

# The Comorbidity of ADHD and DLD in School-Aged Children: L2 Acquisition and the Types of Errors Produced

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## Abstract

The purpose of this study was to analyze the effects of the co-occurrence of developmental language disorder (DLD) and attention-deficit disorder with or without hyperactivity (ADHD) on language development and second language acquisition in a French minority setting. An unpublished non-word repetition task, as well as the Recalling Sentences subtests of the CELF-5 battery, were used to assess the children in both French and English. The data for this research comes from a longitudinal study. Fifteen participants were categorized into three different groups: a group of children with ADHD only (n=5), a group of children with DLD only (n=5) and a group of children with ADHD and DLD (n=5). The different language domains analyzed were verbal working memory and morphosyntactic knowledge. The results demonstrated that like DLD, ADHD may have an impact on certain language domains. Speech-language pathologists should be aware of the various types of errors produced by the different groups on these tasks in order to better understand the language profiles of each.

## Introduction

This study examined the comorbidity of ADHD and DLD in bilingual school-aged children from Northeastern Ontario, Canada. In the general population, 5-7% of children have ADHD (Stanford & Delage, 2020), 7% of children have DLD (Norbury et al., 2016; Tomblin et al., 1997) and 35% to 50% of children with ADHD also have DLD (Redmond, 2004). Since there is little research to date that focuses on the effects of the co-occurrence of DLD and ADHD on first language (L1) development and second language (L2) acquisition in a francophone minority environment, this study was a step forward in understanding the linguistic abilities of these children.

Research to date demonstrates that acquiring and maintaining a minority language can be difficult when exposure to that language is reduced (Gathercole et al., 2014). Additionally, there are researchers who suspect that the second language abilities of children with ADHD in linguistic minority contexts may be impaired, as they have difficulty sustaining attention and learning their first language (Frenette & Mayer-Crittenden, 2018).



## Method

Tests used were both the French and English versions of the Recalling Sentences subtest of the CELF-5 battery as well as an unpublished non-word repetition task in French. The data for this research comes from a longitudinal study and 15 participants (age: 8-9 year-olds) were categorized into three different groups matched for age, SES, gender, IQ and language dominance:

1. Bilingual children with ADHD (n=5);
2. Bilingual children with DLD (n=5);
3. Bilingual children with concurrent ADHD and DLD (n=5).

The participants were enrolled in French-medium schools but were minimally exposed to the French language outside of the classroom. In addition, the children had not yet received formal instruction in English.

## Results

For the non-word repetition tasks, the children in the ADHD + DLD group scored the lowest compared to the two other groups and those in the DLD group scored the highest (as shown in Table 1). Moreover, for sentence repetition, the types of errors produced by children in each group varied (as shown in Table 2). Differences were noted according to the language in which the test was administered.

French version of the Recalling Sentences test:

- DLD group: addition and transposition errors
- ADHD group: omissions, substitutions, segment modifications, errors in agreement of gender and number, verb tense errors and auxiliary errors.
- **ADHD group produced the most errors overall**

English version of the test

- DLD group: omissions, addition errors and segment modifications
- ADHD group: non-word substitutions and transposition errors
- ADHD + DLD: substitutions and errors in agreement of gender and number.
- **ADHD + DLD group produced the most errors overall.**

When results from the tests in both languages were combined, the **ADHD group produced the most errors.**



Table 1  
Results of Each Group in Percentages for the Non-Word Repetition Tasks.

Group	Quasi-Universal with prosody (words)	Quasi-Universal without prosody (phonemes)	Quasi-Universal without prosody (words)	Quasi-Universal without prosody (phonemes)	Language specific (words)	Language specific (phonemes)
DLD	83.8%	96.3%	78.8%	93.7%	62.5%	90.5%
ADHD	72.5%	93.9%	68.8%	91.2%	54.2%	87.1%
DLD + ADHD	66.3%	89.5%	63.8%	89.3%	45.8%	83.3%

Table 2  
Means of the Different Types of Errors from the CELF-5 Recalling Sentences Test Results of Both French and English Versions.

Language of test	French			English		
	DLD	ADHD	DLD + ADHD	DLD	ADHD	DLD + ADHD
Omissions	8.3	10.5	8.0	5.3	4.8	4.8
Non-word substitutions	0.8	3.5	1.0	0.3	1.3	0.6
Other substitutions	10.8	14.3	4.0	13.8	14.0	17.2
Additions	2.8	2.5	1.3	2.8	2.0	1.0
Transposition	1.5	0.8	0.3	0.5	1.8	0.6
Segment modification	0.5	0.8	0	1.3	0.3	0.4
Gender errors	4.5	6.0	1.7	N/A	N/A	N/A
Singular-plural errors	0.3	1.5	0.3	0.5	0	0.8
Verb tense errors	5.0	6.0	2.3	1.5	3.5	3.8
Auxiliary errors (être & avoir)	2.3	2.8	2.0	N/A	N/A	N/A
Non-repeated sentences	0	0.8	0.7	0	1.0	0.4

## Implications

The findings demonstrate that bilingual children with ADHD alone produced the most errors during the sentence repetition tasks and that those with comorbid ADHD and DLD had the lowest scores on the non-word repetition tasks. This seems to indicate that ADHD by itself may have a significant impact on language. From this study, the types of errors produced by children with each Dx varied depending on the language. Therefore, it is essential that speech language pathologists be aware of these errors. To conclude, more research needs to be conducted to further study the effects of ADHD on language and to compare the different types of errors that bilingual children produce in a French minority setting where exposure to the target language is scarce.

## References

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