Tracking Reading and Related Skills in Adolescents with Dyslexia Before (age 5) and After (ages 10-17) Diagnosis.

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Introduction:

- **Phonological deficits** are detected in a **majority of children and adolescents** [1, 2, 3] and are the **most frequently** observed among all the other deficits in adults with dyslexia [4].
- **Phonemic segmentation** measured before reading acquisition are later associated with **reading fluency** level [5].
- **Phonemic discrimination** seems to be impaired in individuals with dyslexia and **predict** later reading abilities [6, 7].
- **Long term follow-up** are needed to determined the supposed **intra-individual stability** of phonological deficits [8] and reading impairment [9] and to clarify the **causal relation** between **phonological deficits and reading levels**.
- Causes of **reading impairment** are strongly discussed in the literature but **phonological deficits** are often implicated as **one among others** causal factor for these difficulties.

Phonological skills assessed in this study:

Phonological segmentation

Refers to the ability to split a (pseudo-) word into phonological segments as in a phonemic deletion task.

Phonemic discrimination

Refers to the ability to discriminate between two phonemes differing in one phonemic features (e.g., place of articulation).

Phonological short-term memory (PSTM)

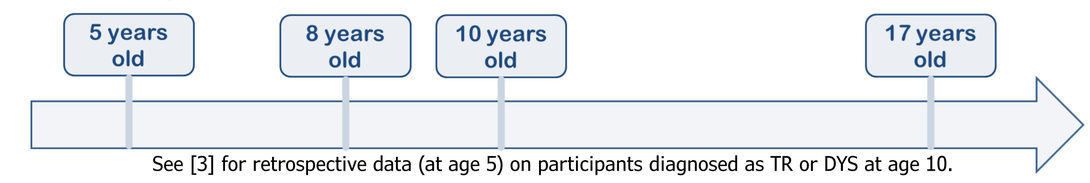
Refers to the ability to repeat pseudo-words (PW) of increasing lengths.

Method

Objective: The 12-years longitudinal follow up of individuals with dyslexia (DYS) & typical readers (TR) allow us to study phonological & reading impairments & to make causal assumption about the role of early phonological abilities on later reading fluency.

Participants: Participants enter the study at age 5 & were native French speakers, non-readers, & had at least average verbal & non-verbal IQs. 18 DYS & 20 TR were followed until age 17. At age 5, differences between two groups were unsignificant for age, verbal & nonverbal IQs.

Evaluation points:



See [3] for retrospective data (at age 5) on participants diagnosed as TR or DYS at age 10.

Phonological segmentation: A phonemic deletion task in which participants had to repeat the orally displayed PW without the first phoneme [10].

Phonemic discrimination: A similarity judgement between two bi-syllabic words and PWs differing on mode or place of articulation on the intervocalic consonant (ziné/zimé) [11] was used.

PSTM: The task used was a PW repetition task orally displayed. Items were increasing in length allowing to compute a span score [10].

Reading Fluency: The Alouette test [12] is a 265-words text with disruptive pictures and no predictive meaning. This test is well known to impinge compensation strategies of individuals with dyslexia.

Results

Reading level

DYS < TR
DYS ≈ TR

Skills	5	8	10	17
Reading level	✗	✗	✗	✗

Phonological impairments

DYS < TR
DYS ≈ TR

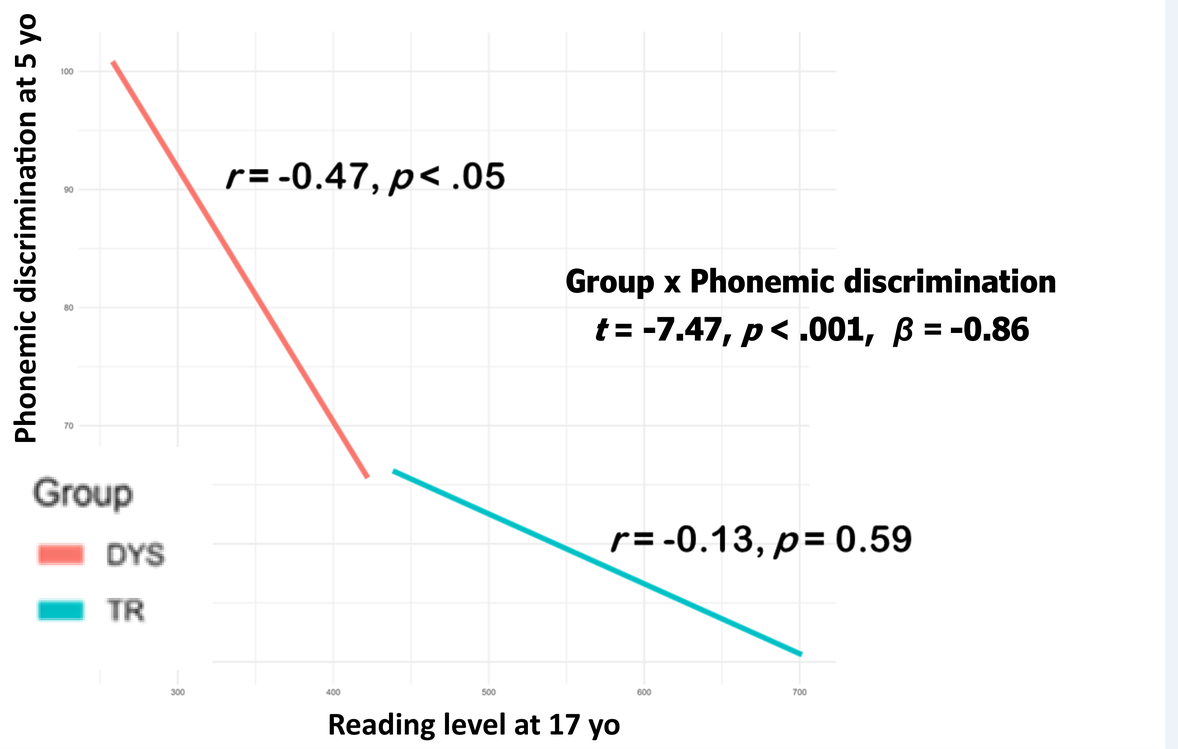
Skills	5	8	10	17
Phonological discrimination	✗			
Phonemic segmentation RT				✗
Phonemic segmentation Error %	✗	✗		≈
Phonological Short Term Memory Span			✗	✗

Correlation between pre-reading phonological abilities and reading fluency level at 17

	Phonemic discrimination at 5 yo	Phonemic segmentation at 5 yo
Reading level at 17	0.39*	-0.44**

Pearson's r coefficient and p-values (*: p<.05; **: p<.01)

Phonemic discrimination as an early predictors of reading fluency at 17 yo



Discussion

- **Pre-reading phonemic discrimination (5yo)** is impaired in future DYS compared to TR.
- **Phonemic segmentation** is significantly impaired in DYS on accuracy at 5 & 8 yo compared to TR. At 17, phonemic segmentation was impaired only regarding RT and not on accuracy (possible ceiling effect).
- **PSTM span** is significantly impaired at 10 and 17 for DYS compared to TR.
- **Phonemic segmentation** and **phonemic discrimination assessed before reading acquisition** (5yo) are correlated with reading fluency at 17yo.
- **Pre-reading phonemic discrimination** (5yo) is a **long term reading fluency predictor** (17yo) only in the DYS sample, this result is in continuity with other studies conclusions with children sample [6, 7]
- Early **phonemic discrimination impairment** could be the result of a **reduced sensitivity to phonological boundaries** in continuous speech [13] which is coherent with neurological evidence [14].
- The **causal hypothesis** that phonological impairment is one of the **core deficits** in **reading impairment** is verified in this sample.

Références

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