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Design and Standardization of a Speech  
and Language Screening Tool for Use  
among School-Aged Bilingual Children in a  
Minority Language Setting

MICHÈLE MINOR-CORRIVEAU, CHANTAL MAYER-CRITTENDEN, ROXANNE BÉLANGER, MANON ROBILLARD,  
SIMON LAFLAMME, AND ALI REGUIGUI

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# Design and Standardization of a Speech and Language Screening Tool for Use among School-Aged Bilingual Children in a Minority Language Setting

Michèle Minor-Corriveau,<sup>1</sup> Laurentian University, Canada  
Chantal Mayer-Crittenden, Laurentian University, Canada  
Roxanne Bélanger, Laurentian University, Canada  
Manon Robillard, Laurentian University, Canada  
Simon Laflamme, Laurentian University, Canada  
Ali Reguigui, Laurentian University, Canada

*Abstract: This study investigated the psychometric properties of a speech and language screening tool “Profil de la langue, du langage et de la parole” (Speech and Language Profile) (PLLP-SLP) used with franco-dominant and anglo-dominant children aged forty-six to fifty-eight months who had entered the school system in kindergarten. All kindergarten students (1092 boys and 1080 girls) enrolled in a French-language school board in Northern Ontario in 2004, 2005, 2009, and 2010. They were assessed using the PLLP-SLP and formed the standardization sample for this norm-referenced language assessment tool. Reliable data is now available for this new speech and language screening tool to be used with French-English bilingual students entering kindergarten in a minority language setting. Scores for receptive and expressive language, as well as initial speech sounds and clinical judgment are available. An independent samples t-test revealed significant differences between groups on 4/10 subtests. In these instances, girls outperformed boys, though the difference was always slight (between .13 and .28), and anglophones outperformed francophones on one subtest, with the difference being less than .25. Speech-language pathologists working in minority language settings face particular challenges with respect to the absence of norms available for this population. Norms specific to language and gender should be observed when using this tool, as significant differences between girls’ and boys’ results, as well as between anglo-dominant and franco-dominant students living in a minority-language setting was observed.*

*Keywords: Standardization, Assessment, Reliability, Validity, Speech-Language Pathology*

## Introduction

Test standardization is a necessary step in establishing measures by which one’s performance is compared to that of other individuals. Standardized assessment tools are important to clinicians in that they should reflect the needs of the population that is targeted by the assessment objectives. They also allow clinicians to make a judgment on participants’ speech and language skills, as well as classify individuals among their age-matched peers. However, in certain clinical settings (i.e. minority language settings), many clinicians do not have tools that reflect the linguistic context in which they work (Paradis, Desrochers, and Garcia 2002). In the event that clinicians resort to using tests that have not been standardized on like populations, there are methods to establish norms for these populations (Brown and Bryant 1984). Though the American Speech-Language-Hearing Association (ASHA) and the American Psychological Association (APA) have recognized that this is less than favorable practice, it is common for clinicians to administer tests created in one language (i.e. English) to a population for which the test was not intended (i.e. French). Speech language pathologists (SLPs) abide by their regulatory bodies and ASHA who state that “it is not appropriate to simply translate, then

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<sup>1</sup> Corresponding Author: Michèle Minor-Corriveau, 935 Ramsey Lake Rd, Speech-Language Pathology, Laurentian University, Sudbury, Ontario, P3E 2C6, Canada. email: mminorcorriveau@laurentian.ca

use a test that has been developed and normed in a specific language” (2017a). However, practically speaking, when minority populations are faced with a lack of available standardized assessments, test translation is still common practice among those serving minority populations. Normative data is discarded, but qualitative analysis using these measures are used.

A lack of standardized assessments in French has been documented (Garcia et al. 2006). Consequently, it has been recommended that French test development and standardization occur in French, by francophones, for French-speaking targets, rather than translating or adapting tests from another language (Garcia et al. 2006). In Northern Ontario, Canada, a francophone linguistic minority region exemplifies this context. As of yet, no universal screening tool is available for use with the francophone population living in a minority setting. Even within majority settings, there does not appear to be a gold standard where speech and language screening tools are concerned (Wallace et al. 2015). In fact, a recent systematic review of the screening tools available for speech and language delay revealed that the optimal methods for screening have yet to be established (Nelson et al. 2016). Though there does not seem to be a set age at which speech and language screenings should occur, researchers seem to agree that screening for speech and language difficulties should happen sooner rather than later, and preferably before the age of four (e.g., Maas 2000). To date, no other speech and language screening test has been created in French, by francophones and for francophones living in Canadian minority settings. In order for an assessment tool to be reputable, it is imperative that normative data be obtained from the standardization sample in order to adequately reflect the population for which the tool is intended (Brown and Bryant 1984; de Weck and Marro 2010; Plante and Vance 1994).

The purpose of this study was to create and standardize such a tool. A brief description of the PLLP-SLP (*Profil de la langue, du langage et de la parole*—Speech and Language Profile), as well as the standardization procedures and preliminary validity data will be presented. This study, following the presentation of this assessment tool’s reliability and validity measures, will allow researchers to answer the following questions: Is this test reliable? Is this test valid for use with the population with which it is intended? Normative data will allow research to answer the following questions: Is there a significant between boys and girls on test items and subtest means? Is there a significant between franco-dominant and anglo-dominant students on test items and subtest means?

## **Background**

The main purpose of the PLLP-SLP is to identify which children would benefit from speech and language intervention through the Ontario Preschool Speech and Language Services (Ontario Ministry of Children, Community and Social Services, 2003). Thus it has been designed as a specific tool within the secondary level of prevention framework, as proposed by Leavell and Clark (1953) and later by Gerber (1990). For this reason, its main purpose is to help identify francophone children at risk for speech and language disorders in an effort to reduce the effects that speech and language disorders may have on their development. This study is well within the psychometry conceptual framework for test design and standardization.

The title of speech-language pathologist (SLP) is protected under the Regulated Health Professions Act (RHPA) (1991) and the Audiology and Speech-Language Pathology Act (1991). The title holder must be a registered member of the College of Audiologists and Speech-Language Pathologists of Ontario (CASLPO) and, as such, have completed a master’s degree or its equivalent and be recognized by CASLPO as being able to provide assessment and intervention services with respect to speech, language, and swallowing difficulties and disorders

(CASLPO 2017).<sup>2</sup> In Canada, the professions of speech-language pathology and audiology are governed by the province. CASLPO is the regulatory body for speech-language pathologists and audiologists in Ontario. According to CASLPO, a screening tool should only have two possible outcomes: pass/fail or pass/refer (CASLPO, 2017, 2014).<sup>3</sup> However, given that the purpose of the PLLP-SLP is to provide school-based SLPs and educators information regarding speech-language development and school readiness, the information provided by this tool is more than that which is expected from a simple screening test. Following the administration of the test, it is also possible to provide general recommendations to the caregiver and teacher regarding the student's performance and needs in the areas of speech and language. Though the PLLP-SLP provides more information than a screening, it is not intended to be as thorough as a speech and language assessment and is not meant to replace other more in-depth speech and language assessments. Instead, it is meant to provide recommendations in the short term, while participants are waiting for a more comprehensive speech or language assessment, often due to extensive waiting times for these services.

### *Linguistic Minority Setting*

In Ontario, francophones live in a minority context in most of the province. A linguistic minority context makes the development and maintenance of a minority language difficult because of the ubiquitous and often involuntary exposure to the English language (Gathercole and Thomas 2009; Hickey 2001, 2007). The children tested in the context of this study were living in a linguistic minority setting, that is, learning a minority language (i.e., French) while living in a linguistic majority setting (i.e., English). In this minority setting, it is common practice for anglo-dominant participants, that is, children who have been exposed mainly to the English language, to enter a French kindergarten class with very limited competencies in French. Under Section 23 from The Canadian Charter of Rights and Freedoms and the Education Act in Ontario (Ontario 1980), Canadian children are given the right to attend schools in French. However, the linguistic minority context makes the acquisition of a second language ( $L_1$  = English,  $L_2$  = French) quite challenging, as there are very few opportunities to communicate in this language outside of the classroom. In fact, it has been reported that it is even difficult for French monolingual children to master the French language, their first language ( $L_1$ ), in this environment (Mayer-Crittenden et al. 2014). For example, even if the school's language of instruction is French, in certain communities, children converse in English in the hallways and in the schoolyard. At home and elsewhere, they watch television in English, visit English websites and mostly read in English (internet, magazines) (Laflamme and Bernier 1998). Consequently, the moments of exposure to French are confined to the classroom and are intermittent at home. In fact, it is difficult to find French monolinguals who reside in certain regions of Northern Ontario and who have been exposed to a limited amount (less than five hours) of English per week (Laflamme and Bernier 1998; Laflamme, Corbett, and Southcott 2008; Laflamme and Reguigui 2003; Mayer-Crittenden et al. 2014).

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<sup>2</sup> Speech-language pathologists are concerned with the identification, assessment, treatment, and rehabilitation and prevention of communication and/or swallowing disorders in children and adults. SLP's scope of clinical practice includes the provision of assessment, treatment, and consultation services for: language delay and disorders; speech delays and disorders including apraxia, dysarthria, developmental articulation/phonology, and motor speech impairment not otherwise specified; communication disorders related to autism; developmental delays; learning disabilities; stroke; head injuries; cognitive disorders; hearing impairment and progressive neurological diseases; literacy; written communication; swallowing disorders; voice and resonance disorders; stuttering; alternative and augmentative communication needs; psychogenic communication and swallowing disorders; structural anomalies of speech and voice mechanisms.

<sup>3</sup> The role and authority of the college is set out in the Regulated Health Professions Act 1991 (RHPA), The Health Professions Procedural Code, the Audiology and Speech-Language Pathology Act 1991 (ASLPA), and the regulation made under these acts along with the policies and by-laws of the college.

It is therefore not surprising that it is difficult for SLPs to identify persistent delays in bilingual children. In particular, three characteristics of bilingual children make it difficult to identify those at risk for persistent delays: an uneven distribution of abilities in the child's two languages, cross-linguistic association within bilingual learners, and individual variation due to social circumstances (Maas 2000; Thordardottir et al. 2010). Speech-language assessments must take linguistic differences into consideration, otherwise an incorrect label or diagnosis of language disorder can be given when, in fact, differences could be due to the regional linguistic context.

### ***Test Design***

In Ontario, children begin school in the kindergarten program, a two-year program (Ontario Ministry of Education 2016). Children enter this program between the ages of forty-six months and fifty-eight months, and exit between sixty-eight months and eighty months. The PLLP-SLP was designed in French and in English for this population by SLPs employed by a francophone school board in Northern Ontario, Canada. All items within the PLLP-SLP were selected following published developmental charts and norms in each language (Bassano 2008; Piérart 2005; Rondal 1997). Following Sperber, Devellis and Boehlecke's (1994) recommendations, both versions of the PLLP-SLP were designed simultaneously.

### **Test Administration and Procedure**

A bilingual speech-language pathologist or a trained graduate research assistant with French as their first language and English as their second language assessed the children in their respective schools during school hours in a quiet room reserved for this purpose. Each assessment period lasted approximately fifteen minutes. The language of administration is determined by the student's dominant language. Assessment of a student's language abilities in his or her second or third language is likely to underestimate his or her performance, leading to misrepresentations of their skills in comparison to their monolingual counterparts (e.g., Paradis, Genesee, and Crago 2011; Owens 2008; Paradis, Desrochers, and Garcia 2002; Roberts et al. 2002). A total of 2172 participants were assessed in September of 2004, 2005, 2009 and 2010.

The two stimulus books (French and English) were printed in color and contained the same stimuli for all subtests, with the exception of the articulation subtest as different words are needed to reflect the targeted phonemes. Phonemes articulated incorrectly or substituted for other phonemes were scored as incorrect. For bilingual populations, it is typical for some phonetic substitutions to occur when children are learning more than one language (e.g., "dat" for "that," "free" for "three"). In these cases, the children were not penalized, but a recommendation to stimulate these sounds could be sent home or given to the school. Only atypical substitutions were scored as incorrect (e.g., phonological processes that should not be present between three years ten months and four years ten months—fronting, stopping, unstressed syllable deletion, among others). A checklist of phonological processes accompanied this subtest and was completed by the reporting SLP. Even though common phonological processes are noted on the checklist for monitoring purposes, only those not commonly present between forty-six and fifty-eight months were considered to be problematic and consequently flagged (Bowen 2007; Brosseau-Lapr e and Rvachew 2014; Grunwell 1981; Rondal 1997); these processes were outlined in the examiner's guidelines. An assessment form was completed for each student and a score was obtained for each subtest. Phonological processes were identified qualitatively by the reporting SLP, therefore no subtest score was attributed; rather, a list of atypical phonological processes was generated and recommendations were subsequently sent home and to the school.

### ***PLLP-SLP Subtests***

The PLLP-SLP is comprised of the following subtests: receptive language, which includes WH-questions (where, why, what, when, how); basic concepts (categorization, spatial concepts, body parts); two-step directions; expressive language (vocabulary: nouns, modifiers/adjectives, verbs); and articulation (speech sounds in initial position; phonological processes).

#### **Language**

Test items for each subtest can be found in Appendix A. Items aimed at assessing receptive language included WH-questions, identification of items within categories, spatial concepts, body parts and two-part directives. Expressive language tasks included naming common nouns, modifiers, and action words.

#### **Speech Sounds**

Most phonemes found in French and in English were part of the articulation and phonological processes subtest of the PLLP-SLP. See Appendix B for a list of all phonemes targeted in the English and French versions of the PLLP-SLP in initial position.

As the PLLP-SLP is meant to be a screening, speech-sound production was limited to initial consonant production and gave the clinician an idea of the child's ability to produce the sound in the easiest possible position. It should be noted that in French, final consonants develop slower than in other word positions (MacLeod et al. 2011).

The phonemes [θ], [ð], [ʒ], and [ɲ] were not included in PLLP-SLP because their rate of error was deemed too high at 3.10 to 4.10 years to be produced accurately by most children. Subsequent versions of the PLLP-SLP added these phonemes but no data is available to report. The semi-consonants and glides [w], [j], and [ɥ] were added in English and in French in order to assess the students' production of these sounds, as they tend to be problematic for French-language learners.

Brosseau-Lapré and Rvachew (2014) and Rvachew et al. (2013) have documented the influence of coarticulation and phonetic environment on speech sound production, more so than production of speech sounds in isolation, regardless of position. Consequently, the child's spontaneous production throughout testing served as an indicator of success and SLPs reported on phonological processes and articulation substitutions during the whole test, not just when targeting specific speech sounds within the articulation subtest.

In addition to the information gathered throughout the formal portion of the test, the PLLP-SLP record form also allowed the reporting SLP to make note of more subjective information. As such, qualitative information with respect to intelligibility (adequate, somewhat compromised, or severely compromised), fluency skills (adequate, mild, moderate, or severe dysfluencies) as well as vocal quality (adequate, raspy, hoarse, breathy, hypernasal, and hyponasal) was gathered. Through a spontaneous language sample, the SLP was also asked to identify areas of difficulty with respect to speech or other areas of language. A checklist targeting morphosyntactic structures, pragmatic skills, and the overall clinical impression was included in the PLLP-SLP for tracking purposes.

### **Method**

This study's aim was to standardize the PLLP, created by SLPs from a Northern Ontario school board. Information on procedure, test scoring, interpretation, participants, and in-group comparability will be presented. Reliability and validity measures will be demonstrated.

It was hypothesized that girls would outperform boys with respect to language-based tasks (Bauer, Goldfield and Reznick 2002; Bouchard et al. 2009; Desrosiers and Ducharme 2006). It was also hypothesized that anglo-dominant students would outperform franco-dominant students on test items and subtest means given that they would have been exposed to their dominant language more often than their franco-dominant counterparts.

### ***Procedure, Test Scoring, and Interpretation***

The PLLP-SLP takes approximately fifteen to twenty minutes to administer. Responses are scored as correct or incorrect, regardless of the language in which the answer was provided. For example, a word spoken in English by a participant during the administration of the French version of the screening would still be considered correct, even though the answer was not given in the language that the testing occurred. The SLP would, however, make note of this and could refer this participant to French or English as a second language services.

Many criteria have been used to determine language dominance. Some have used the language in which the child communicates with most ease (David and Wei 2008; Westman et al. 2008), while others have used language of exposure without identifying with whom this language is spoken (Thordardottir et al. 2011). Several studies have used the frequency of use in each language to establish dominance (Mayer-Crittenden et al. 2014; Pearson, Fernandez, and Oller 1993; Pearson et al. 1997). Brenneman, Morris, and Israelian (2007) as well as Fritz (2011), on the other hand, used the child's preferred language as evidence of language dominance. In Northern Ontario, a recent study identified children as being monolingual (French only) when they were exposed to less than five hours of input in their second language (English) and franco-dominant (mainly French speaking) if they were exposed to 24.4 hours per week in their second language (English). Anglo-dominant children (speaking mostly English) were exposed to English for 48.6 hours per week (Mayer-Crittenden, 2013). As this study took place in a French-language school board, language dominance was determined by first speaking French to the children. When children did not respond, did not seem to understand, or answered the question with mostly English words or syntax, the SLP reverted to English. In all cases, the test was conducted in the language with which the children seemed most familiar, similarly to Brenneman, Morris, and Israelian (2007) and Fritz (2011).

### ***Item Response Recording***

At the beginning of each session, the SLP determined the child's dominant language, by allowing the child to express him/herself freely. When scoring student responses, considering the languages separately would be a misguided interpretation. Grosjean (1989) stated that: bilinguals should not be considered in their separate abilities but rather in their combined abilities and the bilingual learner is a unique entity that cannot be described in monolingual terms ( $L_1$  vs  $L_2$ ). More recently, this has been supported by Bialystok et al. (2010). In keeping with these authors, the SLP investigated the participants as a combined language (dual language,  $L_1 + L_2$ ). Bullock et al. (2006, 9) summarized "...that bilinguals' language use is malleable in that they may behave differently according to which language they are producing or perceiving at a given time." Consequently, all answers reported in French, English, or at times in a third language were scored as correct, regardless of the language in which they were provided. All aspects of second-language acquisition as outlined by ASHA (2017b) were respected throughout the assessment protocol.

### ***Participants***

The PLLP-SLP was designed for use as a speech and language identification tool among children aged forty-six to fifty-eight months, which is the age at which children enter kindergarten in



Ontario, Canada. Participants were recruited through one French school board, located in Ontario and whose population exceeded 8000 students. Table 1 reports demographic data pertaining to all participants.

Table 1: Standardization Sample for PLLP-SLP with Respect to Gender, Language, and Gender/Language

<i>Group</i>	<i>2004</i>	<i>2005</i>	<i>2009</i>	<i>2010</i>	<i>Total</i>
<i>Gender</i>					
<i>Boys</i>	258	255	262	317	1092
<i>Girls</i>	249	292	256	283	1080
<i>Total Sum</i>	507	547	518	600	2172
<i>Language</i>					
<i>English</i>	301	371	335	382	1389
<i>French</i>	206	176	183	218	783
<i>Subtotal</i>	507	552	518	600	2172
<i>Gender and Language</i>					
<i>English-Speaking Boys</i>	151	167	170	200	688
<i>French-Speaking Boys</i>	108	89	93	118	408
<i>English-Speaking Girls</i>	150	205	166	183	704
<i>French-Speaking Girls</i>	98	86	89	99	372
<i>Subtotal</i>	507	547	518	600	2172

The demographic information collected for these participants allowed for comparability with the population of the city within which the school board is located, using information from the 2011 Census (Statistics Canada 2012). Census data for this same period indicated that 26.9 percent of residents of the Greater Sudbury area—where this study was held—was reported as French-speaking (francophone) while 64.5 percent of residents identified as being English-speaking (anglo-dominant). Given that the administration of the PLLP-SLP occurred at the start of the school year, very little information pertaining to the degree of balance between the two languages was made available. The sample contained 36 percent franco-dominant (speaking mainly French, with exposure to English through community) and 64 percent anglo-dominant (speaking mostly English, with little to no French exposure) children.

For the purpose of this study, the groups were divided fairly evenly with respect to gender, with 50.3 percent of participants being male and 49.7 percent being female. They were also representative of the linguistic population according to the 2006 census data (Statistics Canada 2007c), with 64.0 percent of participants being anglo-dominant (English being the language spoken within the home environment) and 36.0 percent being franco-dominant (French was the language spoken within the home environment). A subdivision of groups indicated that 31.7 percent of the standardization population were English-speaking boys, while 18.8 percent of the population was comprised of French-speaking boys. Also, 32.4 percent were English-speaking

girls while 17.1 percent were French-speaking girls. The PLLP-SLP was administered to all students enrolled in this school board in 2004, 2005, 2009, and 2010. Data was insufficient for years 2006 through 2008 as the PLLP-SLP was not administered consistently throughout the school board. Consent was obtained prior to administration. As part of a universal and systemic screening for the years listed, no student was exempted from this screening protocol. For the purpose of standardization, the only the data for the 2010 cohort was included. This is due to the fact that the previous years' results served as the basis for improving the PLLP-SLP. Consequently, slight changes were made from year to year, until 2010, and the previous years' data served as a basis to enhance the final version.

Data was obtained by gathering results from a total of 1092 boys and 1080 girls. In a linguistic minority setting, children are not often encouraged to speak English in a French-language school. For this reason, the SLP took great care in ascertaining the dominant language of communication. Since the first subtest aims to measure understanding of a few WH-questions, this was often the perfect opportunity to allow the child to converse in his/her dominant language. In some cases, the dominant language (either French or English) was already well-known and confirmed by the classroom teacher. In these cases, the SLP spoke with the child from the outset using his or her dominant language. In other cases, the dominant language was not well established. With these children, French was first used. If the child did not provide an answer to the question, the SLP repeated the question in English.

### **In-group Comparability**

Interlinguistic comparisons by gender allowed for in-group comparability: 31.7 percent were anglo-dominant males, while 18.8 percent were franco-dominant males; 32.4 percent of were anglo-dominant females while 17.1 percent were franco-dominant females. There was a fairly proportionate rate of males within each linguistic group, and this rate is equivalent to their distribution within the population. The same holds true for female representation within each linguistic group. All items were subjected to item analysis to determine the rate at which participants passed or failed each item. Subtest scores were calculated for each subtest: WH-questions, basic concepts (categorization, spatial concepts, body parts), articulation, phonological processes, vocabulary (common nouns, modifiers, action words). In order to ensure that the norms to be later used by clinicians reflect a performance typical of children, subtest means according to gender and language were calculated (i.e., for francophone girls, francophone boys, anglophone girls, and anglophone boys).

## **Results**

### ***Differences on Test Items***

As the PLLP-SLP is comprised of two comparable measures, regardless of language (with the exception of the articulation stimuli), interlinguistic comparisons were necessary in order to determine whether different sets of norms should be used for each population. The means obtained on subtest scores were compared for each linguistic group (French and English) and for each gender, for all forty test items (excluding speech sounds).

In order to understand the effect of language and gender on each individual variable, an item analysis using a Chi-square test was performed on each test item, for each linguistic and gender subgroup. A statistically significant difference was observed between boys' and girls' results on the following items: *why* (WH-questions) ( $x^2_{\text{(corrected)}} = 13.19$ ;  $p < .001$ ), *animals* ( $x^2_{\text{(corrected)}} = 8.72$ ;  $p < .01$ ), *clothing* (categorization) ( $x^2_{\text{(corrected)}} = 6.29$ ;  $p < .01$ ), *cup* (vocabulary—common nouns) ( $x^2_{\text{(corrected)}} = 5.56$ ;  $p < .05$ ), and *thumb* (body parts) ( $x^2_{\text{(corrected)}} = 10.18$ ;  $p < .01$ ).

Generally speaking, when a difference was observed with respect to linguistic dominance (French or English), anglo-dominant children outperformed franco-dominant children. A

statistically significant difference was observed on the following test items: *beside* (spatial concepts) ( $x^2_{\text{(corrected)}} = 4.62$ ;  $p < .05$ ), *cup* (vocabulary—common nouns) ( $x^2_{\text{(corrected)}} = 36.11$ ;  $p < .001$ ), *ladder* (vocabulary—common nouns) ( $x^2_{\text{(corrected)}} = 34.59$ ;  $p < .001$ ), *crying* (vocabulary—action words) ( $x^2_{\text{(corrected)}} = 7.53$ ;  $p < .05$ ), *big* (vocabulary—modifiers) ( $x^2_{\text{(corrected)}} = 5.84$ ;  $p < .05$ ), *thumb* (body parts) ( $x^2_{\text{(corrected)}} = 6.61$ ;  $p < .01$ ), *Take the box and shake it* (two-step directions) ( $x^2_{\text{(corrected)}} = 12.71$ ;  $p < .001$ ).

The item analysis revealed no significant differences between linguistic groups for all items pertaining to the following subtests: WH-questions, two-step directions, and categorization. As for gender, no significant differences were found on items pertaining to spatial concepts, action words, and modifiers.

### ***Subtest Means According to Gender and Language***

A *t*-test was performed to compare means with respect to each subtest by gender and language and to determine if specific norms should be used according to gender or language. A cutoff threshold was determined for each subgroup according to language and gender, based on the normed data obtained. The means for each subtest was used to calculate the cutoff threshold, with some means differing according to gender or linguistic dominance. In an effort to minimize false negatives, one point below the mean became the cutoff threshold. Participants whose results fell below the cutoff threshold would therefore be flagged by the SLP as requiring a follow-up.

Means obtained by language were more comparable by gender than by language, with the exception being the action words subtest. The anglo-dominant boys' means were more comparable to the anglo-dominant girls' means, as were the franco-dominant boys' means to the franco-dominant girls' means. Due to this observed difference, and since the articulation and phonology subtests have different subtest totals according to language, it is recommended that separate scores be used for each subgroup. Table 2 reveals scores to be used for each subtest of the PLLP-SLP, for each gender and linguistic group.

Table 2.1: Cutoff Threshold for PLLP-SLP Subtest Means at -1.5 (SD) for Each Subgroup

	<i>2010 Participants n = 600</i>	<i>Anglo- dominant Boys n = 200</i>	<i>Franco- dominant Boys n = 118</i>	<i>Anglo- dominant Girls n = 183</i>	<i>Franco- dominant Girls n = 99</i>
<b><i>WH-Questions M</i></b>	3.84	3.79	3.77	3.91	3.90
<i>Total /4 (SD)</i>	.50	.56	.56	.39	.46
<i>- 1.5 (SD)</i>	3.09	2.95	2.93	3.33	3.21
<i>Cutoff Score</i>	< 3	< 3	< 3	< 3	< 3
<b><i>Two-Step Directions M</i></b>	3.76	3.72	3.66	3.85	3.79
<i>Total /4 (SD)</i>	.66	.66	.89	.53	.52
<i>- 1.5 (SD)</i>	2.77	2.73	2.31	3.06	3.01
<i>Cutoff Score</i>	< 3	< 3	< 2	< 3	< 3
<b><i>Spatial Concepts M</i></b>	4.36	4.30	4.33	4.42	4.44
<i>Total /5 (SD)</i>	1.03	1.08	1.16	.93	.94
<i>- 1.5 (SD)</i>	2.81	2.68	2.59	3.03	3.03
<i>Cutoff Score</i>	< 3	< 3	< 3	< 3	< 3

Table 2.2: Cutoff Threshold for PLLP-SLP Subtest Means at -1.5 (SD) for Each Subgroup

	<i>2010 Participants n = 600</i>	<i>Anglo- dominant Boys n = 200</i>	<i>Franco- dominant Boys n = 118</i>	<i>Anglo- dominant Girls n = 183</i>	<i>Franco- dominant Girls n = 99</i>
<b>Articulation (ENG) M</b>	14.24	14.10		14.39	
<i>Total /16 (SD)</i>	2.07	1.98	--	2.16	--
<i>- 1.5 (SD)</i>	11.13	11.13		11.15	
<i>Cutoff Score*</i>	< 11	< 11		< 11	
<b>Articulation (FR) M</b>	14.58		14.56		14.61
<i>Total /16 (SD)</i>	1.64	--	1.68	--	1.60
<i>- 1.5 (SD)</i>	12.12		12.04		12.21
<i>Cutoff Score*</i>	< 12		< 12		< 12
<b>Categorization M</b>	3.80	3.76	3.71	3.88	3.87
<i>Total /4 (SD)</i>	.59	.66	.76	.39	.49
<i>- 1.5 (SD)</i>	2.62	2.77	2.57	3.30	3.14
<i>Cutoff Score</i>	< 3	< 3	< 3	< 3	< 3
<b>Body Parts M</b>	7.78	7.70	7.73	7.81	7.95
<i>Total /8 (SD)</i>	.53	.62	.59	.48	.22
<i>- 1.5 (SD)</i>	6.98	6.77	6.85	7.09	7.62
<i>Cutoff Score</i>	< 7	< 7	< 7	< 7	< 8
<b>Common Nouns M</b>	5.65	5.70	5.45	5.78	5.54
<i>Total /6 (SD)</i>	.72	.70	.84	.61	.75
<i>- 1.5 (SD)</i>	4.57	4.65	4.19	4.87	4.42
<i>Cutoff Score</i>	< 5	< 5	< 4	< 5	< 4
<b>Action Words M</b>	5.91	5.90	5.89	5.94	5.89
<i>Total /6 (SD)</i>	.52	.52	.68	.26	.65
<i>- 1.5 (SD)</i>	5.13	5.12	4.87	5.55	4.92
<i>Cutoff Score</i>	< 5	< 5	< 5	< 6	< 5
<b>Modifiers M</b>	3.92	3.93	3.91	3.93	3.89
<i>Total /4 (SD)</i>	.37	.33	.47	.25	.49
<i>- 1.5 (SD)</i>	3.36	3.44	3.21	3.56	3.16
<i>Cutoff Score</i>	< 3	< 3	< 3	< 4	< 3

Note. Recommendations and/or follow-ups are recommended for children whose language or articulation score falls below the cutoff score and/or exhibit atypical phonological processes for their age.

## Discussion

Girls have often been reported as outperforming boys on similar linguistic tasks (Bauer, Goldfield, and Reznick 2002; Bouchard et al. 2009; Desrosiers and Ducharme 2006). In this study, when significant differences were noted, girls outperformed boys, a result that is consistent with the current findings (Bauer et al. 2002; Bouchard et al. 2009). Though differences were found between boys' and girls' performances on seven out of forty items and between franco-dominant and anglo-dominant students on five out of forty items, the only item which a

significant difference was found in both analyses was the common noun *cup*. Though it could be suggested that this item be removed from the PLLP-SLP, a sensitivity and sensibility study could confirm whether or not a failed response on this item by either of the groups is necessary to establish a risk for a language disorder.

Even though this study was conducted among children enrolled in a French-language school board, given that French is the language of minority in this region, franco-dominant children who live in this region are, almost without exception, exposed to French and English. For this reason, we chose to use the term franco-dominant as opposed to francophone to describe the participants in order to account for this high exposure to the English language. The demolinguistic situation in which they live and interact greatly influence their communication skills. The increased demands on memory as related to bilingualism could be greater for franco-dominant participants than for anglo-dominant participants who attend the same schools. The difference found on a large number of items on the PLLP-SLP can possibly explain these hypotheses, especially with respect to vocabulary. Studies have shown that bilingual children achieve lower scores on vocabulary tests compared to their monolingual counterparts due to an unbalanced input (Pearson et al. 1997). In fact, many studies have shown that vocabulary knowledge is highly correlated to language input (e.g., Thordardottir and Brandeker 2013). Given that this study took place in a linguistic minority setting, it is probable that the anglo-dominant participants were more exposed to their dominant language than the franco-dominant participants, and that the French participants were also more exposed to their L<sub>2</sub> (English) than the English participants (French).

In Canada, where the two official languages often hold a different status depending on the geographic region, it is more common for francophones outside Québec to develop a high level of proficiency in their second language (English), than anglophones (French). Many factors influence language dominance and proficiency but, in general, input and exposure to either or both languages is a determining factor in balance and proficiency (Pearson et al. 1997). Studies have also shown that language status has an effect on language acquisition and maintenance. Gathercole and Thomas (2009) have shown that children who are brought up with two languages are likely to fully acquire the majority language of the community, but that their proficiency may remain incomplete in the minority language. In this study's sample population, franco-dominant children tended to be more bilingual while anglo-dominant participants tended to be rather unilingual.

When comparing means of subtest scores, with the exception of the items *leaf*, *cup*, and *ladder* (common nouns subtest), no statistically significant difference was found on any of the PLLP-SLP subtest totals. However, due to the slight differences reported, when using the PLLP-SLP it is recommended to refer to norms specific to each subgroup—those for franco-dominant girls, franco-dominant boys, anglo-dominant girls, and anglo-dominant boys (see cutoff scores in Table 2).

## Clinical Implications

Language development varies greatly from one child to the next, especially within linguistic minorities. Consequently, there does not appear to be a gold standard in the area of screening for speech and language delays in children (Van Agt et al. 2005). When it comes to individuals living in linguistic minority settings, research has shown that this is especially true.

Given the lengthy wait times for assessment and intervention, the results demonstrate that the PLLP-SLP can be used as a universal screening tool. The PLLP-SLP also allows SLPs to identify children who are entering kindergarten and might be at risk of demonstrating language disorders. Its very existence is justified by the absence of French-language tools available to francophone SLPs who practice in this minority language setting. However, the PLLP-SLP has the extra advantage of taking individual results into account and providing individualized recommendations to teachers and parents.

The advantage of a universal systematic tool is that when it is administered to all children in a school board, it allows them to have equal access to services, as early as possible in their developmental trajectory. Children who are seen by an SLP are also eligible to be referred for assessments in areas other than speech and language, namely psychometry, social work, or behavior therapy.

The timely manner in which SLPs are able to identify and treat students in need of speech and language services is critical and likely most effective when it occurs sooner rather than later. In the case of this tool, the PLLP-SLP is valid and reliable, allows for clinicians to benchmark student data, and the benchmark data allows clinicians to provide intervention.

## Limitations

This study was performed on the total population of students entering kindergarten in 2004, 2005, 2009, and 2010 in a French-language school board in Northern Ontario. No data was available for 2006 through 2008. While there is no evidence to suggest that having this data would alter results in any way, we must consider that when interpreting results. Franco-dominant speakers were included in this study, as were English-language learners (i.e., English speakers with limited exposure to French). No monolingual English speakers could be included in this study as they are not meant to be enrolled in French-language schools. Though some English-speaking students had limited exposure to the French language, most had some exposure to French, since their parents chose French as the language of instruction.

## Future Research

Due to the inadequate evidence on the effectiveness of screening for language delay and disorders, more research studying the feasibility of screening and the identification of the most effective screening instruments are needed (Siu 2015). Validity-based research is currently underway to assess concurrent and interrater reliability of the PLLP-SLP. Future research could include a sensitivity and sensibility study on the PLLP-SLP in order to determine which items and/or subtests are most predictive of speech or language disorders for these populations, if any. However, it remains that this screening tool is a necessary first step to providing an assessment tool created by and for bilingual SLPs who must assess children living in linguistic minorities. Given the strict administration protocol, it has the added value of allowing recommendations to be made to teachers and parents with respect to their student/child's speech and language abilities upon entry to kindergarten. Preliminary results pertaining to construct validity and internal consistency suggest that correlations between test items and the vocabulary composite score—which is the sum of three subtests (i.e. common nouns, actions words, and modifiers)—were significant, but weak in the areas of WH-questions and oral directions. All correlations between subtest scores and the vocabulary composite scores were moderate to high ( $r_G = .54-.99$ ) as were correlations between subtest scores and composite language score—which is the sum of all subtests related to language (WH-questions, two-step directions, spatial concepts, categorization, body parts, common nouns, action words, and modifiers) ( $r_G = .65-.90$ ). In fact, there were no weak correlations between the subtest scores and the language composite scores with one moderate correlation and eight high correlations. Given the extensive number of correlations generated, alpha was set at .001 to help control for spurious significance. Percent agreement exceeded 80 percent on forty-two of forty-six test items on interrater reliability measures. There was a statistically significant difference on five items: *who* (percent agreement: 93.24;  $Q = 12$ ;  $p < .05$ ), *why* (percent agreement: 77.46;  $Q = 10.32$ ;  $p < .05$ ), *take the book and close your eyes* (percent agreement: 97.26;  $Q = 26.75$ ;  $p < .05$ ), */s/* (percent agreement: 64.71;  $Q = 36.14$ ;  $p < .05$ ) and */z/* (percent agreement: 70.15;  $Q = 2.94$ ;  $p < .05$ ). Whenever differences in results were greater than or equal to .05, they were attributed to chance. As for test-retest reliability, Gamma was privileged over Kendall, Spearman, or Pearson and a McNemar's statistic was used.

There was perfect agreement on forty-three of a total of forty-seven analyses. The difference was not statistically significant for the remainder of the items: *why* ( $p = .50$ ), *cup* ( $p = .25$ ), */s/* ( $p = .25$ ) and */f/* ( $p = 1.00$ ). Whenever differences in results were greater than or equal to .05, they were attributed to chance.

Future research could also include administration of the PLLP-SLP in an English-language setting as well as a French-immersion setting designed for monolingual English speakers to learn French. This would allow us to compare results across populations and Canada's two official languages.

## Conclusion

Language varies for young children, especially those in linguistic minorities. Standardization studies aim to establish rules of administration that reduce, as much as possible, the impact of the human subjectivity on testing. This study aimed to standardize the PLLP-SLP, a speech and language tool used to assess speech and language among children entering kindergarten, as well as to provide norms by which to compare individual performance to that of one's peers. Unfortunately, common practice is to assess francophones and anglophones using the same measures and cutoff scores; the same holds true for girls and boys. Norms with respect to language and gender should be created as the results of this study demonstrated significant differences in means upon entry to kindergarten. The PLLP-SLP has now been standardized on a linguistic minority population. Consequently, SLPs within francophone minorities can now implement a universal systematic screening procedure for children entering junior kindergarten (i.e. upon school entry, when they are aged three years ten months to four years ten months). This will allow educators to benchmark student data for further intervention, using appropriate cutoff scores as they pertain to gender and dominant language.

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## Appendix A

### *List of Questions and Test Items by Subtest*

WH-Questions—Student answers the following questions:

Where: Where do you live?  
Who: Who bought your shoes?  
Why: Why do you brush your teeth?  
Whose: Whose shirt is this?

Categories (Prompt: Show me all the...)

animals  
clothes  
toys  
food

Spatial Concepts (Prompt: Place this eraser \_\_\_ the box.)

under  
in front of  
on  
beside  
in

Body Parts (Prompt: Show me...)

neck  
foot  
hand  
leg  
ear  
back  
mouth  
thumb

Oral Directions—Student does the following:

Stand up and touch your nose.  
Take the book and close your eyes.  
Sit down and grab the pencil.  
Take the box and shake it.

Vocabulary

Common Nouns (Prompt: “What is this...?”)

duck  
orange  
leaf  
ladder  
train

Modifiers (Prompt: A mouse is small; an elephant is \_\_\_\_.)

big  
cold  
closed  
dirty

Action words (Prompt: “What is she doing?”)

eat(ing)  
cry(ing)  
wash(ing)  
drink(ing)  
fall(ing)  
run(ning)

**Appendix B**

Speech Sounds Targeted in Initial Position, By Language	
English speech sounds targeted in initial position only	French speech sounds targeted in initial position only
[p]	[p]
[t]	[t]
[k]	[k]
[b]	[b]
[d]	[d]
[g]	[g]
[f]	[f]
[s]	[s]
[ʃ]	[ʃ]
[v]	[v]
[z]	[z]
[dʒ]	[ʒ]
[m]	[m]
[n]	[n]
[R]	[ʁ][r]
[l]	[l]

## ABOUT THE AUTHORS

**Dr. Michèle Minor-Corriveau:** Associate Professor, School of Speech-Language Pathology, Laurentian University, Sudbury, Ontario, Canada

**Dr. Chantal Mayer-Crittenden:** Associate Professor, School of Speech-Language Pathology, Laurentian University, Sudbury, Ontario, Canada

**Dr. Roxanne Bélanger:** Assistant Professor, School of Speech-Language Pathology, Laurentian University, Sudbury, Ontario, Canada

**Dr. Manon Robillard:** Associate Professor, School of Speech-Language Pathology, Laurentian University, Sudbury, Ontario, Canada

**Dr. Simon Laflamme:** Professor, PhD in Human Studies, Laurentian University, Sudbury, Ontario, Canada

**Dr. Ali Reguigui:** Professor, French Studies Department, Laurentian University, Sudbury, Ontario, Canada

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