

# READING COMPREHENSION RESILIENCY GAINED THROUGH VOCABULARY AND LISTENING COMPREHENSION IS THREATENED BY LOW SOCIO-ECONOMIC STATUS IN ADOLESCENTS WITH AND WITHOUT DYSLEXIA.

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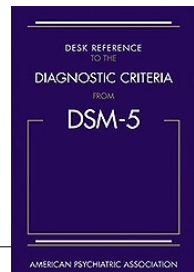


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1

## Developmental dyslexia

A specific learning disorder with a neuro-biological origin  
(*DSM-5, 2013*)



### With deficits on:

- Word decoding
- Reading fluency
- Spelling performance

### With exclusive factors:

- Without intellectual disability
- Motivation in learning to read
- With a correct social and educational environment to learn to read.

Theoretical introduction

Method

Results

Discussion

2

### Developmental dyslexia & Reading Comprehension

Unclear results from the literature

**Deficits on reading comprehension...**

- Pedersen, Fusaroli, Lauridsen, & Parrila, 2016
- Simmons & Singleton, 2000
- Snowling, Hayiou-Thomas, Nash, & Hulme, 2020

**Or at the same level as typical readers:**

- Cavalli, Colé, Brèthes, Lefèvre, Lascombe, & Velay., 2019
- Law, Veispak, Vanderauwera, & Ghesquière, 2018
- Law, Wouters, & Ghesquière, 2015
- Brèthes, Cavalli, Denis-Noël, Melmi, El Ahmadi, Bianco, & Colé, 2022

Reading comprehension achievement seems to be at risk in individuals with dyslexia and is not always found impaired.

Theoretical introduction

Method

Results

Discussion

3

### Hierarchy of the observed deficits of developmental dyslexia

Main etiological hypothesis →

Alternative or complementary etiological hypothesis

See the multi-deficit model offered by Pennington (2006, 2012)

Etiological deficits	⇒	Primary deficits	⇒	Secondary deficits
Phonological syndrome		Reading fluency		Reading comprehension
Visuo-attentional impairment		Word decoding		
Executive functions		Spelling		

Ramus et al., 2003; Vellutino et al., 2004

Lyon, Shaywitz, & Shaywitz, 2003

Fletcher, 2006; Vellutino et al., 2004

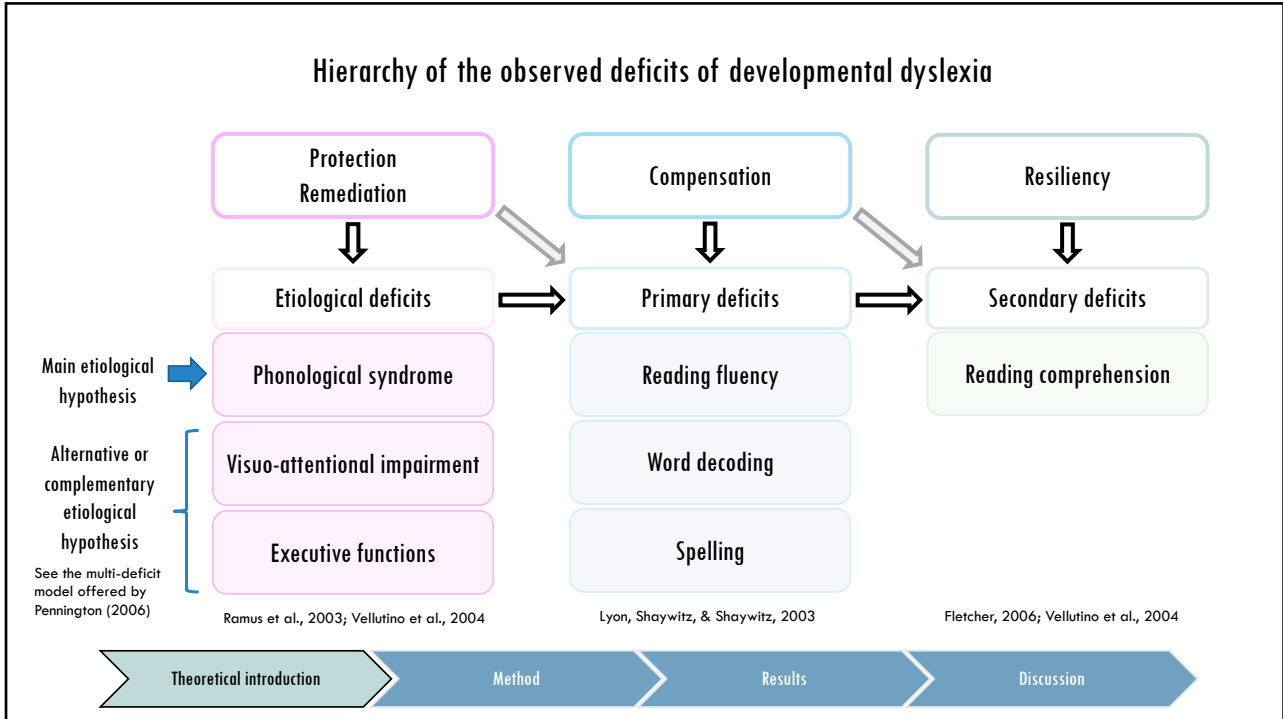
Theoretical introduction

Method

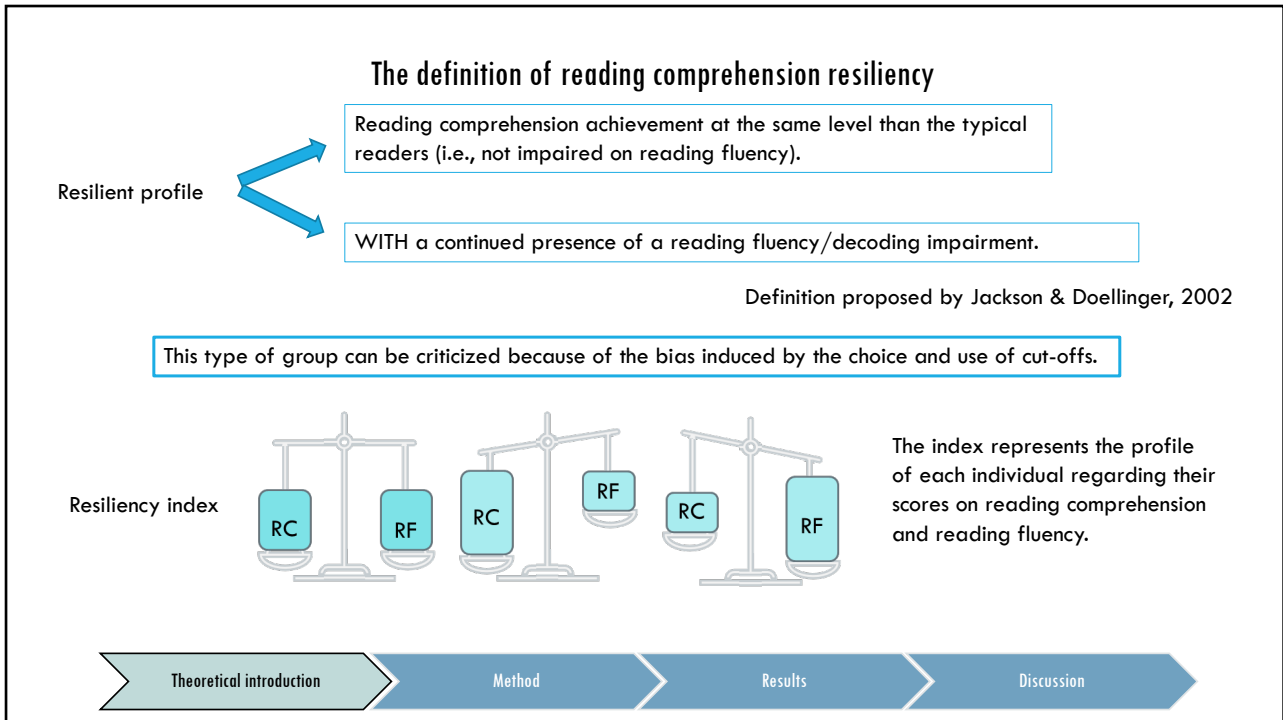
Results

Discussion

4



5



6

### Reading comprehension: from the simple view to a not so simple view

The simple view of reading (SVR) introduced by Gough & Tunmer (1986).

$$\text{Reading Comprehension} = \text{Language Comprehension} \times \text{Word Decoding}$$

The interplay of language comprehension and word decoding should explain the variation in reading comprehension scores.

And especially in the case of an individual with a specific impairment.

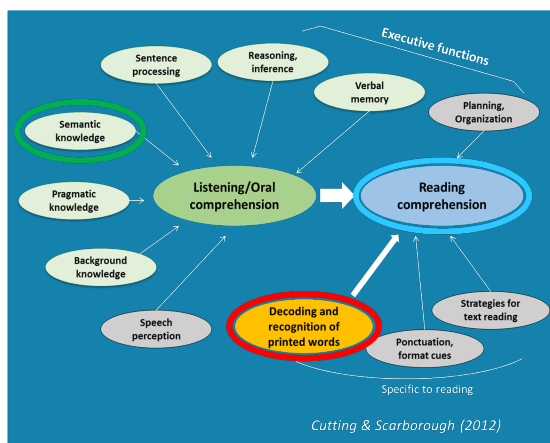
But first we must note that many studies argued to **precise** and **unpack** the principal components of reading comprehension.



7

### Reading comprehension: from the simple view to a not so simple view

Example of the extended version of the simple view of reading by Cutting & Scarborough (2012)



Major improvement:

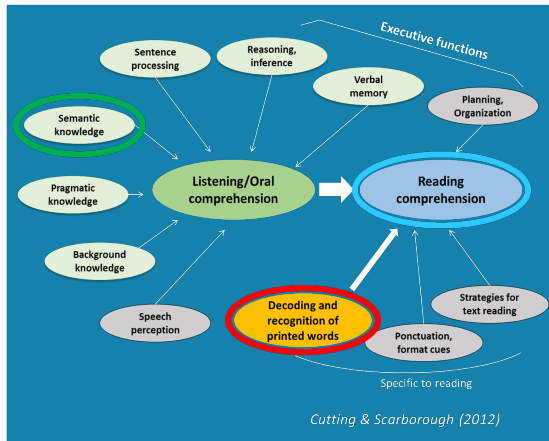
- Unpack the components of oral comprehension by offering several linguistic and domain general cognitive sub-components.



8

### Reading comprehension with dyslexia

Example of the extended version of the simple view of reading by Cutting & Scarborough (2012)



- The word recognition and reading fluency is persistently impaired and reading comprehension could be impaired by the cognitive weight of this impairment (Snowling et al., 2020).

**BUT**

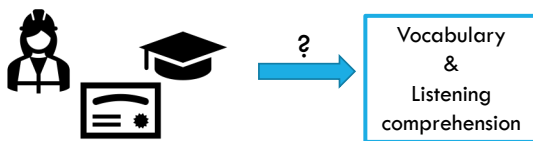
- Listening comprehension as well as vocabulary are preserved (Cavalli et al., 2016; de Oliveira et al., 2014).
- Language comprehension could be used to circumvent the word recognition and reading fluency deficits to achieve reading comprehension.
- This is called semantic bootstrapping mechanism (Muter & Snowling, 2009).
- The few studies on reading comprehension resiliency showed the importance of the **semantic skills** (Binder et al., 2007; Jackson & Doellinger, 2002; Welcome et al., 2009; Welcome et al., 2011; Farris et al., 2021).



9

### Influence of SES on Semantic skills

- SES is described as a combination of income, occupation types and education years (Baker, 2014).
- SES seems to have an impact on reading acquisition (Fluss et al., 2009) and modulates dyslexia behavioral expression in low SES status family (Bishop, 2015).



What is the influence of socio-economic level on semantic skills?

- Children from lower SES may benefit from less frequent and lower quality early verbal interaction with caregivers than their more advantaged peers (Hart & Risley, 1995; Korat, et al., 2007).
- These differences in the oral language environment are thought to account for the observed associations between low SES and reduced language ability, including vocabulary and verbal reasoning skills (Beitchman et al., 2008; Hart & Risley, 1995).



10

### Objective & Hypotheses of the study

The **general goal of this study** is to understand the relation between **SES** and **reading comprehension resiliency** through semantic skills, especially **vocabulary** and **listening comprehension**.

1. We make the hypothesis that reading comprehension resiliency will be more pronounced in individuals with dyslexia compared to typical readers.
2. According to the literature, we expect that listening comprehension and vocabulary scores will be link to reading comprehension resiliency, specifically we aim to test, with a mediation model, the extended model of reading comprehension where vocabulary predicts listening comprehension which then predicts reading comprehension.
3. In a second part of the mediation model, we aim to test the influence of SES on vocabulary and listening comprehension.



If these hypotheses are verified, we could say that semantic skills are especially important to develop reading comprehension resiliency and that the SES level has a particularly strong influence on the reading comprehension achievement in the population of individuals with dyslexia.







11

### Participants

- 95 French adolescents with average age of 16 years (Grade 10 = 42; Grade 11 = 37; Grade 9 = 5)
- 56 adolescents with dyslexia (F = 31; M = 25)
- 39 adolescents without dyslexia (F = 30; M = 9)
- None of the participants suffered from a previous head injury, presented hearing deficits or non-corrected visual deficits.
- None of the participants presented a score below the fifth percentile on non-verbal reasoning (Matrix), vocabulary and similarities of the WISC-5 sub-test.

 DYS < TR; significantly different  
 DYS ≈ TR; paired

Variables	Comparisons results
Age	
Phonemic awareness ACC	
Phonemic awareness TR	
Non-verbal reasoning	

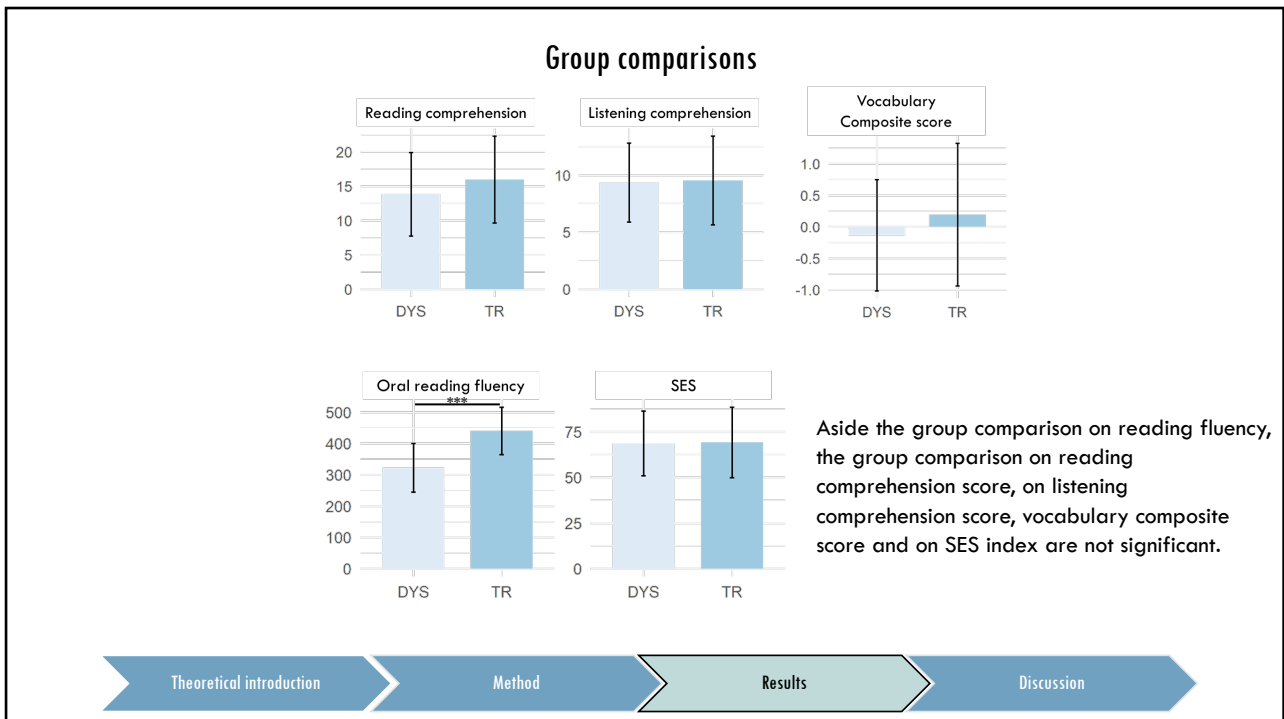


12

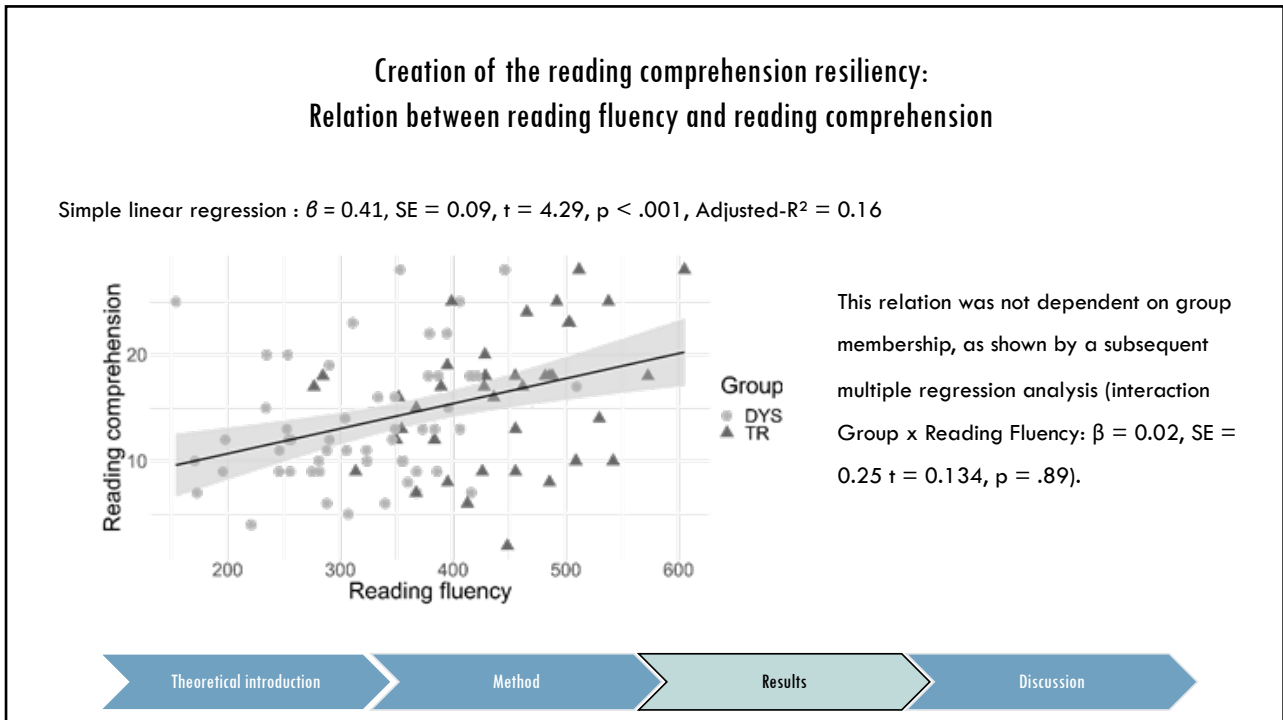
### Materials

Skills	Test used
Vocabulary	<b>Vocabulary &amp; Similarities</b> WISC-5
Family SES	<b>Hollingshead Index</b> (1975) adapted to the French job and school system, made of parent's level of education and occupation.
Reading Fluency	The <b>Alouette test</b> (Lefavrais, 1965)
Listening comprehension	A story to listen to followed by questions asked by the experimenter (Brêthes et al., 2022).
Reading comprehension	3 texts (newspaper articles) to read in a self paced manner. Questions were presented in MCQ or open-ended questions and were asked by the experimenter (Brêthes et al., 2022).

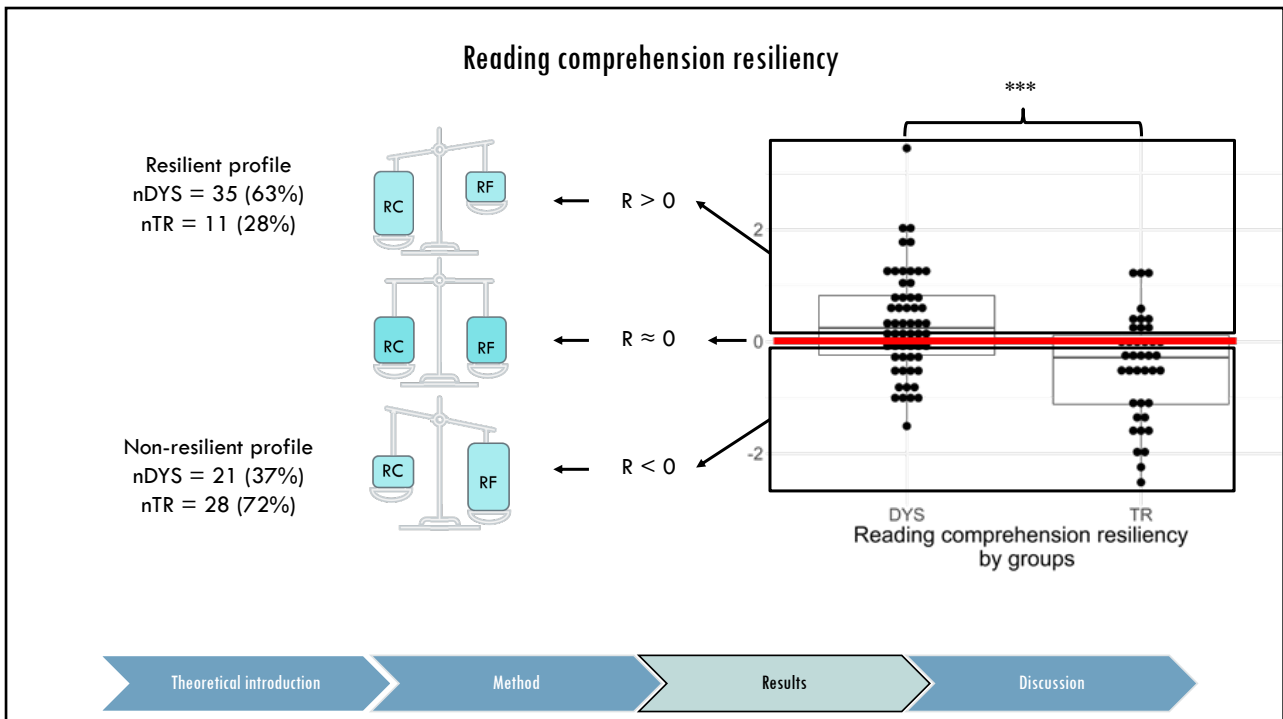
13



14

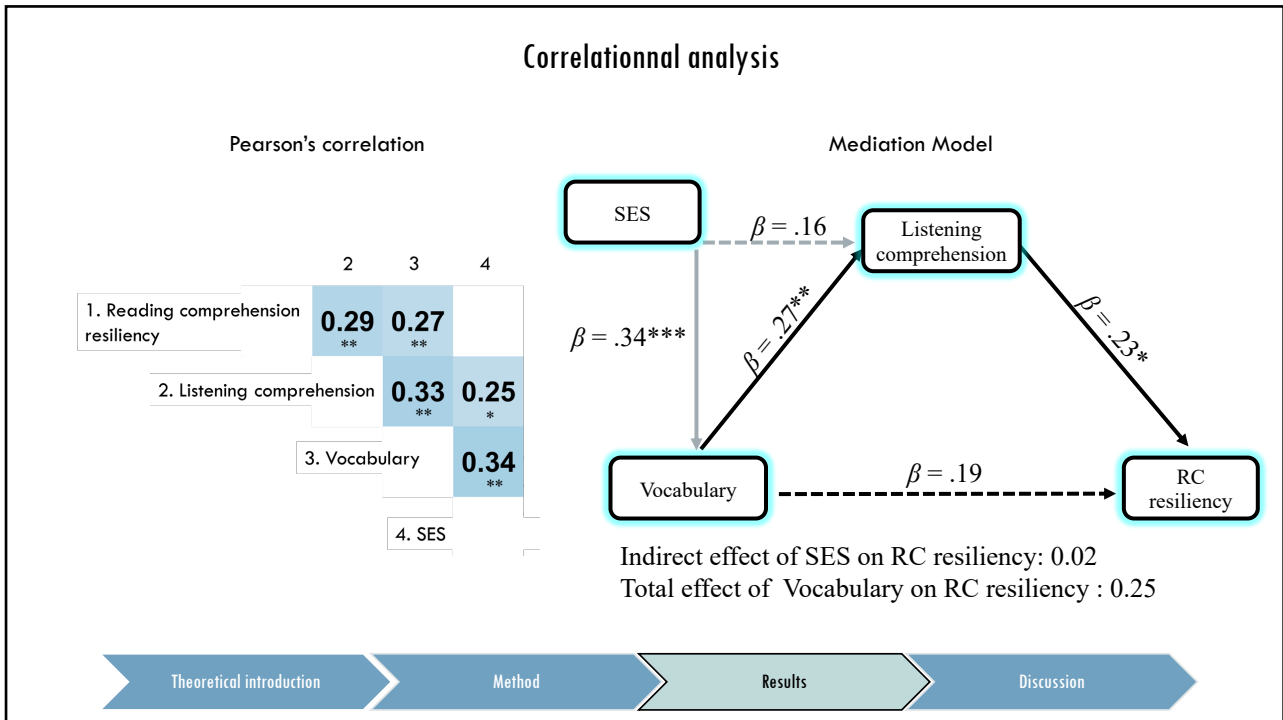


15



16





17

### Summary of the results

- We make the hypothesis that reading comprehension resiliency will be more pronounced in individuals with dyslexia compared to typical readers. Confirmed

  - Reading fluency is still impaired in adolescents with dyslexia.
  - In average, reading comprehension, vocabulary and listening comprehension of adolescents with dyslexia is not different in comparison with typical readers.
    - ➡ Confirm that reading comprehension is a secondary deficits.
- According to the literature, we expect that listening comprehension and vocabulary scores will be link to reading comprehension resiliency, specifically we aim to test, with a mediation model, the extended model of reading comprehension where vocabulary predict listening comprehension which then predict reading comprehension. Confirmed

  - Reading comprehension resiliency is linked to semantic skills as listening comprehension and vocabulary in a sample of adolescents. The direct link between vocabulary and reading comprehension resiliency is totally mediated by the indirect link passing through listening comprehension.

Theoretical introduction → Method → Results → Discussion

18

## Summary of the results

3. In a second part of the mediation model, we aim to test the influence of SES on vocabulary and listening comprehension.

Confirmed

- SES is indirectly linked to reading comprehension resiliency through vocabulary and listening comprehension.
- Our study confirm the link described in the literature between vocabulary development and SES.

Reading comprehension resiliency, a profile especially presented by individuals with dyslexia, is predicted by semantic skills as vocabulary and listening comprehension.  
These same semantic skills are linked to the SES level of the family of the participants.

Theoretical introduction

Method

Results

Discussion

19

## Perspectives & Conclusions

- The familial SES is an environmental factor that must be addressed in assessment and educational policy in order to mitigate social inequality.
- Because reading comprehension resiliency is especially prominent in individuals with dyslexia, low SES might be considered an additional risk factor in this population, as it might hinder the reading comprehension of dyslexic readers.

Two types of intervention:

- Early evidence-based intervention on caregivers interaction towards their children to enhance linguistic development (Leung, Hernandez, and Suskind, 2020).
- Evidence-based programs towards school-aged children, in order to increase semantic knowledge and especially vocabulary depth (for example Potocki, Chailleux, Gimenes, & Pylouster, 2021).

To conclude, SES has an indirect impact on the behavioral manifestation of individuals with dyslexia achievement but is rarely considered. The SES level should be considered as a variable of interest in future studies on dyslexia compensation and resiliency.

Theoretical introduction

Method

Results

Discussion

20

Thank you for your attention!

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Theoretical introduction

Method

Results

Discussion

21

### Calcul du niveau SES Hollingshead (1975)

$$\text{SES Index} = (\text{PO} \times 7) + (\text{PE} \times 4)$$

PO = Professional occupation  
(maximum des 2 parents)

PE = niveau d'éducation parentale  
(moyenne des deux si les 2 parents  
sont dans la vie de l'enfant: parents  
toujours ensemble, garde alternée,  
garde partagée.  
Cas contraire uniquement celui du  
parent qui a la garde).

Formule utilisée par Demir-Lira,  
Prado, and Booth (2016)

**Point(s)  
alloué(s)**

1 Moins que l'école  
obligatoire (<Brevet)

2 Ecole obligatoire (Brevet)

3 Apprentissage (CAP)

4 Ecole professionnelle

5 Baccalauréat

6 Formation professionnelle  
supérieure (Licence Pro,  
BTS, DUT...)

7 Diplôme universitaires,  
Hautes Ecoles

Catégories d'éducation et d'occupation  
professionnelle tiré de Genoud, 2011;  
Université de Fribourg

**Point(s)  
alloué(s)**

1 Ouvriers et employés non-  
qualifiés

2 Conducteurs de machines

3 Artisans et ouvriers

4 Agriculteurs & Pêcheurs

5 Personnels de services et  
de la vente

6 Employés de type  
administratif

7 Professions intermédiaires

8 Professions intellectuelles et  
scientifiques

9 Dirigeants, cadre supérieur,  
cadre de direction

23