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Improving fluency and reading comprehension for beginning readers of French

Ludivine Javourey-Drevet[1,2,3], Stéphane Dufau[1], Thomas François[4], Núria Gala[5], Jacques Ginestié [2], Johannes C. Ziegler[1]

1 Aix-Marseille Univ, CNRS, Laboratoire de Psychologie Cognitive (UMR 7290)
2 Aix-Marseille Univ, Apprentissage, Didactique, Évaluation, Formation (EA 4671)
3 Univ Lille, CNRS, SCALab - Sciences Cognitives et Sciences Affectives, (UMR 9193).
4 Université catholique de Louvain, IL&C, CENTAL
5 Aix-Marseille Univ, CNRS, Laboratoire Parole et Langage (UMR 7309)

ludivine.javourey@univ-lille.fr

HIBOU Logo

Objectives

Comprehension of a text requires rapid progress from word recognition to the development of a mental representation of the text, based on linguistic analyses and ideas from the text, in connection with knowledge of the world.

According to the "simple" model of reading (Hoover and Gough, 1990), written comprehension is the product of two independent skills: oral comprehension (vocabulary and retrieval of semantic information) and decoding (identification of written words). However, a large proportion of children of primary school age encounter major difficulties in acquiring this skill.

In this context, the aim of our study was to determine whether text simplification, a process of reducing the complexity of a text while retaining its meaning, can improve reading fluency and comprehension in children who are learning to read.

Fluency and reading comprehension of students can be improved by training with simplified literary and scientific texts available through HIBOU. It is an eBook application displaying adapted texts and text comprehension activities.

The application has been used in six elementary schools in France to evaluate and train reading fluency and comprehension skills on beginning readers of French (Javourey-Drevet, 2021). HIBOU displays the ALECTOR corpus (Gala et al. 2020), with original and simplified versions.

Text simplifications have been manually performed at the lexical, syntactic, and discursive levels. The child can read in autonomy and has access to different games on word identification.

Methodology

First experimental phase: cognitive, linguistic and socio-cultural tests for each participant individually.

Second experimental phase: an eBook (HIBOU, Javourey-Drevet et al. 2022) was developed on iPads to enable the participant to choose a text, read it and answer to comprehension questions. The eBook measured and stored on a server the reading speeds and comprehension scores.

165 students read independently **20 texts in French** (10 documentary texts and 10 narrative texts) in the original and simplified version. Each corpus was followed by **5 comprehension questions** and 3 suggested answers.

HIBOU at schools (reading tests)

Reading comprehension and fluence

Cognitive tests
(for each participant individually)

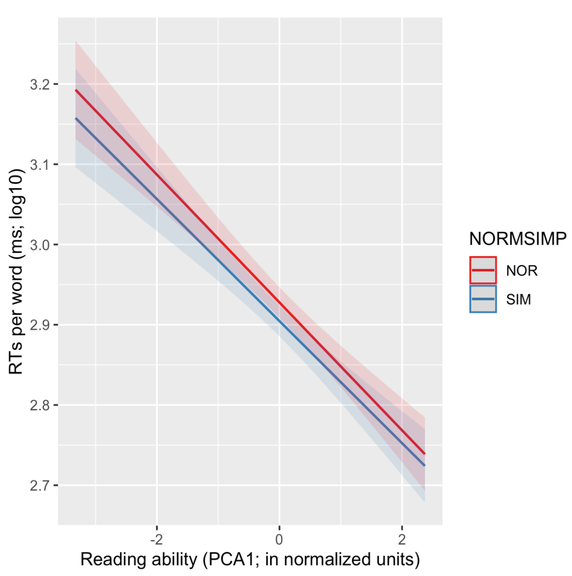
EVALUATION PROFILES
- READING SPEED
- VOCABULARY (lexicon)
- PHONOLOGY
- WORKING MEMORY
- MORPHOLOGICAL AWARENESS
- ORTHOGRAPHIC SKILLS
- …

Reading on the eBooks
in autonomy

NATURE OF TEXTS
- SCIENTIFIC TEXTS (documentary)
- LITERARY TEXTS (narrative)

IMPACT OF SIMPLIFICATION
- ORIGINAL TEXTS
- SIMPLIFIED TEXTS

Results

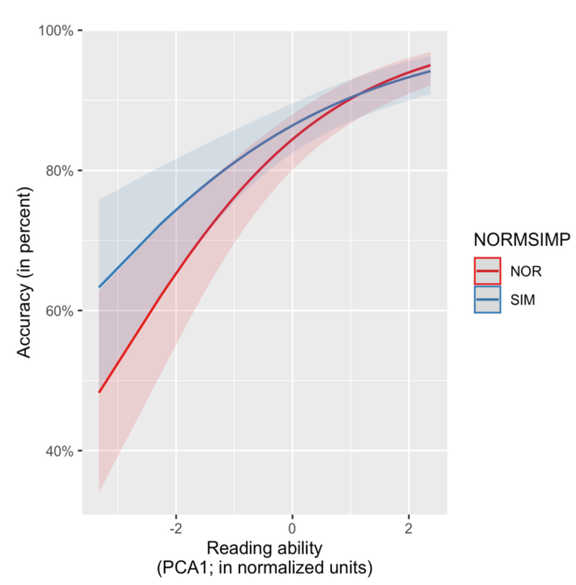


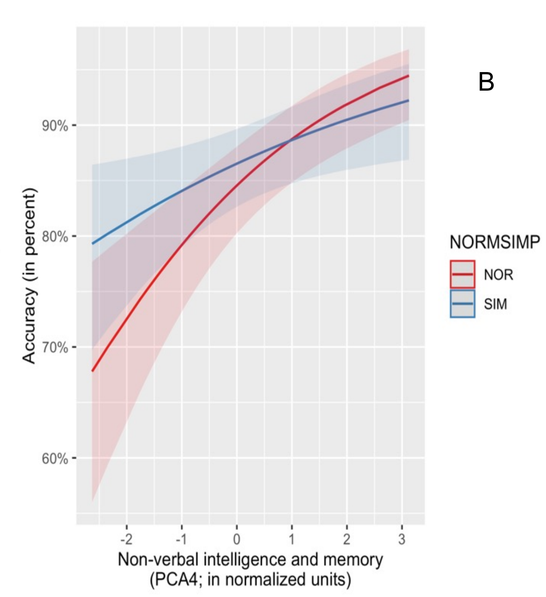
Modulation of reading speed (milliseconds per word, log10, y-axis) as a function of reading ability (PCA1, normalized units, x-axis).

Solid and dashed lines are the estimated reading times for original and simplified texts at different levels of reading ability.

Semitransparent areas are confidence intervals
PCA1 reflected reading ability

A





B

Text comprehension accuracy (percent correct, Y-axis) as a function of reading ability (A) and nonverbal intelligence (B).

Solid and dashed curves are the estimated accuracies at different levels of the component variable (in standardized units, X-axis).

Semi-transparent areas are confidence intervals.

PCA4 reflected nonverbal intelligence and working memory.

Conclusion

The results showed that **both reading fluency and reading comprehension were significantly better for simplified than for normal texts**. Poor readers and children with weaker cognitive skills (nonverbal intelligence, memory) benefitted to a greater extent from simplification compared to good readers and children with somewhat stronger cognitive skills.

Hoover, W. A., & Gough, P. B. (1990) The simple view of reading. *Reading and writing*, *2*(2), 127-160.

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Javourey-Drevet, L., Dufau, S., Ziegler, J.-C. & Gala, N. (2022) HIBOU: an eBook to improve Text Comprehension and Reading FLuency for Beginning Readers of French. In proceedings of the *2nd Workshop Tools and Resources for Reading Difficulties (READI) at 13th International Conference on Language Resources and Evaluation (LREC 2022)*. Marseille, France.

Javourey-Drevet, L. (2021). La simplification de textes comme outil pour améliorer la fluidité et la compréhension de lecture chez les enfants à l'école primaire. Thèse de Doctorat, école doctorale Langage Cognition, Éducation, Aix Marseille Université.