The sentence repetition task: A powerful diagnostic tool for French children with specific language impairment

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ABSTRACT

This study assesses the diagnostic accuracy and construct validity of a sentence repetition task that is commonly used for the identification of French children with specific language impairment (SLI). Thirty-four school-aged children with a confirmed, diagnostically based diagnosis of SLI, and 34 control children matched on age and nonverbal abilities performed the sentence repetition task. Two general scoring measures took into account the verbatim repetition of the sentence and the number of words accurately repeated. Moreover, five other scoring measures were applied to their answers in order to separately take into account their respect of lexical items, functional items, syntax, verb morphology, and the general meaning of the sentence. Results show good to high levels of sensitivity and specificity at the three cut-off points for all scoring measures. A principal component analysis revealed two factors. Scoring measures for the respect of functional words, syntax and verb morphology provided the largest loadings to the first factor, while scoring measures for the respect of lexical words and general semantics provided the largest loadings to the second factor. Sentence repetition appears to be a valuable tool to identify SLI in French children, and the ability to repeat sentences correctly is supported by two factors: a morphosyntactic factor and a lexical factor.

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1. Introduction

Diagnosing language impairment is a complex endeavor. Some tasks are considered to be useful tools for identifying children with specific language impairment (SLI), given that these children consistently perform at a lower level than their chronological age- (or even language age-) matched peers. These tasks include finite verb morphology (e.g., Conti-Ramsden, 2003; Oetting & McDonald, 2001; Rice & Wexler, 1996), nonword repetition and sentence repetition (e.g., Archibald & Joanisse, 2009; Conti-Ramsden, Botting, & Faragher, 2001; Stokes, Wong, Fletcher, & Leonard, 2006). Among them, sentence repetition is the most useful clinical marker of SLI in the English language, with high levels of overall accuracy (88%), specificity (85%) and sensitivity (90%) (Conti-Ramsden et al., 2001) even when language difficulties are associated with working memory impairments (Archibald & Joanisse, 2009). In Cantonese, sentence repetition, but not nonword repetition, discriminates between children with SLI and their typically developing peers, with a specificity of 97% (Stokes et al., 2006).

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Sentence repetition has also proved to be a good clinical marker of SLI in young adults (Poll, Betz, & Miller, 2010). Moreover, sentence repetition could be specific to the kind of language difficulties encountered by children with SLI, as compared to other language-impaired children. Sentence repetition is indeed an efficient tool to differentiate children with SLI from children with language problems due to hearing loss (Briscoe, Bishop, & Norbury, 2001), resolved late talkers (Petruccelli, Bavin, & Bretherton, 2012) or children with an autism spectrum disorder without language problems (Taylor, Maybery, Grayndler, & Whitehouse, 2014).

Sentence repetition can thus be considered as a powerful clinical psycholinguistic marker of SLI. Consequently, this task is of particular interest for speech-language pathologists (SLPs) to diagnose SLI. However, only two French standardized test instruments commonly used by SLPs include such a task for school-age children: the NEEL battery for children between 4 and 8 years old (*Nouvelles Epreuves pour l'Examen du Langage*, Chevrie-Muller & Plaza, 2001), and the L2MA2 battery for children between 7 and 12 years old (*Langage Oral, Langage Ecrit, Mémoire et Attention* [2nd Edition], Chevrie-Muller, Maillart, Simon, & Fournier, 2010). Moreover, data related to their identification accuracy has not been reported to date. As far as we know, only one study assessed the identification accuracy of a sentence repetition task in French (Thordardottir et al., 2011). This task proved to be a sensitive (86%) and specific (92%) clinical marker of French 5-year-old children with SLI, confirming its potential power as a diagnostic tool in French, like it is in English. However, the task that Thordardottir and colleagues describe was adapted for the purpose of their study and is thus not available to French SLPs. In the present study, we assessed whether a diagnostic tool commonly used by French SLPs could be of particular interest for detecting language problems, and also if it could offer a first valid glimpse of the linguistic problems encountered by children with SLI.

1.1. Sentence repetition: a multi-determined task

Over and above the working memory resources recruited, performance on a sentence repetition task is highly dependent on linguistic abilities. When recalling sentences, long-term syntactic and semantic knowledge is recruited, enabling the binding of words into larger chunks, and the accurate recall of sentences whose length exceeds the subject's span (Allen & Baddeley, 2009). The significantly large dependence of this task on linguistic abilities was confirmed by Archibald and Joanisse (2009), who indicated a lower task sensitivity for children with working memory impairment than for language-impaired children.

Various studies showed that linguistic knowledge has a significant impact on sentence recall. Comparing sentence recall to that of word lists, Jefferies, Lambon Ralph and Baddeley (2004) classified error types as phonological, lexical, morphological, repetition and unrelated errors. They observed a larger amount of semantic substitutions and a lower amount of phonological errors during the recall of sentences, showing that semantic coding played a greater role, and phonological coding a lesser role, in this task as compared to word lists. Moreover, fewer order and morphological errors occurred when recalling sentences than when recalling word lists, revealing the impact of morphosyntactic knowledge on sentence retention. Finally, sentence repetition has been used to investigate morphosyntactic abilities both in typically developing and in language-impaired children (Christensen & Hansson, 2012; Komeili & Marshall, 2013). For example, Devescovi and Caselli (2007) showed that sentence repetition is a reliable measure of morphosyntactic development between 2 and 4 years of age, since it correlates with the mean length of utterance and mirrors the qualitative production pattern in spontaneous speech.

Morphological, syntactic, and lexical abilities have a significant impact on sentence repetition performances. Yet, many studies reported that children with SLI demonstrate significant difficulties in producing grammatical morphology (e.g., Conti-Ramsden, 2003; Oetting & McDonald, 2001; Rice & Wexler, 1996) and accurate (complex) sentence structure (e.g., Novogrodsky & Friedmann, 2006; Pizzioli & Schelstraete, 2008), as well as weaknesses in lexical-semantic processing (e.g., McGregor, Oleson, Bahnsen, & Duff, 2013). The reason why sentence repetition has proved to be especially challenging for children with SLI is probably because it heavily recruits many linguistic processing abilities that correspond to weaknesses in these children.

1.2. Construct validity

Construct validity is a measure's ability to accurately reflect what it was designed to measure. Given all the processes at play in sentence repetition, there is a 'potential of sentence repetition to investigate language profiles' (Riches, Loucas, Baird, Charman, & Simonoff, 2010, p. 48). Performances in sentence repetition are mainly affected by morphosyntactic and lexical-semantic abilities. If this task is well designed to diagnose linguistic problems in children with SLI, performances of this task should be significantly affected by the morphosyntactic abilities on the one hand, and the lexical-semantic abilities on the other hand. Such an investigation requires first, to differentiate performance scores depending on the kinds of errors children make, and second, to attest that these various performance scores are indeed measuring the abilities that they were designed to measure.

Most standardized tasks propose a correct/false scoring procedure for the complete sentence, leading to a loss of important qualitative information about linguistic errors (e.g., Redmond, 2005). The coding procedure could indeed be a key factor to take into account when considering the diagnostic power of a test. According to Riches and colleagues (2010), the coding for different kinds of errors has the best potential to identify differences in language phenotypes across different groups. In some tasks, the scoring procedure is somewhat more precise. For example, Archibald and Joanisse (2009), as well