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.

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 insignificant for age, verbal & nonverbal IQs.

Evaluation points:

- **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.
- **Phonological segmentation**: The Alouette test [12] is a 265 words text with disruptive elements & to make causal assumption about the role of early phonological deficits & to make causal assumption about the role of early phonological deficits [8] and later reading abilities [6, 7].

Results

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

- **Phonemic discrimination**: Assessed before reading acquisition (5yo) are correlated with reading fluency at 17yo.

Discussion

- **Pre-reading phonemic discrimination (Syo)** 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 (Syo)** 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.