

## **Nonword Repetition and Sentence Imitation as Clinical Markers for Primary Language Impairment in bilingual French-English- and English-French-speaking children in Northern Ontario: A Narrative Review**

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## Abstract

Studies indicate that nonword repetition and sentence imitation are useful tools when assessing bilingual children. Bilingual children with primary language impairment (PLI) typically score lower on these two tasks than their typically developing counterparts. Studies show that bilingual children are not disadvantaged during nonword repetition if they have limited language exposure. However, since sentence imitation tasks are constructed with words from the target language, it is expected that it would be more influenced by previous language exposure. The goal of this article will be to review the influence of bilingual exposure on both tasks. This review provides the theoretical background for future studies that will compare the accuracy of both tasks when identifying PLI in bilingual children.

**Keywords:** Nonword repetition, sentence imitation, bilingualism, clinical marker, language impairment, school-aged children, minority language.

## Résumé

Les études indiquent que la répétition de non-mots et l'imitation de phrases sont des outils utiles pour évaluer les enfants bilingues. Les enfants bilingues ayant une déficience en langue primaire (PLI) sont généralement inférieurs à ces deux tâches que leurs homologues en développement. Des études montrent que les enfants bilingues ne sont pas désavantagés pendant la répétition sans mot-clé s'ils ont une exposition limitée aux langues. Cependant, étant donné que les tâches d'imitation de phrase sont construites avec des mots de la langue cible, on s'attend à ce qu'elle soit davantage influencée par l'exposition antérieure à la langue. L'objectif de cet article sera d'examiner l'influence de l'exposition bilingue sur les deux tâches. Cette revue fournit les antécédents théoriques pour les études futures qui vont comparer l'exactitude des deux tâches lors de l'identification de PLI chez les enfants bilingues.

**Mots-clés:** Répétition de non-mots, imitation de phrase, bilinguisme, marque clinique, déficience linguistique, enfants d'âge scolaire, langue minoritaire.

Bilingual children with primary language impairment (PLI) are often missed or misdiagnosed (e.g. Paradis et al., 2011, Grimm & Schulz, 2013) and are therefore at a higher risk of academic failure (Genesee, 2004). This stems from the fact that difficulties and errors experienced by second language learners without PLI and those experienced by bilingual children with PLI can be very similar (Grüter, 2005; Håkansson, 2001; Paradis et al., 2008). Consequently, it can be a challenging task for speech-language pathologists to accurately assess bilingual children because some assessments may not accurately differentiate scores obtained by a typically developing child learning a second language presenting language delays from a child with PLI. Misdiagnoses could potentially lead to inappropriate or unnecessary interventions. The goal of this article is to review the scientific literature regarding the accuracy of two tasks used to screen PLI in bilingual children: nonword repetition and sentence imitation.

This paper focuses on French-English-speaking (children with French as their dominant language) and English-French-speaking (children with English as their dominant language) children residing in French minority communities found in Northern Ontario. In these communities, a large population of English-speaking children attend French-medium, non-immersion schools to learn French as their second language (Landry, Allard, & Deveau, 2010; Mayer-Crittenden, Thordardottir, Robillard, Bélanger, & Minor-Corriveau, under review). Studies show that children living in Northern Ontario are more often exposed to English in comparison to French while performing daily activities such as watching television, visiting websites and reading various materials (Laflamme & Bernier, 1998). In addition, children converse with one another in English in hallways and in schoolyards despite attending a French-language school (Landry et al., 2010; Simard & Mayer-Crittenden, 2015). Thus, the dominating presence of the English language in children's surroundings limits their opportunities to be exposed to the French language outside of their classroom setting.

According to Garcia, Paradis, Sénécal, & Laroche (2006), there is a lack of French assessment tools normalized in regions where French is the minority language. These authors recommend that test development and normalization occur with the said population rather than adapting pre existing tests. However, due to a lack of such tools, in Northern Ontario, speech-language pathologists (SLPs) often use different subtests from assessments normalized in another language or in a French majority context (i.e. France) or even create their own informal tools to evaluate children requiring a complete assessment (CSPGNO, 2004-2014; Mayer-Crittenden et al., under review). Kohnert (2013) explains that normative databases incorporating varying linguistic experiences and influences, as well as both known languages do not exist in any group of bilinguals. However, it is important to have a baseline measure of linguistic abilities of children who come from a similar linguistic background. Therefore, a battery of regionally normed tests allowing SLPs in Northern Ontario to accurately identify PLI in bilingual children in French and in English is warranted.

Children with PLI make up approximately 7% of kindergarten children (Tomblin, Records, Buckwalter, Zhang, Smith, & O'Brien, 1997). They present difficulties in language learning with very subtle cognitive shortfalls (Tomblin, Zhang, Buckwalter, & O'Brien, 2003). The identification of PLI in monolingual children can be challenging; it is twofold when identifying PLI in bilingual children living in a linguistic minority setting. The underlying source of language development delays in bilingual children may be a result of PLI. However, if the source is in fact PLI, the language difficulties will be observed in both languages (e.g Kan & Kohnert, 2005; Kohnert, 2002; Kohnert & Danahy, 2007; Kohnert, Windsor, Danahy Ebert, 2009). On the contrary, language delays may also be due to a difficulty learning language

because of inadequate exposure to the target language and limited knowledge of words in the target language (Kohnert, 2010). In these instances, the language difficulties are only present in the non dominant language. However, it should be noted that typically developing bilingual children often do not score as well as their typically developing monolingual counterparts on standardized language measures. Lower performance levels obtained by bilingual children may be due to distributed characteristic of bilingual learning across both languages, such as lexical knowledge (Oller & Pearson, 2002). Therefore, if only one language is taken into consideration, bilingual children show a smaller vocabulary size in comparison to monolingual children; however, when all languages known by a bilingual child are considered, the vocabulary size is comparable to their monolingual peers (Hoff, Core, Place, Rumiche, Señor, & Para, 2012). Since many traditional standardized language measures are typically dependent of language knowledge (Campbell, Dollaghan, Needleman, & Janosky, 1997), bilingual children may be disadvantaged if they have limited exposure to the language of testing (Restrepo & Silverman, 2001). For this reason, certain standardized language assessments used to screen PLI in monolingual children may not be appropriate for bilingual children. Therefore, researchers have been resorting to processing or working memory measures in order to avoid this bias.

Research shows that nonword repetition, a working memory task, is a useful tool when evaluating bilingual children. Extensive studies conducted in many different languages support nonword repetition as a clinical marker when identifying PLI in monolingual children with many different languages as their dominant language: French (Thordardottir & Brandeker, 2012), Icelandic (Thordardottir, 2008), Italian (Casalini et al., 2007; Dispaldro, Leonard & Deevy, 2013), Russian (Kavitskaya, Babyonyshev, Walls, & Grigorenko, 2011), Spanish (Girbau & Schwartz, 2007), and Swedish (Sahlén, Reuterskiöld-Wagner, Nettelblatt, & Radeborg, 1999). However, findings are mixed. For example, Kohnert et al. (2006) conducted a study on nonword repetition and results did not show that nonword repetition as a good indicator of PLI in bilingual children. Yet, children who obtained a nonword repetition score of 93 percent or higher could be successfully ruled out of the PLI group. In addition, it is possible that the particular NWRT used in Kohnert et al.'s (2006) study contained language-specific factors, which would disadvantage children with less exposure to the target language. When completing nonword repetition tasks, children with PLI show deficits that are not connected to the varying levels of language knowledge (Dollaghan & Campbell, 1998). Nonword repetition involves the repetition of items that do not exist in the target language, thus, repeating words that have not been heard beforehand. For this reason, it is expected that children cannot draw from stored language knowledge. Thus, bilingual children with varying exposure levels are not put at a disadvantage because nonword repetition is less dependent on language knowledge, such as syntax and vocabulary. It also draws primarily from phonological processing and short-term memory.

A nonword repetition framework, Crosslinguistic Nonword Repetition Tasks: British English Version (CNWRT: British English Version) was created by Chiat (2015) and was intended to be used across languages. This particular framework aimed to reduce pitfalls when identifying PLI in bilingual children. A previous study conducted by Dubreuil-Piché (2016) examined and adapted the CNWRT: British English Version in order for it to be used to identify PLI in bilingual children residing in Northern Ontario. This study used three tasks to identify PLI in Canadian French-English and English-French speaking children: the quasi-universal task with quasi-neutral prosody, the quasi-universal task with language-specific prosody and the language-specific (LS) task. The nonwords were recorded digitally and imported onto an electronic tablet using an interactive PowerPoint presentation created by Polišenská & Kapalkova (2014).

Preliminary results indicated that the adapted French-Canadian Nonword Repetition Task (Mayer-Crittenden, Reguigui, & Dubreuil-Piché, 2016) accurately differentiated typically developing bilingual children from bilingual children with PLI: all three nonword repetition tasks were able to discriminate performances between both groups and were minimally affected by varying levels of bilingualism.

Studies also show that sentence imitation can be an efficient tool for the identification of PLI in bilingual children (Archibald & Joanisse, 2009; Thordardottir & Brandeker, 2012). Sentence imitation tasks involve listening and immediately repeating sentences that increase in length and complexity one at a time, without changing the words, the meaning of the sentences (syntax) or the inflexions (Wiig, Semel, & Secord, 2009; Wiig, Semel, & Secord, 2013). The difficulty to repeat such sentences is a clinical marker of PLI (Wiig et al., 2009). However, studies show mixed findings in regards to the influence of existing knowledge of the target language when repeating sentences.

Some studies demonstrate that sentence imitation is highly linked to the existing knowledge to the target language (Eadie, Fey, Douglas, & Parsons, 2002; Oetting, McDonald, Seidel, Hegarty, 2015; Klem, Melby-Lervåg, Hagvet, Lyster, Gustafsson, & Hulme, 2014) Second language learners were disadvantaged during the sentence imitation tasks. Consequently, bilingual children with PLI would also be at disadvantage. Conversely, other studies indicate that existing knowledge to the target language does not impact the performance during sentence imitation tasks (Thordardottir & Brandeker, 2012; Seef-Gabriel, Chiat & Dodd, 2010). These studies demonstrate the effectiveness of the sentence imitation task in the identification of PLI as the task is not influenced by language knowledge. Bilingual second language learners perform well on the sentence imitation task, nevertheless, bilingual children with PLI continue to have more difficulties than typically developing children. It has been documented that morphosyntactic knowledge influences sentence imitation and that function word errors are more frequently produced by children with PLI (Seef-Gabriel et al., 2010). Difficulty with function words is a marker for PLI in English, thus supporting the use of sentence imitation tasks when identifying children at risk of PLI (Seef-Gabriel et al., 2010).

A study completed by Thordardottir and Brandeker (2012) examined the diagnostic accuracy of the English and French nonword repetition and sentence imitation tasks in monolingual and bilingual children. The results of the study suggest that both tasks were successful when identifying PLI in monolingual and bilingual children. Furthermore, both tasks were minimally affected by ranging levels of previous exposure in typically developing bilingual children.

To compare the accuracy of a nonword repetition task and a sentence imitation task as a clinical marker of PLI and to examine the influence of previous language exposure in bilingual French-English and English-French speaking children of Northern Ontario, the Recalling Sentences subtest in the Clinical Evaluation of Language Fundamentals Fifth Edition (CELF-5) (Wiig et al., 2013) and its equal French counterpart from the version for francophone Canadians (CELF CDN-FR) (Wiig et al., 2009) consist of the sentence imitation tasks that should be used when screening for PLI. The nonword repetition task that should be used is the quasi-universal task intended to be used across languages developed by Mayer-Crittenden et al. (2016). Thordardottir and Brandeker (2012) used an English and a French nonword repetition task to assess the participants' ability to repeat nonwords. Based on previous studies conducted on both nonword repetition (Boerma, Chiat, Leseman, Timmermeister, Wijnen, et al., 2015; Dubreuil-Piché, 2016; Thordardottir & Brandeker, 2012) and sentence imitation tasks (Conti-Ramsden,

Botting, & Faragher, 2001; Seef-Gabriel et al., 2010; Thordardottir & Brandeker, 2012), both tasks should accurately identify PLI in bilingual children. However, the French-Canadian quasi-universal nonword repetition task (Mayer-Crittenden, 2016) should be the most discriminating marker of PLI out of the two, based on the results of the study completed by Thordardottir and Brandeker (2012).

In order to complete such a study, a representative sample of French-English and English-French speaking five- and six-year old bilingual children should be recruited. It is important to note that bilingual children should be compared to bilingual children; in this case, it would be the comparison of bilingual children with and without PLI. Each participant would complete both the quasi-universal nonword repetition and the sentence imitation tasks in French and in English. If results were to be in line with the predictions made, both tasks could serve as a diagnostic tool for clinicians identifying PLI in bilingual children with varying levels of bilingualism living in a linguistic minority community. Typically developing bilingual children should outperform bilingual children with PLI despite varying levels of exposure to the minority language, French. Nonword repetition and sentence imitation are time-efficient and easy to complete, which makes them ideal to use in a clinical setting. Thus, once findings from such study determine the specificity and sensitivity of both tasks, SLPs would have regionally normalized tasks to screen for PLI in bilingual children.

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