clinical linguistic markers in the L1, as markers vary crosslinguistically (Crago, Paradis & Menn, 2004; Gutiérrez-Clellen, 1996; Leonard, 2000), they may not be fully culturally-adapted (Anderson, 1996; Eng & O'Connor, 2000; Restrepo & Silverman, 2001), and norm- or criterion- referencing would not be possible anyway. In contrast, researchers have found that non-standardized measures such as parent and teacher questionnaires on L1 use and development, and L1 spontaneous language samples analysed for target structures, can be valid assessment tools (Gutiérrez-Clellen et al., 2006; Restrepo, 1998; Restrepo & Kruth, 2000). Use of these methods is also endorsed through the ASHA and CASLPA position papers.

Even though understanding L1 abilities and developmental history would be highly relevant in the assessment of ELL children, it is necessary to consider what kinds of factors could make the contribution of L1 information limited or non-existent in an assessment context: (1) the speech-language pathologist is not fluently bilingual in both English and the child's L1, (2) trained interpreters and/or cultural brokers from the child's background cannot be found in the area, (3) very little documentation exists on the typical and atypical course of development of that language, and (4) the child's current L1 abilities may be weaker than those of monolingual children in the home country because he/she may be experiencing L1 attrition (see 1.3). The diversity of minority languages spoken by ELL children underlies most of these limiting factors. Canadian children aged 0-9 whose mother tongue is neither English nor French number 432,655, and speak 100 or more different languages (http://www.statcan.ca). Among this group of children, the most highly represented L1s are the Chinese languages, yet children whose L1 is a Chinese language comprise just 20% of the total of ELLs. Therefore, the Canadian context has true diversity of L1 backgrounds among ELL children, in contrast to the United States where approximately 79% of ELL children this age have Spanish as their L1 (Goldstein, 2004).

Because of the diversity of L1s, direct examination of the L1 is less likely to be a practical option in Canada and other diverse contexts. However, parental report on L1 development might be a possible option as long as interpretation or cultural brokering services are available when the parents do not speak much English. Therefore, it is important to consider whether parent report on children's language development is valid

in general, and whether the potential for L1 attrition would render L1 development information on ELLs more confounding than helpful.

1.2 Parent report on children's language development

A widely-used parent report instrument is the MacArthur-Bates Communicative Development Inventories (CDI), a checklist of early vocabulary and grammatical constructions for infants and toddlers (Fenson, Dale, Reznick, Bates, Thal & Pethick 1994). For language production in toddlers, parents indicate on a form which words and constructions their child says from a given list of single words and comparative constructions, and also write down their child's longest utterances. Researchers have compared parents' CDI information with direct observations of children's language production, and the parallels between parent data and observation measures have shown this parent report instrument to be valid (Dale, 1991; Thal, O'Hanlon, Clemmons & Fralin, 1999; Marchman, Martínez-Sussmann & Dale, 2004). In particular, Thal et al. (1999) found the CDI data to be valid for children with language impairment, and Marchman et al. (2004) found the CDI data in both Spanish and English to show the same patterns for lexical-grammatical relationships as laboratory data for bilingual children. Lee, Chiu, Hasselt & Tong (2009) compared results of a parental vocabulary checklist to scores from a standardized receptive vocabulary test in Cantonese-speaking children with hearing impairment in Hong Kong. Similar to the CDI studies, these researchers also found parent report to be accurate, and furthermore, factors such as mother's education level or occupation did not influence accuracy in reporting. In sum, this research suggests that parents' report of their children's language development appears to be reliable for monolinguals or bilinguals, for children with typical or atypical development,

and across cultures/languages. Therefore, parents' report of their children's L1 abilities has the potential to be a valid measure that could be useful for the assessment of ELL children.

The research discussed above was based on parent report of children's current language abilities, rather than retrospective report on earlier stages. It is possible that parents might not recall their children's past developmental stages as well as they can identify current abilities; however, for older preschool and school-age children who are being assessed for the presence of language impairment, retrospective information on the timing of early milestones would be important to obtain. It is difficult to conduct validity studies on retrospective report because observations of the relevant period must be already made before parents' retrospective report data are gathered. Gilger (1992) conducted a study on the validity of retrospective parent report of academic achievements. In this research, parents' retrospective report was gathered on their own academic achievements, and on the past and present academic achievements of their children. Report results were then compared to state records of academic achievement tests for parents and children. Gilger (1992) found the parents' report of their own and their off-spring's academic achievements correlated significantly and moderately with state records. Furthermore, age of the offspring (distance in time from when they were in school) did not affect parents' accuracy in reporting. The study by Gilger indicates that retrospective parent report can be reliable, and accordingly, the questionnaire used in this study includes a section asking parents to give the ages at which their child met early language development milestones.

Restrepo (1998) used parent questionnaire data, along with data based on direct observation of children's language abilities, to investigate the best discriminators of children affected with LI among a group of Spanish-speaking children in the United States. She found that parent report of the child having speech and language problems, as well as their report of family history, proved to be good discriminators, along with certain direct measures of the child's Spanish. The questions given to parents included the following topics: the child's current Spanish abilities, behaviours potentially associated with the presence of LI or possibly co-morbid disorders, and family history of speech, language, learning or literacy problems. There were no retrospective questions on the child's early Spanish development. There was also no provision made for understanding how well the child was maintaining Spanish in an English majority context, but this was most likely because all the children were predominantly Spanish-speaking at the time of testing and attending school in Spanish. Furthermore, Restrepo (1998) provided very limited scoring and interpretation information even though the complete questionnaire is given. Restrepo (1998)'s results formed the impetus for the present study; however, as described in 2.3, there are several differences between her questionnaire and the one in this study. Also, an additional goal of this study was to provide detailed scoring and interpretation information so that the questionnaire could be used in a clinical setting.

1.3 First language attrition

Because ELL children are bilingual, on average, they do not hear and use each of their languages as often as monolingual peers who speak each language. Moreover, when the L1 is a minority language, opportunities to hear and use this language once children start English preschool or school would be diminished. If the L1 is not supported through

schooling, children would not be exposed to vocabulary and syntactic constructions that are more frequent in written and formal language than in oral and informal language, and thus, would have different experiences in their L1 compared to their age peers who speak the L1 in the country of origin. Minority L1 children eventually become dominant in the L2, although how long this process takes varies considerably, with size of the L1 speaking community and age of onset of English appearing to be determining factors (Kohnert & Bates, 2002; Jia & Aaronson, 2003; Jia, Aaronson & Wu, 2002; Mägiste, 1992; Montrul, 2008; Pease-Alvarez, Hakuta & Bayley, 1996; Wong Fillmore, 1991; Winsler, Díaz, Espinosa and Rodríguez, 1999).

Some minority children could shift their language use entirely to the L2, resulting in complete or near complete loss of the L1 (Montrul, 2008). Even if the L1 is maintained, there are often differences between the variety of the L1 minority children speak and the variety spoken by children in the country of origin; such differences being the result of L1 attrition (Anderson, 2004; Montrul, 2008). L1 attrition refers to erosion of L1 lexical and grammatical features, or more generally, to stagnation in the growth of the L1. Features of attrition in Spanish-speaking children in the United States can include the following: use of demonstrative phrases like *éste* 'this one' and *eso/esa* 'that one', or code-mixing, when a child cannot recall a word, gender agreement errors in noun phrases, use of the third person singular form of the verb as a default, or inappropriate choice of perfect versus imperfect verb morphology (Anderson, 2004). Montrul (2008) argues that some minority L1 differences are better characterized as incomplete acquisition rather than attrition. Incomplete acquisition refers to lexical and grammatical structures for which L1 minority children have not received sufficient input to acquire. If

the dominant language shifts at an early age to the L2, and/or if the child has no formal literacy training in the L1, they may never completely acquire some aspects of the language, for example the subjunctive mood in Spanish. Thus, incomplete acquisition contrasts with attrition because attrition assumes an individual has acquired a structure fully and has lost it, or partially lost it, afterwards. Because this study is not focused on differentiating between incomplete acquisition and attrition, the term "attrition" will be used for the sake of simplicity.

The phenomenon of L1 attrition is important to the present study because current L1 abilities of minority children could be judged as poor by their parents not because they have a developmental language disorder, but because the characteristics of attrition are present in their use of the L1. Anderson (2004) discusses how L1 attrition characteristics pose complications for the bilingual assessment of ELL children, including over-identification. These complications would apply if the L1 were examined directly or if parental report were being used. Accordingly, we have taken the issue of L1 attrition into account in the formulation and selection of questions on the questionnaire, and in the analyses conducted.

1.4 The present study

The goal of the present study was to develop a non-language/culture specific parent questionnaire and determine how well these questionnaire data could differentiate between TD ELL children and ELL children with LI. In so doing, this study could determine the questionnaire's usefulness as an instrument that could be included in an assessment battery in contexts where direct measures of L1 development are not possible

to obtain. The specific research questions for this study were: (1) Can parent questionnaire data on L1 development differentiate children with LI from TD children among ELLs? (2) Can retrospective parent information differentiate between these groups? (3) Can parent information on current L1 abilities differentiate between these groups given the potential complications of L1 attrition?

2. Method

2.1 Participants

One hundred and sixty-eight children participated in this study. Children were recruited from schools, and through agencies that assist newcomer families (i.e., immigrant and refugee families) in Edmonton and Toronto, Canada; the majority of the children were residing in Edmonton. There were 139 children in the typically-developing (TD) group, with a mean age of 69 months (s.d. = 7 months, range = 58-81 months) and 29 children in the language-impaired (LI) group, with a mean age of 70 months (s.d. = 12 months, range = 58-109 months). There was no significant difference between the mean ages of these two groups.

All the children were ELLs. Forty-five percent (75/168) of the children were foreign-born, and all of the children had foreign-born parents. Some of the children were exposed to English, as well as to the minority language, at home at the time of testing, but as a qualification for inclusion in the study they had to have been exposed to limited English at home before entry into a daycare, preschool or school program after the age of 2 to 3 years. This inclusion qualification was designed to exclude true simultaneous bilinguals from the study (cf. Genesee, Paradis & Crago, 2004). Although the vast

majority of children were exposed to English around 4 years of age or older (see Table 1), a small number of children in the sample began learning English outside the home closer to 2 years of age. At the time of testing, all children were enrolled in elementary schools, but children's age of onset of exposure to English, and total months of English exposure varied. The data in Table 1 reveal that the LI group were, on average, younger at the onset of English exposure (means of 44 vs. 53 months) and had experienced more English exposure than the TD group (means of 26 vs. 17 months). This outcome largely reflects the practices of speech-language pathologists in the Edmonton area where there is some hesitation to identify ELL children as LI before they have had two years of exposure to English. This difference in length of exposure to English would be expected to influence the children's English abilities. While the children's English abilities are not the focus of this study, it is still a factor that needs to be taken into account because, as mentioned in 1.3, some researchers have found that earlier/longer exposure to the majority L2 could hasten L1 attrition in minority children (e.g., Montrul, 2008; Wong Fillmore, 1991). Accordingly, the potential impact of this exposure difference on the questionnaire results was examined.

Children's L1 backgrounds fell into the following typologically-related groups, representing common L1s for children in this age range in Canada: (1) Cantonese or Mandarin (Chinese), (2) Farsi, Hindi, Punjabi or Urdu (South Asian), (3) Arabic, and (4) Spanish or Portuguese (Romance). Eight of the 29 children with LI had different L1s: Somali, Vietnamese and Assyrian. There is no reason to believe that differences in the typological characteristics of the L1 would influence parents' responses on the questionnaire, but differences according to culture might. While we had no specific

hypotheses to test in this regard, analyses were conducted to understand if questionnaire scores varied according to linguistic/cultural group.

Children in the study tended to be later-born rather than first-born, but mean birth order did not differ between the TD and LI groups (see Table 1). In spite of no between-group differences for mean age or birth order, children's ages and birth orders varied across groups. It is possible that when children are older, and/or later-born, parents' retrospective report of early milestones might be less accurate. This possibility was taken into account in the analyses.

INSERT TABLE 1 ABOUT HERE

2.2 Inclusionary/exclusionary criteria for children with LI

The children with LI were recruited for the study in two ways. First, some were recruited directly from the caseloads of speech-language pathologists working in schools or at Head Start programs, and thus, were or had been receiving individual therapy. Second, some were recruited from special kindergarten programs for children with language or cognitive delays in the Edmonton Public School Board, and for children with language delays in the Toronto Catholic District School Board. These programs have speech-language pathologists among the staff who work with the children, and children undergo assessment in order to qualify for placement.

Regardless of location of recruitment, we requested referrals for ELL children who displayed primary language delay/impairment, but who did not have hearing impairment, autism spectrum disorder, acquired neurological damage or clinically-significant

cognitive limitations, e.g., Down Syndrome. Children with primary speech, rather than language, difficulties were excluded as well. To qualify for speech-language pathology services and/or the special programs mentioned above, children had to have scores on a standardized test battery lower than the normal range. Individual test batteries and determination of qualifying scores for services/placement differed between speech-language pathologists and programs, but in most cases, qualifying scores were lower than the -1.5 standard deviation cut off employed in much research on children with LI. We did not have access to children's actual test scores, and thus, cannot present this information. For the majority of the children (N=19), the speech-language pathologists indicated to us that there was some parent concern about their child's L1 development; however, this information was not gathered in a systematic way. There were just two children whose L1 development was examined directly by a community health worker who spoke that language, but this examination was informal. Therefore, all children's assessments were based on direct and systematically gathered information on their English abilities, and about two-thirds of the children's assessments included informal inquires into L1 development. This imbalance in information gathered between the L1 and the L2 is symptomatic of assessment in the diverse Canadian context.

Four of the children with LI had non-verbal IQs between 75 and 85, as measured with the Columbia Mental Maturity Scales (Burgemeister, Hollander Blum & Lorge, 1972). Accordingly, this group of children is not referred to as having *specific* language impairment, although, the majority of them did have non-verbal IQs > 85. The mean non-verbal IQ of the children with LI is within the normal limits, but still significantly lower than the mean for the TD group (see Table 1), which is a common occurrence even

in samples of children with specific language impairment (Leonard, 1998; Swisher, Plante & Lowell, 1994).

2.3 Materials

The Alberta Language Development Questionnaire (ALDeQ) was developed for this study, and the complete questionnaire is given in the appendix. Many questions in the ALDeQ were based on those from the questionnaire presented in Restrepo (1998), but nevertheless, the ALDeQ has several key differences with Restrepo's questionnaire. First, there are no questions asking about the ability to produce particular target structures in a language because the ALDeQ was designed to be non-L1 specific. Second, responses are scored using rating scales instead of a binary yes/no system because it was thought that parents could express more nuanced information this way. Third, there is a retrospective section on the development of early milestones. The ALDeQ was developed in consultation with the Multicultural Health Brokers Cooperative (http://www.mchb.org), which is a registered worker cooperative serving immigrant and refugee communities in Edmonton, Canada. One component of their work is connecting newcomer families to health resources regarding early childhood development and providing culturally- and linguistically-interpreted information about child health and services to these families. The ALDeQ consists of four sections covering the following topics: early milestones, current L1 abilities, behaviour patterns and activity preferences, and family history.

Section A: Early milestones. Children affected with LI are usually delayed in reaching early milestones such as producing a first word, using word combinations/sentences, and

possibly, starting to walk unassisted (Leonard, 1998, Trauner, Wulfeck, Tallal & Hesselink, 2000). Accordingly, questions 1-4 were aimed at obtaining information on the timing of these milestones. Because there are only 4 questions in this section, but the answers to these questions are very important to determining if a child's L1 development has proceeded according to the typical pattern, questions 2 and 3 concerning first words and sentences are assigned 6 points, instead of 3 points, each. Thus, information in section A is equally weighted with information in section B.

Section B: Current L1 abilities. Children affected with LI in the late-preschool and early school age years have below age-expected abilities in their oral language, by definition. As mentioned in 1.0 and 1.3, in the case of ELL children, information about their abilities in both languages is crucial to a well-rounded view of their linguistic development; however, minority L1 children might not have age-expected abilities in the L2 due to not having had enough time to acquire it, and also may not have age-expected abilities in the L1 due to attrition. Since the ALDeQ is concerned with L1 abilities, the issue of attrition was important for developing section B. Questions in section B ask parents to report on how their child's language abilities compare with other children from the same L1 background who are also ELLs, in order to select a realistic comparison group. Parents are also asked about their level of satisfaction with how their child expresses him/herself, and whether he or she speaks like children in the home country and if not, why this might be. Parents can be directly asked whether they believe their child is losing their L1 in favour of English (question 10b). Therefore, section B is aimed at obtaining information about current L1 abilities in a multilingual context, taking into account that these abilities may be weak for reasons other than developmental language disorder.

Section B includes questions about the expressive rather than the comprehension abilities of the children. In earlier versions of the questionnaire that we piloted, comprehension questions were included, but they were removed from the final version because they did not seem to be effective. For example, feedback from the cultural brokers and research assistants indicated comprehension–based questions were sometimes difficult to explain to parents, and the parent responses of both TD and LI children were uniform and indicative of no problems, which might have been reflective of the difficulty in parents understanding the questions. Using a questionnaire format, it is challenging to find a way of asking parents of children this age to gauge comprehension abilities. This is because even children with LI this age have developed comprehension abilities to some degree of complexity. Therefore, the ALDeQ focuses more on expressive skills, although parents could be taking comprehension skills into account in their response to question 7.

Section C: Behaviour patterns and activity preferences. Even though the primary area of difficulty for children with LI is language, they often have mild deficits in some cognitive and perceptual abilities (Leonard, 1998; Kohnert & Windsor, 2004; Swisher, Plante & Lowell, 1994). Researchers have also documented the presence of non-clinically-significant reading and attention deficits in children with LI, or co-morbidity between LI and reading impairments like dyslexia and poor comprehending, and between LI and Attention Deficit and Hyperactivity Disorder (Botting, Simkin & Conti-Ramsden, 2006; Catts, Adolf, Hogan & Ellis Wesimer, 2005; Cohen, Vallance, Barwick, Im, Menna, Horodezky & Isaacson, 2000; Finneran, Francis & Leonard, 2009). Whether there is a common underlying cognitive-perceptual cause for the overlap between LI and

difficulties in these other areas is still a matter of debate; however, the presence of behaviours possibly signaling cognitive delay, reading or attention problems might be useful in the identification of LI. Accordingly, the questions in section C cover a range of topics about the child's behaviours and activity preferences with the aim of uncovering the presence of any cognitive, reading, or attentional difficulties, and the child's potential frustration with his/her communication abilities (question 16). Restrepo (1998) also included a number of questions designed to obtain similar information; however, the questions on the ALDeQ tend to be more indirect than Restrepo (1998)'s questions. For example, Restrepo's questionnaire asks parents directly if their child is dyslexic or hyperactive (Restrepo, 1998, p. 1410). Our consultations with the members of the Multicultural Health Brokers Cooperative led us to formulate more indirect questions on the grounds that parents from some cultures might not be familiar with developmental disorders, and/or have a culturally-based dispreference for revealing such information about their child directly.

It is important to point out that the questions involving preference or dispreference for literacy activities might be irrelevant for some children because there would have been no opportunity for them to be engaged in such activities. Is it possible that including these questions could make the results biased against TD ELL children who have not had much experience with literacy? First, one of the features of the ALDeQ is that questions can be omitted, and their points removed from both the numerator and denominator of score calculations (see appendix and 2.4 below). Asking parents about whether their child has had literacy experiences before deciding to include the questions related to this in the total would be prudent (cf. instructions for question 12 in the appendix). Second, the

ALDeQ includes just 2 questions directly related to reading, and "perfect" scores for TD children are not expected in any case. Thus, if low scores due to lack of opportunity for these 2 questions were included in the total score for a child, it should not necessarily mean that this child's total score would fall below the lower bound of the TD normal range.

Section D: Family history. Recent research has revealed genetic influences on the expression of LI (Bishop, Adams & Norbury, 2006; Rice, 2007), and family history has been shown to be a significant predictor of language delay and impairment (Hadley & Holt, 2006; Leonard, 1998; Restrepo, 1998). There are two questions in section D designed to obtain family history information, both indirectly (question 17) and directly (question 18). Our consultations and pilot testing indicated that there are barriers that often make it difficult to obtain family history information in a multicultural context. First, families might come from regions where there have been conflicts, wars, displacements, and economic hardship; therefore, tracking educational experiences and outcomes for family members is complicated and lack of school success might be entirely environmental in nature. Second, in some societies, special education services are not conceived of in the same way or as widely available as they are in Western countries, and thus, recognition of family members having mild language or literacy problems might not be possible. Third, for many families there can be cultural barriers to disclosing information about relatives, and potential shame involved in admitting that a family member has language or literacy problems. Because accurate parent report of family history might not be easily obtained in some cases, this section has a smaller weight (9 points) than the other sections.

2.4 Procedures

Families were visited in their homes by a research assistant and a cultural broker/interpreter, the latter being usually from the Multicultural Health Brokers Cooperative. Questions were given orally to a parent, most often the mother, and responses were written by the assistant, both rating scale choices and qualitative comments. The ALDeQ was administered in addition to another questionnaire on the child's use of the L1 and English with family members and others outside the home. Unless the child was tested by research assistants at his/her school, the home visit also included a battery of English language tests and the non-verbal IQ screen. The language use questionnaire results were used to calculate age of onset of English exposure and months of English exposure, which are given in Table 1. Only ALDeQ scores are analysed in detail in this study.

The scoring scheme for the ALDeQ is given in the appendix. Essentially, each question is scored on a scale where lower numbers would be more indicative of children with language delay/impairment, and higher numbers more indicative of children with typical language development. Questions that parents do not want to answer or cannot answer are omitted from the numerator and denominator of the score for the section, and the score for the questionnaire as a whole (ALDeQ total score). The section scores and the total score are proportions, and thus can range from 0 – 1.0. In the sample for this study, parents tended to answer all, or nearly all, the questions, so very few children have missing scores for more than one question, or for a whole section ($N < 6$). The analyses presented are based on ALDeQ total scores, scores for the four sections, and scores for individual questions.

3. Results

3.1 ALDeQ total scores

The distribution of ALDeQ total scores for the TD and LI group are presented in Figure 1 in box plots. Independent sample t-tests confirmed a significant difference between the means of the two groups (TD = .81 vs. LI = .50, $t(166) = 11.542$, $p < .001$, $d = 2.10$). The lower bound of the 1 standard deviation range for the TD group was .69, and the upper bound of the 1 standard deviation range for the LI group was .67. The extent of the between-group separation is revealed by the large effect size, which suggests 81.1% non-overlap (Cohen, 1988). On an individual level, 14% (19/139) of the TD children had scores in the 1 standard deviation range of the LI group, and 10% (3/29) of the LI group had scores within 1 standard deviation of the TD group.

INSERT FIGURE 1 ABOUT HERE

The t-test analysis was followed up by a linear discriminant function analysis with the ALDeQ total scores. This analysis yielded a significant Wilk's Lambda ($\Lambda = .555$, X^2 (1, N=166) = 97.51, $p < .001$). The canonical correlation (.667) and Kappa (.647) values indicate that ALDeQ scores have moderate accuracy in prediction. Predicted group classification is given in Table 2. The data show superior specificity to sensitivity as 96% of TD children were correctly classified, but just 66% of LI children were correctly classified. The cross-validation results in the second part of Table 2 suggest that this group classification would be similar given a new sample.

INSERT TABLE 2 ABOUT HERE

Because the children in this study have diverse linguistic/cultural backgrounds, a univariate ANOVA was conducted between the four language groups among the TD children. This analysis was not conducted with the children with LI because the numbers of children within each language/culture group was too small. The ANOVA just missed significance ($F(3, 135) = 2.490$, $p = .063$; Cantonese/Mandarin: .84 (N = 33); Farsi/Hindi/Punjabi/Urdu: .81 (N = 60); Arabic: .76 (N = 30); Portuguese/Spanish: .80 (N = 16)), suggesting a trend toward between-group differences. The Farsi/Hindi/Punjabi/Urdu and Portuguese/Spanish groups had mean proportions close to or at the mean for the entire group of children, .81 and .80 respectively, while the Arabic group had a lower mean of .76, and the Cantonese/Mandarin group had a higher mean of .84.

3.2 ALDeQ section scores

In order to further understand the extent to which the ALDeQ data differentiated between the TD children and the children with LI, and to address research questions (2) and (3) regarding retrospective parental report and L1 attrition, between-group analyses were conducted on ALDeQ section scores and for individual questions within each section. The mean scores and the results of independent sample t-tests are in Table 3 for the sections and in Table 4 for individual questions. As shown in Table 3, significant differences between the TD and LI groups emerged for each section; however, large effect sizes were found for sections A and B whereas medium effect sizes were found for

C and D. In spite of significant differences between the groups, the children in both groups had their lowest scores for section B, suggesting that some L1 attrition might be apparent in this sample. Comparisons in the rating scores for each question revealed significant between-group differences or trends (p =.056 -.07) for 15/18 questions. Within sections A and B, significant between-group differences were found for all questions. In contrast, for section C, responses to questions 13 and 14 showed no significant differences between the groups; likewise for question 17 in section D. Absolute scores for questions 14 and 17 were higher for the TD group, and thus they contribute to the between-group differences for C and D section scores. For question 13, the nearly equivalent and low scores between the groups were the result of the vast majority of parents reporting that the main activity their child engaged in was watching television.

INSERT TABLE 3 ABOUT HERE

INSERT TABLE 4 ABOUT HERE

Since the analyses in Table 3 indicated that group separation for some sections was superior to others, we explored this further using linear discriminant function analyses where section scores, instead of the total score, were entered one by one. As shown in Table 5, all models were significant; however, the standardized canonical discriminant function coefficients revealed unequal contributions of each section score, with section D having the smallest coefficient. Furthermore, even a model with just sections A and B

yielded a canonical correlation value in the moderate range, and the model with A, B and C yielded a similar canonical correlation value to the ALDeQ total score model above: .673 and .667, respectively. Finally, a stepwise linear discriminant function analysis with the section scores entered selected a final model with A, B and C included. There were no differences in sensitivity and specificity between the models based on total ALDeQ scores, on A+B+C section scores, or A+B+C+D section scores. Models with A only or A+B had lower sensitivity and specificity.

It is possible that section A scores for both groups would have been influenced by birth order and age such that if children were older or later-borns, parental retrospective report might not have been as accurate as for first-born younger children. Although we cannot assess accuracy of parental retrospective report of early milestones, Pearson correlations between children's ages, birth order and section A scores were all non-significant, indicating that parental retrospective report on the ALDeQ was not associated with these factors.

Recall that the TD and LI groups differed in age of onset of English exposure and amount of English exposure. Because the LI group had lower scores for section B, it is important to determine whether the lower scores were due, in part, to greater L1 attrition in this group. Pearson correlations between section B scores and AOE (age of English onset) and MOE (months of exposure to English) were non-significant for both the TD and the LI groups. Therefore, learning English earlier and being exposed to English longer was not associated with lower section B scores in this sample. Furthermore, the ALDeQ section B includes a direct question about attrition, (10b) "Do you think he/she may be losing the mother tongue in favor of English?", that is unscored, but present to

assist in the interpretation of the questionnaire by a clinician or researcher. For this study, we assigned a numeric response to this question, 0 = yes and 3 = no (following the 0-3 scoring scheme for the rest of the questionnaire). An independent sample t-test showed there was no significant difference between the TD and LI groups in the score for this question (TD = 1.54 vs. LI = 1.12), although the low mean numbers for both groups point to the presence of L1 attrition in some children, at least from their parents' perspective.

In the analyses of total ALDeQ scores above, a trend toward group differences according to culture/L1 group emerged. It is possible that this trend is not a reflection of culturally-based parental differences in reporting, but instead reflects differences in L1 attrition between newcomer groups. This explanation does not receive much support in these data. The ranking of the groups according to total ALDeQ scores (Chinese = .84 > South Asian = .81 > Romance = .80 > Arabic = .76) does not correspond directly to the ranking of the groups in response to the question of whether the child was losing his/her L1 (Romance = 2.00 > South Asian = 1.56 > Chinese = 1.50 > Arabic = 1.30), nor to the ranking of the groups according to section B scores, where the source of the differences in the ALDeQ total scores ought to be if this explanation were on the right track (Romance = .77 > Chinese = .75 > Arabic = .66/South Asian = .66).

The children with LI had lower non-verbal IQ scores than the TD children. Because section C asks several questions related to cognitive functioning, it is reasonable to ask whether the section C findings could be related to these IQ differences. A Pearson correlation between CMMS raw scores and section scores was small but significant (r = .187, p = .02), confirming some relationship.

4. Discussion

The purpose of this research was to develop and test a parent questionnaire on the L1 development of ELL children. Our specific goal was to investigate how effective such a questionnaire might be as an instrument to be included in an assessment battery used with ELLs in diverse multilingual contexts where a child's L1 cannot be examined directly. The study included TD ELL children and ELL children with LI, the latter group being recruited through speech-language pathologists' caseloads or special education programs for children with language delays. The questionnaire, the ALDeQ, consisted of 18 questions on the following topics: early milestones, current L1 abilities, behaviour patterns and activity preferences, and family history. Analyses were mainly aimed at investigating the extent to which the ALDeQ scores could differentiate between ELL children with typical versus impaired language development.

Both the t-test and discriminant function analyses showed that the ALDeQ total scores were good discriminators between the TD and LI groups, and furthermore, significant between-group differences were found for each section score, and for the majority of questions when examined individually. Analyses also showed no significant differences in the scores among cultural/linguistic groups, but there was a trend (p = .063), with the spread in scores ranging from .76 (Arabic) to .84 (Cantonese/Mandarin). On the one hand, the lack of substantial between group differences suggests that the ALDeQ has the potential to be used with ELL children from various cultural/linguistic backgrounds. On the other hand, the trend in the data indicate that further research on the issue of cultural differences in parent reporting using the ALDeQ ought to be undertaken. (Also, see discussion about using the ALDeQ with different kinds of bilingual children in 4.5).

Analyses also showed that scores did not differ as a function of children's chronological age, age of English onset, months of exposure to English, or birth order. Overall, these results suggest an affirmative answer to our first research question, "Can parent questionnaire data on L1 development differentiate children with LI from TD children among ELLs?" Nevertheless, it is important to point out that while ALDeQ scores showed good specificity, their sensitivity was poor, which is not a surprising result given the spread of scores for the LI group as displayed in Figure 1. One possible reason for this asymmetry could be that the LI group included some children who had been misidentified. Because assessment with this population could be considered less accurate than for English monolinguals, misidentification is always a possibility in a clinical sample of ELL children. However, we cannot verify whether this is the case for individual children in this study. We return to the issue of low sensitivity when we discuss recommendations for clinical use of the ALDeQ in 4.5

4.1 Retrospective parent report

Our second research question was concerned with whether retrospective parent report would be reliable because it was based on past developmental events, and if so, whether responses to these questions would differentiate between the groups. Contrary to our concerns, section A produced greater separation between the groups than the other sections, shown by both effect sizes and discriminant function coefficients. Moreover, the ages given as answers to the questions on beginning to walk, first word and first word combinations were very similar to those found by Trauner et al. (2000) for monolingual, American children, with differences between studies for each milestone ranging no more than 3 months for either TD or LI. In the present study, the following mean ages in

months that were provided for these milestones were: (1) walking: TD = 12.1, LI = 14.4; (2) first word: TD = 13.0 and LI = 22.0, and (3) sentences: TD = 20.8, LI = 34.1. The ages found by Trauner et al. (2000, p. 472) are as follows: (1) walking: TD = 11.8, LI = 13.0; (2) first word: TD = 10.3, LI = 22.7, and (3) sentences: TD = 17.1, LI = 36.5. These striking parallels suggest there might be uniformity cross-culturally in recalling and reporting basic early milestones. These parallels also suggest, albeit indirectly, that the parental information given in the present study could be accurate. Regarding the question of the reliability of retrospective parent report, it might be the case that parents would have difficulty recounting details of their children's past vocabulary knowledge or sentences produced, but that the timing of basic milestones are so salient, that this information is not difficult to recall.

4.2 Parent report and L1 attrition

Our third research question asked whether differentiation between the groups would be possible, given the potential for parents to rate their TD children's L1 abilities as low due to L1 attrition. Results of our analyses indicated that both groups showed signs of L1 attrition. Section B scores were the lowest for both groups, and parents' responses to a direct question about L1 loss were similar for both groups. Nevertheless, section B scores were the second strongest discriminator between the groups, as revealed by effect sizes and discriminant function coefficients. Thus, differentiating ELL children with LI from TD ELL children on the basis of current L1 abilities appears to be possible in spite of the phenomenon of L1 attrition. However, it is important to keep in mind the potential for L1 attrition to lead to misidentification on an individual basis. Of the 139 TD children in this study, 10 had a profile of ALDeQ scores suggesting L1 attrition could

produce unusually low scores. These children all showed the following pattern: ALDeQ total score within 1 standard deviation of the LI range, section B scores -1 standard deviation or lower than the TD mean, section A, C and D scores well within the TD normal range, and parents who answered "yes" to question 10b about L1 loss. Therefore, while parent report of minority children's current L1 abilities in general can differentiate typical from atypical children, individual profiles still need to be considered. We elaborate on this point below in 4.5.

4.3 Family history as a discriminator

The large standard deviations in mean scores for section D for both groups in Table 3 attest to the variability in responses to this section. While section D scores were significantly different between the groups in the t-test analysis, the discriminant function analysis did not suggest section D scores contributed much toward differentiation. This result contrasts with the findings of Restrepo (1998), who found positive family history to be one of the prominent discriminatory factors. As discussed in 2.3, we anticipated that family history information would be difficult to obtain in culturally diverse settings. Furthermore, different studies have produced varying prevalence rates for positive family history in samples of monolingual LI children (as reported in Restrepo, 1998). Therefore, some variation in prevalence, in addition to potential cultural factors in willingness and ability to report family history, could have co-occurred in these data, and in so doing, diminished the influence of this factor. In spite of section D scores contributing the least to the between-group discrimination in this study, it was decided to include this section in the final version of the questionnaire for the following reasons: First, the analyses showed that including section D did not reduce the predictive accuracy of the ALDeQ.

Second, other research has found positive family history to be a good discriminatory factor. Third, responses to the section as a whole and to question 18 in particular were significantly different between the groups. Finally, on an individual basis, some families provided very clear and definitive information regarding a positive family history for a child with LI, i.e., the child had first degree relatives with language delays and/or literacy problems. Therefore, it could be important to include this section in case a parent is able and willing to provide positive family history information when it exists.

4.4 Limitations of the present study

Unlike some other studies of parent report (e.g., Dale, 1991; Lee et al., 2009; Thal et al., 1999), this study was not designed to assess the validity or accuracy of parental report. Doing so would have entailed comparing parent report on specific linguistic structures to direct measures of children's use of those structures. The ALDeQ asks parents to evaluate general rather than specific aspects of their children's L1 use, and thus, a validity analysis would have to include additional questions about characteristics particular to the target languages. Such a validity analysis would have complemented the differentiation analyses presented here, and furthered our understanding of the cross-cultural accuracy of parent report. But, it was simply not possible to undertake validity analyses given the diversity of the L1 backgrounds, and the absence of research-based information about what structures to inquire about for each one (with the exception of Spanish). Furthermore, this study also did not include a test-retest reliability component where parents were given the same questionnaire at a different time, to compare whether their reporting was generally consistent. The logistics of the overall data collection procedures, of which the ALDeQ was only one measure, did not permit us to return to

children's homes. Future research with the ALDeQ is planned that will include both validity and test-retest reliability through working with children and parents from a language group where direct measures of the L1 could be obtained, Spanish for example, and returning to children's homes would be a possibility.

Another limitation of this study was that parents of the children with LI knew their children were seeing a speech-language pathologists and/or in special kindergarten programs. This could have influenced their responses, although, for some questions more than others. For instance, awareness of clinical diagnosis might make parents likely to rate overall satisfaction or comparisons of their child to other children lower (questions 8 and 9). But, awareness of diagnosis might not necessarily cause them to answer differently from parents of TD children on questions in section C, because they might not know there can be connections between certain behaviors and language learning difficulties. Furthermore, even if parents were aware that their child was delayed in general (question 4), this might not influence their recall of the actual ages in months for early milestone achievements (questions 1 to 3), and yet, these ages were very close to those reported in Trauner et al. (2000). The issue of parents being aware of diagnosis is a problem for all research using a clinically-identified sample. While this kind of sample was the only option available to conduct this study, future research testing the ALDeQ with a sample of ELL children before any assessments have taken place would further contribute to our understanding of the clinical usefulness of this parent report instrument.

Finally, as mentioned above in 4.0, the low sensitivity of the ALDeQ might have arisen because there were some children in the LI group who had been misidentified. After all, if measures and protocols already existed that permitted the accurate identification of LI

among ELL children, there would be fewer reasons for conducting this kind of research. Future research with children whose L1 could be examined directly would not only be useful for examining the validity of the ALDeQ, but it would also be useful for determining whether low sensitivity in this study was an artifact of the sample of children. This is because including a sample of ELL children with LI whose assessment was based on direct examination of both languages would be less likely to include misidentified children.

4.5 Recommendations for clinical practice

In this final section we discuss some guidelines and cautions for use of the ALDeQ in clinical practice. This study showed ALDeQ scores to be moderately good discriminators of children with LI among ELLs, and as such, the ALDeQ could be a useful addition to an assessment battery for ELL children in the late preschool/early school age years. The ALDeQ would be particularly useful in a context where direct examination of a child's L1 development is limited or impossible. The ALDeQ could also contribute information that is complementary to information gathered through direct examination of the L1. After all, parents have more experience with their child, and in more diverse settings, than a clinician (cf. Thal et al., 1999). The ALDeQ could be used to gather informal, qualitative information about a child, and it also could be used to obtain a score to be norm-referenced. The ALDeQ in the appendix has information for score calculation and interpretation, with norm referencing based on the score distributions of the ELL children with typical development from this study. Our discussion in this section, cautions in particular, are mainly focused on considerations for interpreting the ALDeQ in terms of the normative data provided.

Different kinds of bilingual children. On the last page of the ALDeQ, a brief description of the norming sample characteristics is given. This is because bilingual children have different experiences with their two languages that could lead to different outcomes, and not all bilingual children are ELLs, even in an English majority context (Genesee et al., 2004). This is an issue for section B scores in particular. Bilingual children who are *not* from first generation newcomer families might have different outcomes for section B questions and scores. To give one example, French-English bilinguals in Canada speak two languages that enjoy high status and have support in educational institutions even in an English majority context; therefore, this population of children could be expected to have strong French L1 abilities, and higher section B scores, than those found in this study. Another example would be children from second/third generation migrant families, where English has been the predominant household language since the child's birth. For this population, section B scores on minority language abilities might be lower than the ones found in this study. By contrast, sections A, C and D are less likely to be sensitive to differences in bilingual experiences. For example, although there are some distinct features of bilingual development, there is no evidence that the timing of basic milestones like first words and word combinations are changed by early exposure to two languages (Genesee et al., 2004; de Houwer, 2009). If using the ALDeQ with a child who does not fit the bilingual profile of the norming sample, interpretation of the total score must be treated with caution. Norm-based interpretation for the individual sections A, C and D, and qualitative-only interpretation for section B, might be preferred.

Omission of questions. The ALDeQ scoring system is designed so questions can be omitted if parents cannot, or would prefer not, to answer them. Adjustments can be made to both the numerator and the denominator of the final proportion scores, and thus, stability of the final score if a question is omitted is better than if raw scores from questions were totaled. However, too many omitted questions might compromise the ability to confidently interpret a child's score using the norm-referencing. If several questions are omitted, norm-referencing should be used with caution. If omitted questions are just in one section, section D for example, the child's performance could be interpreted section by section, using the norms provided for each section. An additional and related issue is the omission of questions, or sections, *a priori*, due to time constraints or other barriers. If clinicians need to choose to administer just one part of the questionnaire, section A, or sections A and B, would be the best choices since these proved to be the best discriminators according to the analyses in this study.

L1 attrition. Because L1 attrition is a common phenomenon among ELL children, it is important to keep in mind that an ALDeQ total score that is -1.25 standard deviations or lower from the TD group mean may suggest the presence of language impairment, but it may also suggest the presence of L1 attrition. We recommend checking for signs of L1 attrition by comparing across the section scores, and reviewing the answer to question 10, to see if section B scores are the main source of a low ALDeQ total score, and adjust interpretation accordingly. (This recommendation is given in the interpretation section of the questionnaire.) If a low total score does seem to be the result of L1 attrition and a low section B score, interpretation could be done based on the other three sections, using the section score normative information.

Sensitivity. While the ALDeQ proved to have good specificity in the study, i.e., it functioned well to correctly classify the TD children as being TD, the sensitivity was poor, i.e., it did not function well to classify the LI children as LI. We have already discussed that this result could be due to some children in the LI group in this study being misidentified. However, without further research to understand if this is indeed true, we recommend using the ALDeQ in conjunction with other measures, and with awareness of its superior specificity to sensitivity, for the purposes of identification of LI. Our intention when developing the ALDeQ was for it to be used as part of an assessment battery in any case. In a recent study with a subset of these ELL children, Paradis & Sorenson Duncan (2009) found that when the ALDeQ was used together with certain standardized measures of the children's English, e.g., measures of non-word repetition and accuracy with verb morphology, both good specificity and sensitivity in the discrimination of ELLs with LI could be achieved.

To summarize, use of the ALDeQ will provide information about the L1 development of ELL children that can be norm-referenced. Therefore, the ALDeQ could be included among other measures in an assessment battery in order to obtain this much-needed information about an ELL child's early development and current abilities in the minority language. Important cautions in using the ALDEQ include (1) making sure the bilingual child being tested has the general characteristics of the children in the ALDeQ norming sample, (2) making appropriate adjustments to the interpretation if there is an indication that the child is experiencing L1 attrition, and (3) keeping in mind that the ALDeQ has superior specificity to sensitivity when interpreting scores for identification purposes.

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Appendix

Alberta Language and Development Questionnaire (ALDeQ)©

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A. Early Milestones

1. When did your child first begin to walk? _____	3 = < 15 months 0 = > 16 months **Score: /3**
2. How old was your child when he/she first spoke a word? _____ *Examples of the child's first words (with translations):*	6 = <15 months (infant) 4 = 16-24 months (older toddler) 0 = >25 months (2 years or older) **Score: /6**
3. How old was your child when he/she began to put words together to make short sentences?_____ *short sentences = two words, example = 'more milk' 'more water'* *Examples of short sentences (with translations):*	6 = <24 months (toddler) 4 = 25 - 30 months (2 to 2 ½ roughly) 0 = > 31 months(closer to age three or older) **Score: /6**
4. When you think about other children you know at that age, do you think your child was different about when he/she started to use language? *If parent says CHI is better or quicker, score as number 3. Only score as different if parent says CHI is behind other children.* **3 = not different at all; 2 = a little different; 1 = quite different; 0 = very different**	**Score: /3**
To calculate the subtotal for Section A, add the total possible score for all questions answered as the denominator. Then add the scores for the parent's responses as the numerator. If all questions were answered, the denominator would be: 18	**SUB TOTAL A** **/**

B. Current Abilities in the First Language

**Compare the child to other ELL children, except for question 10*

5. Compared with other children of the same age, how do you think that your child expresses him/herself? **0 = not very well; 1 = a little less well; 2 = the same; 3 = very good/better/one of the best**	**Score: /3**
6. Compared with other children of the same age, how do you think your child pronounces words? **0 = not very clearly; 1 = sometimes not clear; 2 = same; 3 = very clear, one of the best**	**Score: /3**
7. Is it easy for your family or friends to have a conversation with your child? **3 = very easy; 2 = easy enough; 1 = sometimes not easy; 0 = no, very hard**	**Score: /3**
8. Compared with other children of the same age, does your child have difficulty producing correct sentences? *Example: have appropriate vocabulary, correct grammar, long enough sentences to get the idea across* **3 = no difficulties, maybe better; 2 = same; 1 = some difficulties; 0 = a lot of difficulties**	**Score: /3**
9. Are you satisfied with how your child speaks your mother tongue? **3 = completely satisfied; 2 = satisfied; 1 = maybe not satisfied; 0 = not satisfied at all**	**Score: /3**
10. Do you think your child speaks your mother tongue like the children in the home country? **0 = not as good as home country; 1 = sort of like home country, with some differences; 2 = mostly yes – close to home country; 3 = yes – better or just like home country**	**Score: /3**
10b. Why are you not satisfied? Why do you think your child is different from children in the home country? Do you think he/she may be losing the mother tongue in favor of English?	
To calculate the subtotal for Section B, add the total possible score for all questions answered as the denominator. Then add the scores for the parent's responses as the numerator. If all questions were answered, the denominator would be: 18	**SUB TOTAL B** **/**

C. Behaviour Patterns and Activity Preferences

11. Does your child like to read books or have books read to them? **0 = never; 1 = rarely; 2 = sometimes; 3 = very much**	**Score: /3**
12. How does your child read and write (in the mother tongue) compared with other children his/her age? *If young, read & write = numbers and alphabet/characters and some word recognition. If never been taught, omit this question* **0 = noticeably worse than other children; 1 = not as well as other children; 2 = same as other children; 3 = very well, maybe better**	**Score: /3**
13. What kind of activities does he/she like to do? **3 = Language games (ex. reading, writing, playing school)** **2 = Cognitive games (ex. puzzles, drawing, mind games, computer games, cars)** **1 = Physical games (ex. soccer, baseball, swimming)** **0 = Other (ex. television, video games, dress-up, or childish games for age)**	(if the parent indicates more than one category, take the total of the scores divided by the number of scores, then round up the answer if necessary) **Score: /3**
14. How quickly / how easily does your child learn new things? *Examples: sports; words; games/puzzles; with new toys (learn the rules of a team sport like soccer, put legos together, computer games)* *Examples of child learning new things:* **3 = same day/immediately; 2 = a few tries; 1 = needs help and time to learn it; 0 = long time/sometimes never learns it**	**Score: /3**
15. What are the activity patterns shown by your child? *Explanation: Activities = games, eating, watching TV, playing with toys/crafts, music, dancing. Starts one or more of these and does she/he finish what she/he starts?* **3 = one activity at a time and finishes it; 2 = one or two activities at a time, and finishes one; 1 = two to four activities at a time and finishes one;** **0 = more than two/many activities at a time, and seldom finishes any of them**	**Score: /3**

16. Does your child get frustrated when he/she cannot communicate his/her ideas? **3 = not at all; 2 = sometimes; 1= often; 0 = frequently**	**Score: /3**
To calculate the subtotal for Section C, add the total possible score for all questions answered as the denominator. Then add the scores for the parent's responses as the numerator. If all questions were answered, the denominator would be: 18	**SUB TOTAL C** **/**

D. Family History

17a. Can you tell us about your relatives? What kind of education and professions do they have in the home country? *The purpose of this question is to provide a context for interpreting responses to question 17b*	
17b. Did all the members of your family finish high school? If they say no, then why?	3 = Yes 0 = No **Score: /3**  If parent gives a reason that is environmental or external (ex. war or lack of funds, accessibility) do not score this question

18. Is there anyone among the child's immediate family or other relatives who had difficulties learning to read and write, in speaking and pronunciation, slow to learn to talk? Can you explain?

If parent is open to more detailed questions, and they seem to have a history, then go on using the bottom portion as a guide, either from what they volunteer as descriptions, or by asking the questions directly. *<u>You need not ask all of them</u>*

	brother or sister	father	mother	relatives of the father	relatives of the mother
Difficulties in school or learning	Y N	Y N	Y N	Y N	Y N
Language or pronunciation problems, like in sentences, words, and grammar or stuttering	Y N	Y N	Y N	Y N	Y N
Special education classes	Y N	Y N	Y N	Y N	Y N
Speech and language therapy	Y N	Y N	Y N	Y N	Y N
Problems following directions or understanding questions	Y N	Y N	Y N	Y N	Y N
Problems reading or learning to read	Y N	Y N	Y N	Y N	Y N
Difficulty learning English	Y N	Y N	Y N	Y N	Y N
Repeated one or more grades in school	Y N	Y N	Y N	Y N	Y N

Positive family history?

6 = No indication

3 = Yes, possibly

0 = Yes, definitely

Score: /6

Note: for a score of 6 the parent must indicate there is no history, if the parent is uncomfortable answering this question or does not know the answer, do not score the question.

If parent gives a reason that is environmental or external (ex. trauma or surgery) do not consider these responses for positive family history

To calculate the subtotal for Section D, add the total possible score for all questions answered as the denominator. Then add the scores for the parent's responses as the numerator. If all questions were answered, the denominator would be: 9

SUB TOTAL D

/

***Calculating the ALDeQ Total Score*: Add all numerators and denominators from sections, and calculate a proportion between 0 and 1.0.**

Section A = / (18)

Section B = / (18)

Section C = / (18)

Section D = / (9)

Total = / = _____

***Norming sample characteristics*: 139 English language learners in Canadian cities with a mean age of 69 months (1 standard deviation range = 62 to 76 months), and an average of 17 months exposure to English in preschool or school (1 standard deviation range = 7 to 27 months).**

***Score Interpretation*: An ALDeQ Total Score that is -1.25 standard deviations or lower indicates the child's first language development profile is more consistent with children who have language impairment than children who have typical language development.**

ALDeQ Total Score Mean	1 sd range	Score -1.25 sds	Score -1.5 sds	Score -2 sds	Score -2.5 sds	Score -3 sds
.81	.69-.93	.66	.63	.57	.51	.45

Note. "sd" = standard deviation

If a child's score is -1.25 standard deviations or lower, it is advisable to calculate and check the section scores, and the parents' answer to question 10b. If the child has scores for sections A, C and D in the 1 sd range, but section B scores are low, and parents indicated first language loss could be taking place, then it is possible the low ALDeQ Total Score is not suggestive of the presence of language delay/impairment.

Mean Score A	Score -1 sd A	Mean Score B	Score -1 sd B	Mean Score C	Score -1 sd C	Mean Score D	Score -1 sd D
.90	.71	.69	.43	.82	.69	.83	.53

Table 1.

Children's Ages, Age of Exposure to English, Months of Exposure to English, Birth Order and Non-Verbal IQs

	N	Age	AOE	MOE	Birth	NVIQ
TD	139	69 (7)	53 (11)	17 (10)	2.8 (1)	104 (12)
LI	29	70 (12)	44 (14)	26 (15)	2.9 (1)	96 (12)
		ns	$t(166) = 3585$, $p < .001$	$t(166) = -4.256$, $p < .001$	ns	$t(158) = 3.149$, $p = .009$

Note. AOE = age of exposure to English in months, MOE = Months of exposure to English, Birth = birth order, NVIQ – non-verbal IQ. Standard deviations are in parentheses.

Table 2.

Classification Table from Linear Discriminant Function Analysis for ALDeQ Total Scores

		Predicted Group Membership		
		TD	LI	Total
Original	TD	96% (133)	4% (6)	139
	LI	34% (10)	66% (19)	29
Cross-validated	TD	96% (133)	4% (6)	139
	LI	34% (10)	66% (19)	29

Table 3.

Between-Group Comparisons of ALDeQ Section Scores

	A=Early Milestones	B=Current L1 Abilities	C Behaviour and Activities	D=Family History
TD	.90 (.19)	.69 (.26)	.82 (.13)	.83 (.30)
LI	.49 (.32)	.34 (.25)	.70 (.18)	.55 (.45)
	$t(31.95) = 6.511$, $p < .001$, $d = 1.56$	$t(166) = 6.693$, $p < .001$, $d = 1.37$	$t(34.42) = 3.698$, $p = .001$, $d = .76$	$t(29.5) = 3.118$, $p = .004$, $d = .73$

Note. Degrees of freedom for sections A, C and D are based on equal variances not assumed

Table 4.

Between-Group Comparisons of ALDeQ Question Scores

Question	TD	LI	t-value	p-value
1. When did your child first begin to walk? /3	12.13 months score = 2.83	14.41 months score = 2.07	2.82	.008**
2. How old was your child when he/she first spoke a word? /6	12.96 months score = 5.45	21.96 months score = 3.41	4.29	<.001**
3. How old was your child when he/she began to put words together to make short sentences? /6	20.81 months score = 5.19	34.08 months score = 2.08	5.56	<.001**
4. When you think about other children you know at that age, do you think your child was different about when he/she started to use language? /3	2.70	1.17	7.85	<.001**
5. Compared with other children of the same age, how do you think that your child expresses him/herself? /3	2.19	1.10	5.34	<.001**
6. Compared with other children of the same age, how do you think your child pronounces words? /3	2.12	1.21	5.06	<.001**
7. Is it easy for your family or friends to have a conversation with your child? /3	2.42	1.24	5.95	<.001**
8. Compared with other children of the same age, does your child have difficulty producing correct sentences? /3	2.06	.90	5.98	<.001**
9. Are you satisfied with how your				

child speaks your mother tongue? /3				
	2.26	1.38	3.86	<.001**
10. Do you think your child speaks your mother tongue like the children in the hoe country? /3				
	1.41	.36	6.53	.001**
11. Does your child like to read books or have books read to them? /3				
	2.84	2.59	1.93	.06†
12. How does your child read and write (in the mother tongue) compared with other children his/her age? /3				
	2.07	1.5	1.84	.07†
13. What kind of activities does he/she like to do? (list) /3				
	1.75	1.81	-.281	.779 ns
14. How quickly/how easily does your child learn new things? /3				
	2.79	2.62	1.35	.186 ns
15. What are the activity patterns shown by your child? (list) /3				
	2.37	1.71	2.68	.011*
16. Does your child get frustrated when he/she cannot communicate his/her ideas? /3				
	2.53	1.67	3.24	.003**
17. Did all the members of your family finish high school? /3				
	2.43	2.31	.341	.734 ns
18. Is there anyone among your relatives who had difficulties learning to read and write, in speaking and pronunciation, or was slow to learn to talk? /6				
	4.99	3.12	3.17	.004**

Note. For questions 1, 2 and 3, absolute values as well as scores are given.

p = .056-.07† , p = .05-.01*, p < .01**

Table 5.

Linear Discriminant Function Analysis with ALDeQ Section Scores

	Wilk's Lambda	Canonical Correlation	Standardized Coefficients
Model = A	Λ = .660, X^2(1, N=167) = 68.236, p < .001	.583	---
Model = A+B	Λ = .574, X^2(1, N=167) = 90.992, p < .001	.653	A = .800 B = .555
Model = A+B+C	Λ = .548, X^2(1, N=167) = 98.476, p < .001	.673	A = .733 B = .522 C = .321
Model = A+B+C+D	Λ = .532, X^2(1, N=166) = 97.123, p < .001	.684	A = .729 B = .506 C = .245 D = .180

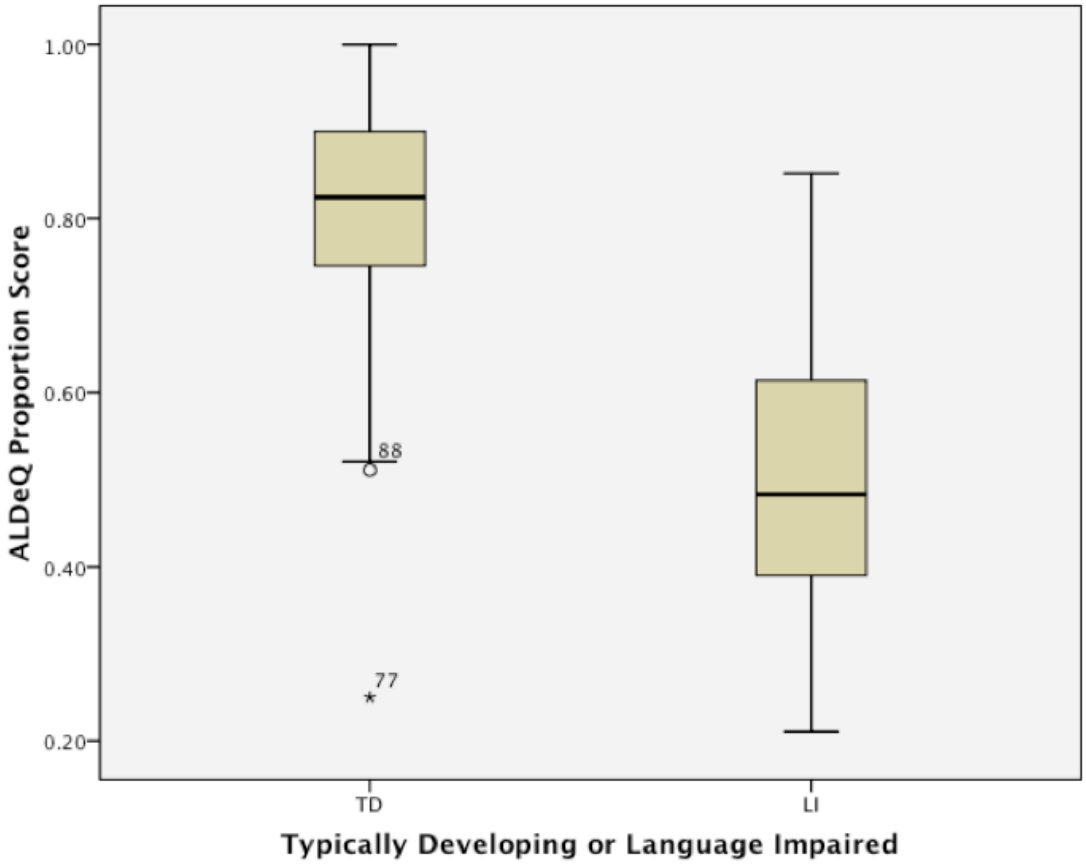

Figure 1. Box plots of ALDeQ total scores for the typically-developing and language-impaired groups of English language learners