MORPHEMES AS LETTER CHUNKS: A DEVELOPMENTAL PERSPECTIVE

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BACKGROUND

Morphemes are chunks of frequently co-occurring letters with semantic or syntactic properties (e.g., the suffix -er in *dealer* and *player* denotes an agent) and play an important role in visual word processing [1,2]. But how do we construct morpheme representations? Our previous work demonstrated that, even in the absence of linguistic information, skilled readers can learn about the presence and position of affix-like chunks by relying purely on the visual regularities that underlie the internal structure of character strings [3]. The present study examines whether developing readers rely on the same chunking mechanism to form affix-like representations.

RESEARCH QUESTION

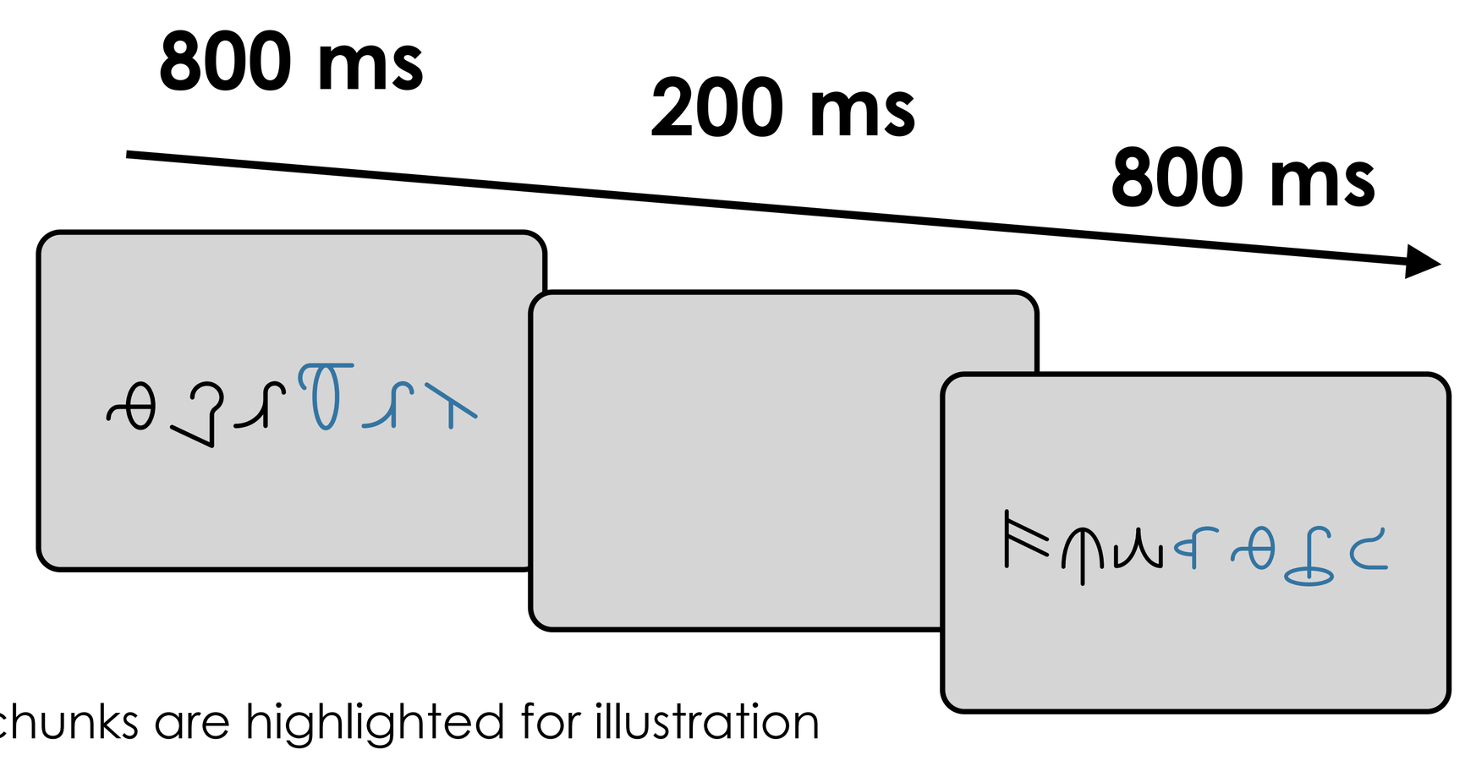
To what extent do developing readers rely on visual statistical regularities to form affix-like representations?

METHODS

LEARNING PARADIGM

1.EXPOSURE PHASE

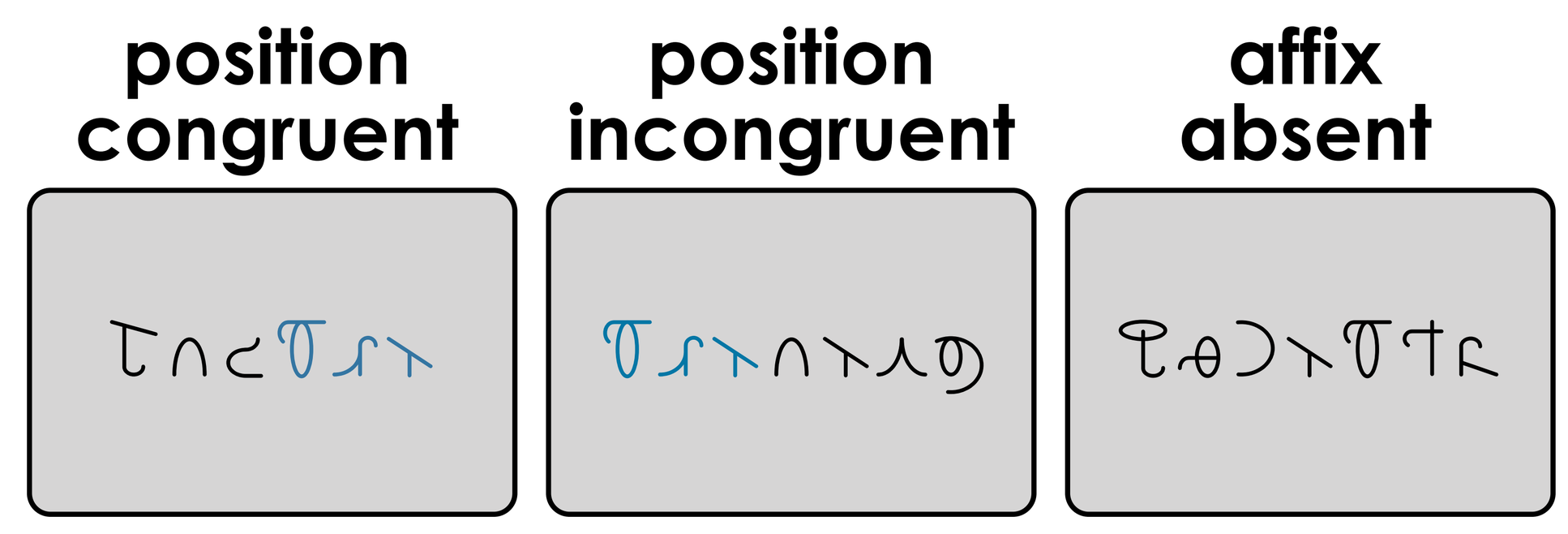
- Passive viewing of 100 pseudo-letter [4] strings
- Strings made of a random sequence and a suffix-like chunk of frequently co-occurring characters (e.g.,)
- Each suffix-like chunk was repeated 20 times



Note. Suffix-like chunks are highlighted for illustration

2.JUDGMENT TASK

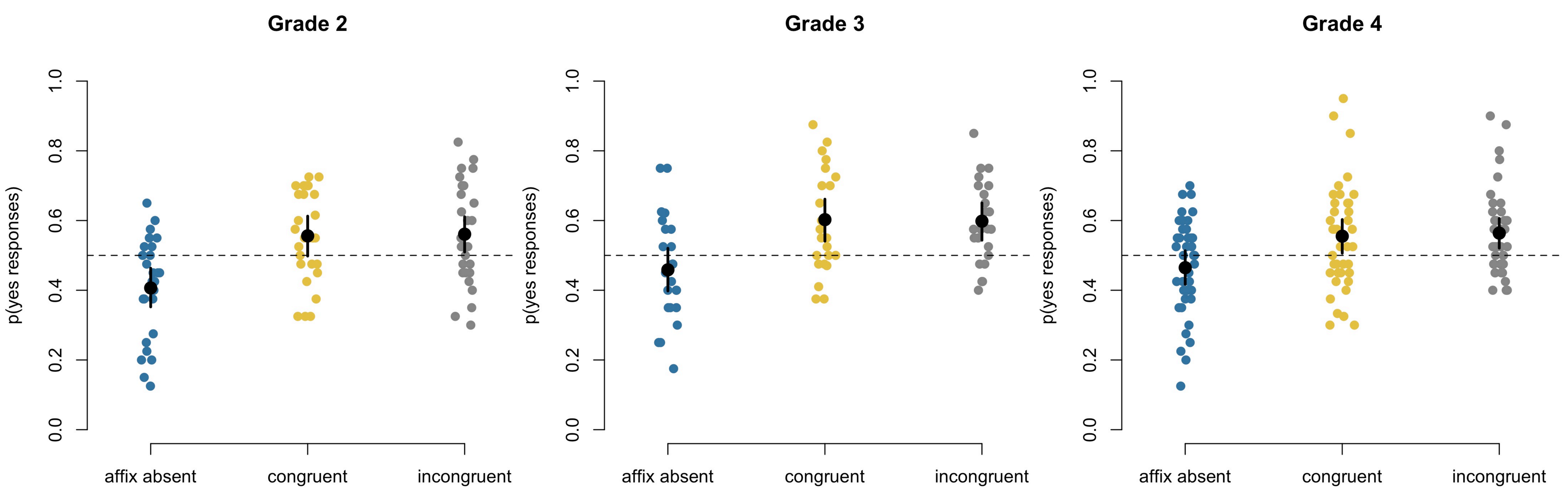
- Does the string belong to the same "alien" language seen in the exposure phase? Yes/No keypress
- 120 novel pseudo-letter strings
- Stimulus duration: response terminated



PARTICIPANTS

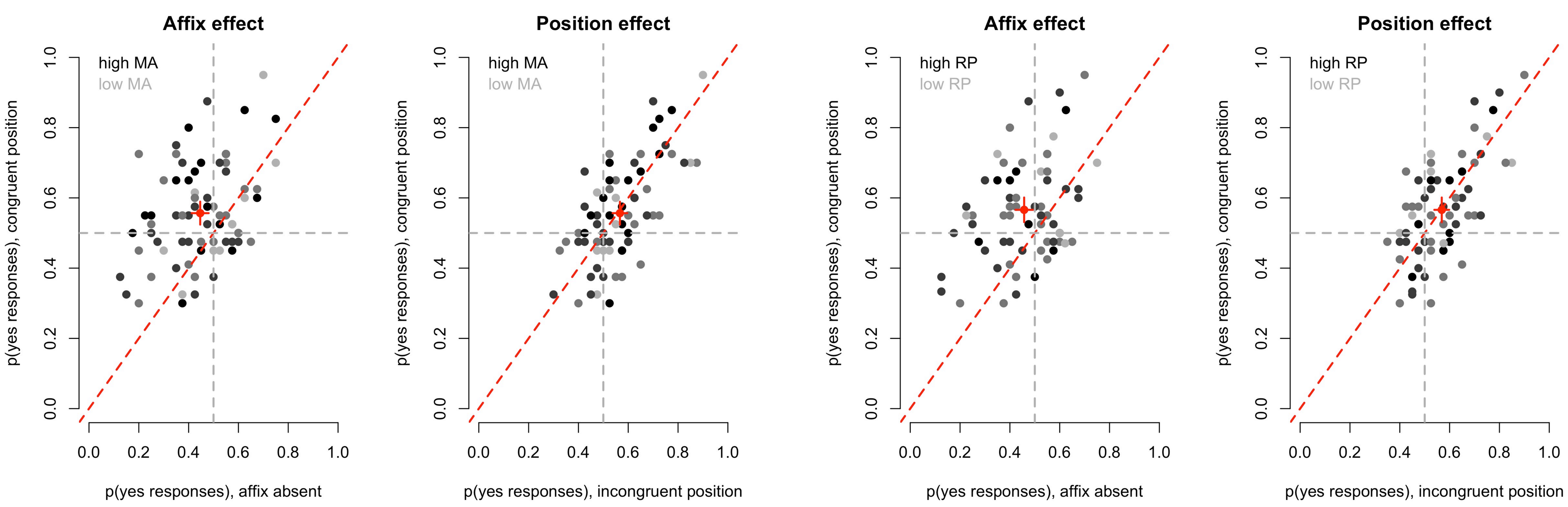
- 92 children; native-Italian speakers
- Grade 2: 28, Grade 3: 24, Grade 4: 40
- Age: M = 8.8, SD = 0.9; range = 7.1-10.4
- Additional assessments:
  - Reading aloud proficiency
  - Morphological awareness
  - Non-verbal intelligence

RESULTS



~MORPHOLOGICAL AWARENESS

~READING PROFICIENCY



- Children identified suffix-like chunks within strings: position-congruent strings were more often ascribed to the familiarisation lexicon, as compared to affix-absent strings ($\hat{\beta} = .60$, $z = 4.64$, $p < .001$; main effect condition: $\chi^2(2) = 49.85$; $p < .001$)
- No sensitivity to the position of chunks: no difference between position-congruent and position-incongruent strings ($\hat{\beta} = .02$, $z = 0.21$, $p = .832$)
- School grade did not interact with affix identification or sensitivity to affix position ($\chi^2(4) = 2.89$; $p = .576$)
- Additional analyses: neither morphological awareness nor reading aloud proficiency reliably modulated affix or position effect (condition X MA: $\chi^2(2) = 4.87$; $p = .087$ condition X RP: $\chi^2(2) = 2.34$; $p = .310$)

CONCLUSIONS

- Like skilled adult readers [1], children between the ages of 7 and 10 spontaneously extract statistical regularities present and use them to identify chunks of frequently-occurring characters.
- Unlike skilled adult readers, however, children of this age do not show sensitivity to the within-string position of character chunks, suggesting that positional constraints during chunk processing emerge later in reading development.
- Findings provide further evidence that morpheme identification during visual word processing can be, at least partly, ascribed to a general, language-agnostic cognitive mechanism that captures statistical regularities in the co-occurrence of visual objects [5,6].

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