

Can second-grade struggling readers from low socioeconomic and language-minority background benefit from GraphoGame, a computer-assisted reading intervention?

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INTRODUCTION

In students from low socioeconomic backgrounds and language minorities:

- PISA and PIRLS show a persistent reading-comprehension gap (Bricteux, S. et al., 2021; Schillings, P. et al., 2017).
- Weak word-reading skills are a major contributor to comprehension difficulties (Capin, P. et al., 2024).
- Explicit reading instruction is the most effective approach (Castles, A. et al., 2018; Goldenberg, C., 2020).

GraphoGame is a computer-based phonics method shown to have an **impact**:

- In native-speaking second-graders with persistent reading difficulties (Ahmed et al., 2020).
- Among economically disadvantaged first-grade French children (Lassault et al., 2020).

AIM

Assess whether among **second-grade students from low socioeconomic and language-minority backgrounds, schooled in French**, an intervention based on GraphoGame improves basic reading skills in struggling readers.

METHODS

Participants

From a low SES school.
20 second-grade students (mean age: 7.7 years),
Parents' home language mostly not French.
Struggling readers.

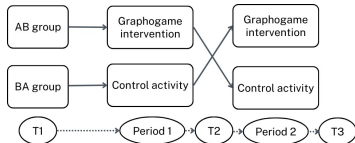


Tasks (pre and post intervention)

Letter-name knowledge (Mousty et al., 1994)
Grapheme-sound knowledge (Mousty et al., 1994)
Pseudowords reading (pseudowords using learned in first-grade)
GraphoGame words reading
Reading rate task (Billard et al., 2013) – Score = Number of words correctly read in 1 minute. The cut-off score in first grade is 20 words.

Crossover design

Two groups of 10 students:
AB and BA groups



Instructional and remediation programs

- A. **GraphoGame intervention**
 - B. **Control activity** = arithmetic computer game
- 5 weeks, Mon-Fri, one 20-minute session/day per intervention
+ reading remediation (phonics): weekly 30-min small group sessions

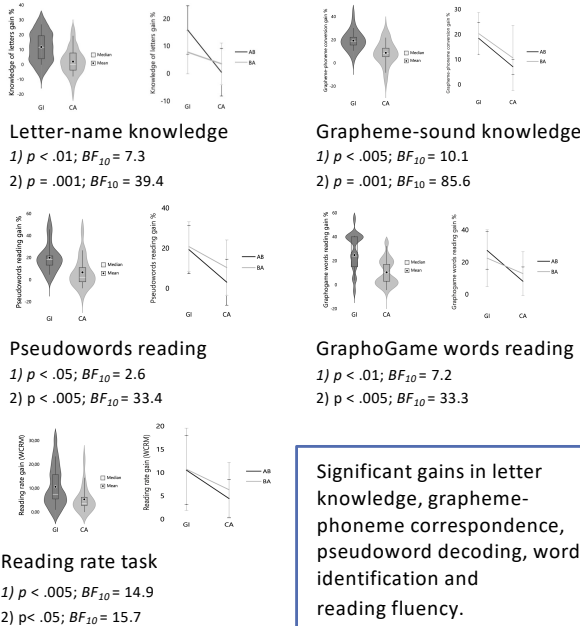
RESULTS

Raw scores	AB group (μ, σ)			BA Group (μ, σ)		
	T1	T2	T3	T1	T2	T3
Letter-name knowledge (%)	68.08	83.84	84.23	73.46	76.92	84.61
Grapheme-sound knowledge (%)	23.99	20.34	17.62	13.01	13.20	10.57
Pseudowords reading (%)	49.85	69.09	72.12	48.79	59.09	79.85
GraphoGame words (%)	40.80	68.00	76.00	46.40	59.20	81.60
Reading rate (WCRM)	5.70	16.20	20.60	5.70	12.00	22.70
	6.73	13.13	16.78	7.47	10.32	19.30

Statistical analysis

- 1) Comparison of overall gain scores obtained with each intervention (t-test)
- 2) ANOVAs on gain scores with condition (GraphoGame or control activity) and group (AB or BA) as factors → Condition effect ?

Comparison of gains after GraphoGame and after the control activity



CONCLUSION

- These results showed that GraphoGame, a computer-based phonics method, can support the acquisition of basic reading skills among struggling second-grade readers from low socio-economic and language-minority backgrounds.
- When traditional classroom instruction fails to produce sufficient progress, positive outcomes in reading acquisition may still be achieved through a phonics intervention.
- Results also revealed individual differences in responsiveness to the intervention. While many students progressed substantially, others showed limited improvement, emphasizing the need to continue providing differentiated support in the classroom.

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