Frequency neighborhood effects in good and less good French spellers in 3rd and 5th grades: A masked priming study

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INTRODUCTION

To recognize written words, readers need to process phonological units and orthographic units. While phonological units have been deeply examined in reading acquisition, less is known about orthographic coding in children.

From the lexicon point of view, word recognition development may be seen as a discrimination process. The orthographic representations need to become progressively more fine-tuned, due to increase number of words, more precisely, of neighbor words (words that share all but one letter) as pointed by Castles et al. (1999).

In their study, Castles et al. has used the priming paradigm and have showed that children display significantly greater priming overall than adults for high neighborhood size words. However, the predicted gradual attenuation of priming across age was not found. Priming was expected to decrease with age, due to increase of neighborhood size, leading to more lexical competition.

An alternative view to explain lexical competition is linked to the relative neighbourhood frequency. Some studies tested this hypothesis (Segui & Grainger, 1990) and observed inhibitory effects independently neighborhood size.

AIM OF THE STUDY

The objective is to examine whether children, varying in reading and spelling level, may be distinguished in the way they encode orthographic information. Particularly, this study aims at observing if lexical competition may be observed, and how early, in developing readers.

This was tested through an expected reduction of facilitator effects in formal priming, due to presence of a more frequent orthographic neighbor.

METHOD

Participants:
46 Grade 3 French normal readers (23 good spellers & 23 less good spellers)
36 Grade 5 French normal readers (19 good spellers & 17 less good spellers)

Stimuli:
240 pairs of items (prime-target)/120 words:
- 60 orthographically related primes:
  - 30 pairs of items with a more frequent orthographic neighbor shared: pable-SABLE (TABLE is orthographic neighbor)
  - 30 pairs of items without a more frequent orthographic neighbor shared: canse-DANSE (cancer-DANCE)
- 60 orthographically unrelated primes: noqne-SABLE (gurt-SAND); pocte-DANSE (tirve-DANCE)
Primes are only pseudowords.

Procedure: Masked priming (Forster & Davis, 1984). Lexical Decision task

RESULTS

RTs faster than 300 ms and slower than 3000 ms were removed from the data analysis.
RT Data were log-transformed because they were skewed to the right. This procedure conducted the data set to be more symmetric.

Data were then analyzed in a mixed-design analysis of variance (ANOVA) with 4 factors:
- Reading level (Grade 3 and Grade 5)
- Spelling level (Good and Less good)
- Priming (Related and Non related primes)
- Presence of a more frequent orthographic neighbor shared (= ONS) (With and Without)

Orthographic priming emerge from grade 3. Facilitator effects are observed in 3rd and 5th grades.

In grade 3:
- No orthographic priming was evidenced in less good spellers, probably due to orthographic representations poorly specified.
- Orthographic priming in good spellers is observed in both conditions (with and without an orthographic neighbor more frequent). This result suggest that no competition emerge in grade 3.

In grade 5:
- The same patterns are observed in less good and good spellers probably due to too weakly contrasted groups. Planned comparisons revealed orthographic priming in the condition without a more frequent orthographic neighbor while no priming in the condition with a more frequent orthographic neighbor. This result suggests that lexical competition has emerged in 5th grade. Note however that contrary to what has been observed in expert readers (Segui & Grainger, 1990; Grainger & Segui, 1995) more inhibitory effect have been noticed in children.

CONCLUSION

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