

Language proficiency and study achievement of dyslexic children enrolled in immersion education

C. Parmentier¹, M. Simonis¹, L. Van Mensel², P. Hiligsmann¹, B. Galand¹, N. Lefèvre¹,
L. Ordonez Magro¹, A. Szmalec¹

¹ Psychological Sciences Research Institute, Université catholique de Louvain, Belgium

² Namur Institute of language, Text and Transmediality, Université de Namur, Belgium

Introduction

- To this day, only a few studies conducted on the appropriateness and the effectiveness of the immersion education method for children with learning disabilities, including dyslexia (i.e., de Bree & Unsworth, 2014; Kruk & Reynolds, 2012).
- The lack of empirical reliable evidence leaves room for personal beliefs and concerns expressed by education professionals and parents.
- Belgian context : *CLIL* (Content and language integrated learning) - the European type of immersion education
- The goal of the study :
 - (1) Identifying whether the prevalence of dyslexia is comparable between immersed and non-immersed pupils among +800 children and adolescents recruited in French-speaking Belgium (Hiligsmann et al., 2017).
 - (2) Assessing whether and how the expected adverse effects of dyslexia on the development of (a) linguistic and (b) literacy abilities as well as on (c) academic achievement may differ between immersed and non-immersed pupils.

Method

Participants

- 30 pupils with dyslexia identified in a sample of 800+ recruited in French-speaking Belgium (Hiligsmann et al., 2017) in the 5th or 11th school grade
- 30 matched typically developing controls (on instruction method, school grade, foreign language learned, SES, number of years in CLIL, non-verbal intelligence, receptive vocabulary in French)

18 CLIL pupils with dyslexia	18 CLIL control pupils
12 non-CLIL pupils with dyslexia	12 non-CLIL control pupils

Material

Background measures

- Non-verbal intelligence** *Raven*
- French receptive vocabulary** *EVIP* (PPVT's French adaptation)

L1 (French) Literacy

- Reading accuracy and reading speed**
Alouette-R: Reading of a meaningless 265-words text aloud consisting of French linguistic structures in less than 3 minutes.
- Spelling (errors)**
Chronosdictées (for the 5th school grade pupils): dictation of 5 sentences.
EVALAD (for the 11th school grade pupils): text dictation of 213 of words.

Foreign-language proficiency

- Receptive vocabulary**
PPVT-III-NL (for the Dutch learners) } untimed picture designation tasks
PPVT-IV (for the English learners) }

School achievement

- Average **school outcomes** at the Belgian official end-of-curriculum evaluations (*CEB/CESS*) shared by some schools (at the end of the 6th / 12th school grade of the participants).

Results

Prevalence of dyslexia in CLIL (French-speaking Belgium)

In the initial sample of 800+ pupils, the 30 pupils with dyslexia accounted for...

- 3.46 % in CLIL (4.8% in primary and 2.56% in secondary school)
 - 3.72 % in traditional education (5.3% in primary and 2.33% in secondary school)
- ... both proportions did not differ significantly ($\chi^2(1) = .040$, $p = .842$).

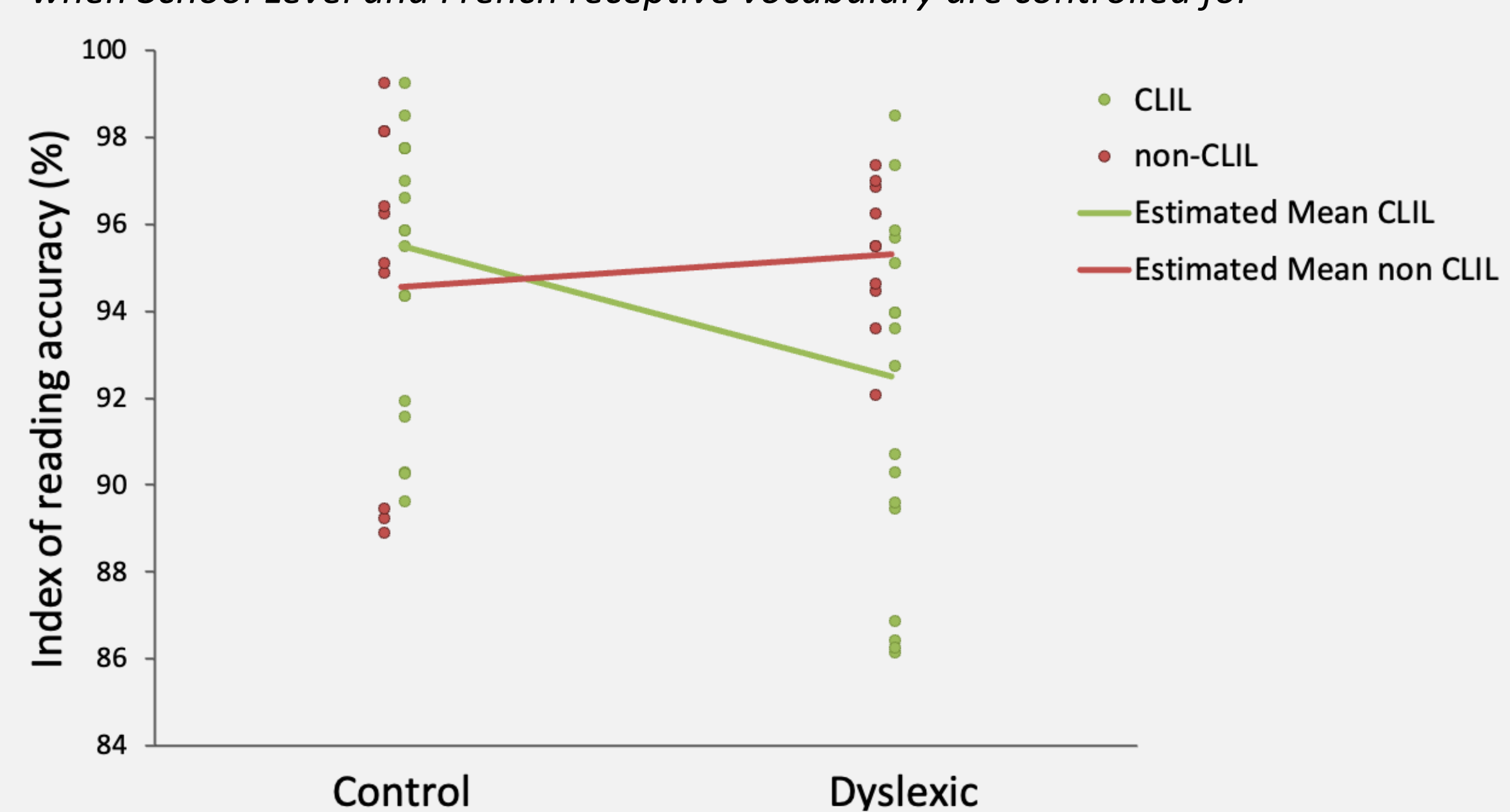
Table 1 Estimated marginal means (SD) per group and related mixed ANCOVAs results for literacy and FL proficiency tasks, and school outcomes controlling for background variables when necessary

	CLIL control	CLIL dyslexic	non-CLIL control	non-CLIL dyslexic	F Dyslexia	η^2_p	F Instruction Method	η^2_p	F Dys x IM	η^2_p	Contrast analysis		
											Group	F	η^2_p
L1 Reading accuracy (%)	95.5 (.54)	92.5 (.65)	93.9 (.72)	95 (.86)	.689		.608		7.477*	.245	CLIL	10.523**	.314
											non-CLIL	.855	
L1 Reading speed	300.4 (13.14)	379.7 (14.07)	342.2 (17.34)	322.2 (16.19)	10.581**	.306	.263		3.765				
L1 Spelling (errors) (for the 5 th school grade)	22.4 (2.47)	38.2 (4.11)	27 (3.49)	38 (5.81)	8.540*	.348	.361		.269				
FL receptive vocabulary (Z-score)	.74 (.14)	.04 (.18)	-.54 (.19)	-.41 (.24)	.002		22.576***	.475	4.153				
School outcomes (%)	70.54 (2.3)	76.9 (3.11)	78.3 (2.13)	61.34 (2.87)	.057		1.625		39.397***	.738	Dyslexic	14.644**	.511
											Control	6.627*	.321

Note. Effect sizes are only provided when main effects are significant. A contrast analysis was conducted only when the interaction Dys x IM was significant.

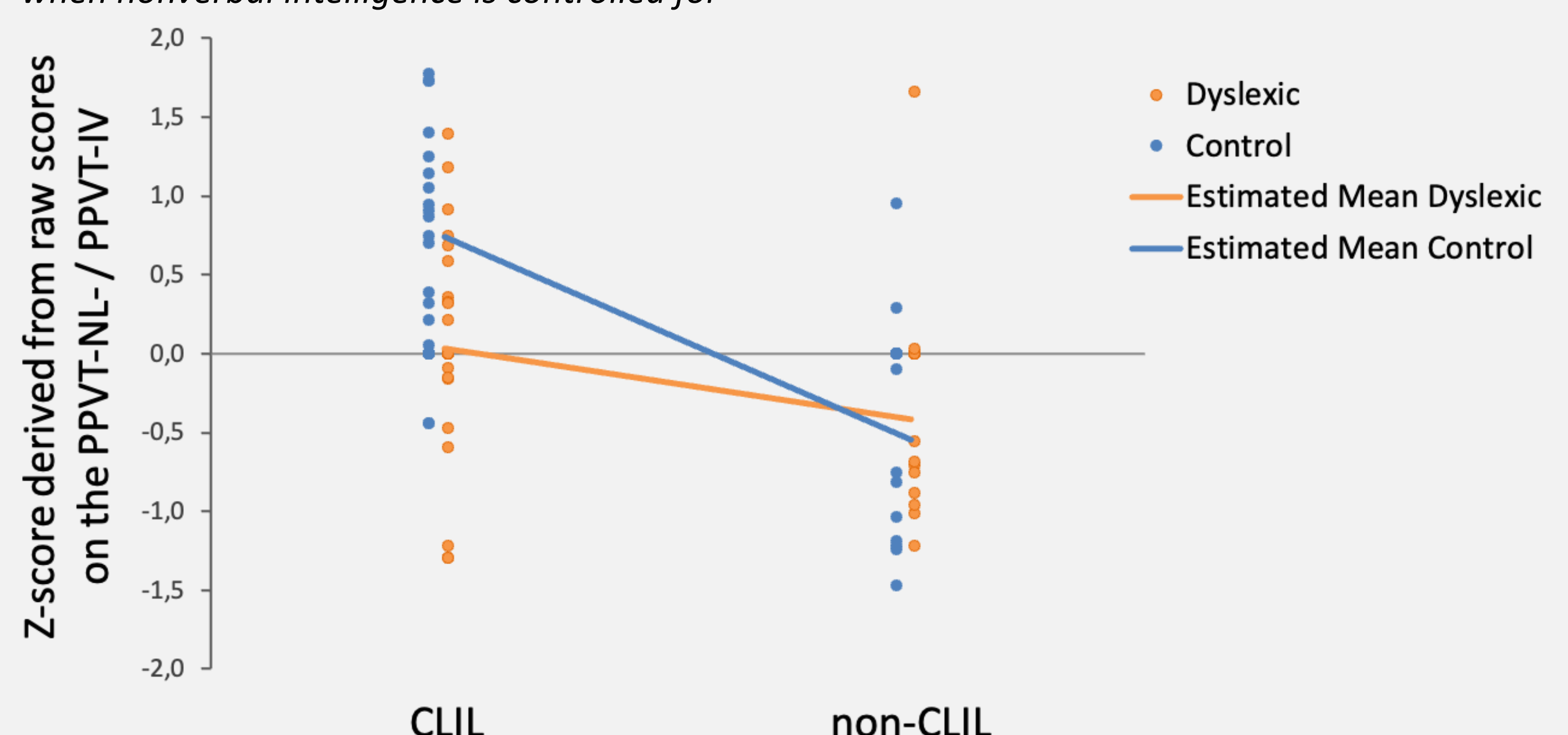
* $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 1 Reading accuracy index as a Function of Dyslexia and Instruction Method when School Level and French receptive vocabulary are controlled for



Note. The straight lines represent the difference in terms of reading accuracy index estimated marginal mean between pupils with dyslexia and control pupils for CLIL and non-CLIL groups.

Figure 2 Foreign-language receptive vocabulary as a Function of Instruction Method and Dyslexia when nonverbal intelligence is controlled for



Note. The straight lines represent the difference in Z-scores derived from the raw score PPVT-NL/PPVT-IV estimated marginal mean between the CLIL and non-CLIL groups for control pupils and pupils with dyslexia.

Conclusion

- No measurable evidence for a major disadvantage for pupils with dyslexia to participate in immersion programs, neither in terms of L1 literacy, FL proficiency and school achievement.
- First evidence in favor of an added value of immersion education regarding FL proficiency and school achievement for immersed pupils with dyslexia
- Particularly valuable findings for education actors, speech-therapists and especially for parents to support decision making

References

- de Bree, E. H., Boerma, T., Hakvoort, B., Blom, E., & van den Boer, M. (2022). Word reading in monolingual and bilingual children with developmental language disorder. *Learning and Individual Differences*, 98, 102185.
- Hiligsmann, P., Van Mensel, L., Galand, B., Mettwie, L., Meunier, F., Szmalec, A., Van Goethem, K., Bulon, A., De Smet, A., Hendrikx, I., & Simonis, M. (2017). Assessing Content and Language Integrated Learning (CLIL) in French-speaking Belgium: Linguistic, cognitive, and educational perspectives. *Les Cahiers de Recherche Du Girséf*, (109).
- Kruk, R. S., & Reynolds, K. A. A. (2012). French immersion experience and reading skill development in at-risk readers. *Journal of Child Language*, 39(3), 580–610.