

Stress and Literacy

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How stress is marked in written Portuguese

- Stress is a distinctive feature in Portuguese: esta-está; sai-saí; para-Pará are minimal pairs
- Most words are stressed on the second last syllable (default option)
- When a word is not stressed on the second last syllable, stress is marked

How stress is marked in written Portuguese

- If stress is on the third last syllable, a diacritic is always used
 - which one depends on the vowel sound, whether open (pólvora) or closed (tônico)
- If stress is on the last syllable, there are different ways of marking stress:
 - diacritic marks (cajá; cipó; café; você)
 - special letters that attract the stress to the last syllable (e.g., z, r, i, u)

Using vowels to mark stress

- Words that end in /i/ or /u/
 - are spelled with I or U if stressed on the last syllable
 - are spelled with E or O if stress is on the 2nd last syllable - **except** if the end sound is part of a diphthong (ai, ei, eu, au, oi etc.)
- This poses a problem for children learning to read and spell in Brazil, where these vowel sounds are the same at the end of words (tato-tatu & bebe-bebi differ only in stress)

Letter-sound correspondences

I → /i/

U → /u/

E → /æ/
→ /i/

O → /o/
→ /u/

pele (skin)

polo (pole)

Rule to be learned in reading

- If the word ends in I or U, rather than using the default option, stress is on the last syllable
- Predictions:
 - Because often there is not another word forming a minimal contrast pair, a strong lexical effect should be observed in word reading
 - Reading pseudo-words should reveal rule knowledge
 - Performance should improve with grade level

Rules to be learned in spelling

If the word ends in /i/ or /u/ use E and O for words stressed on the 2nd last syllable and I or U for words stressed on the last syllable (note exceptions in diphthongs)

carro

menino

tarde

pente

bambu

caju

aqui

sapoti

Predictions:

- Younger children will spell words with I and U correctly because they conform to letter-sound correspondence
- Use of E/O may be probabilistic (there are many more words ending in E/O than I/U)
- Performance in using E/O should improve with grade level
- Performance in I/U may fall as children become aware of exceptions (some end sounds /i/ and /u/ are spelled with E and O) but do not master the rules

Method

- Participants

- 64 Brazilian children (16 in each grade from 1st to 4th; equal number of boys and girls) attending an independent school
- ages 6 to 12, mean 8.6 (SD=1.4)

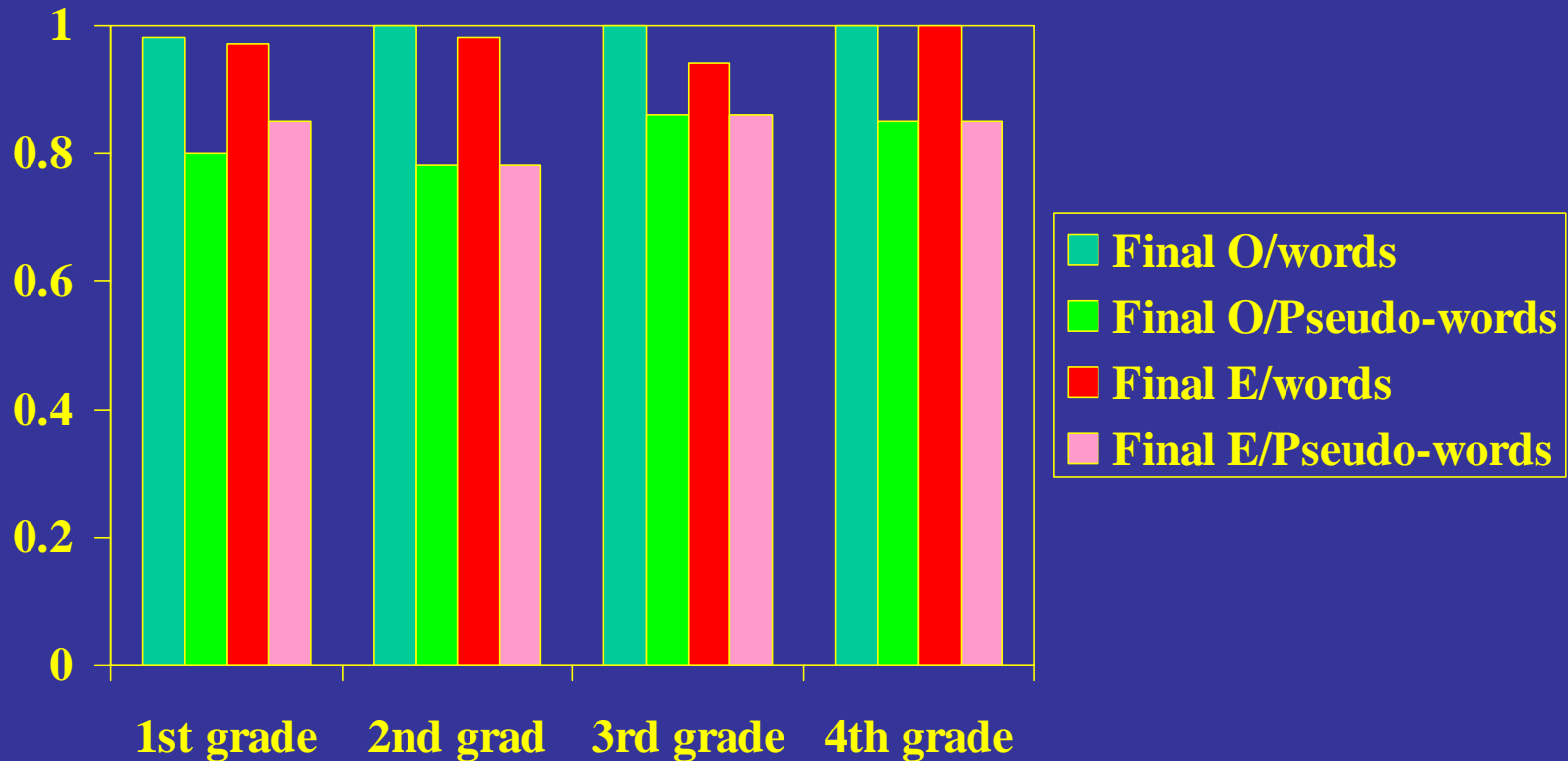
- Design

- Word and pseudo-word reading and spelling
- End sound (/i/ or /u/) by stress (last or 2nd last syllable): four examples in each category for words and pseudo-words

Method

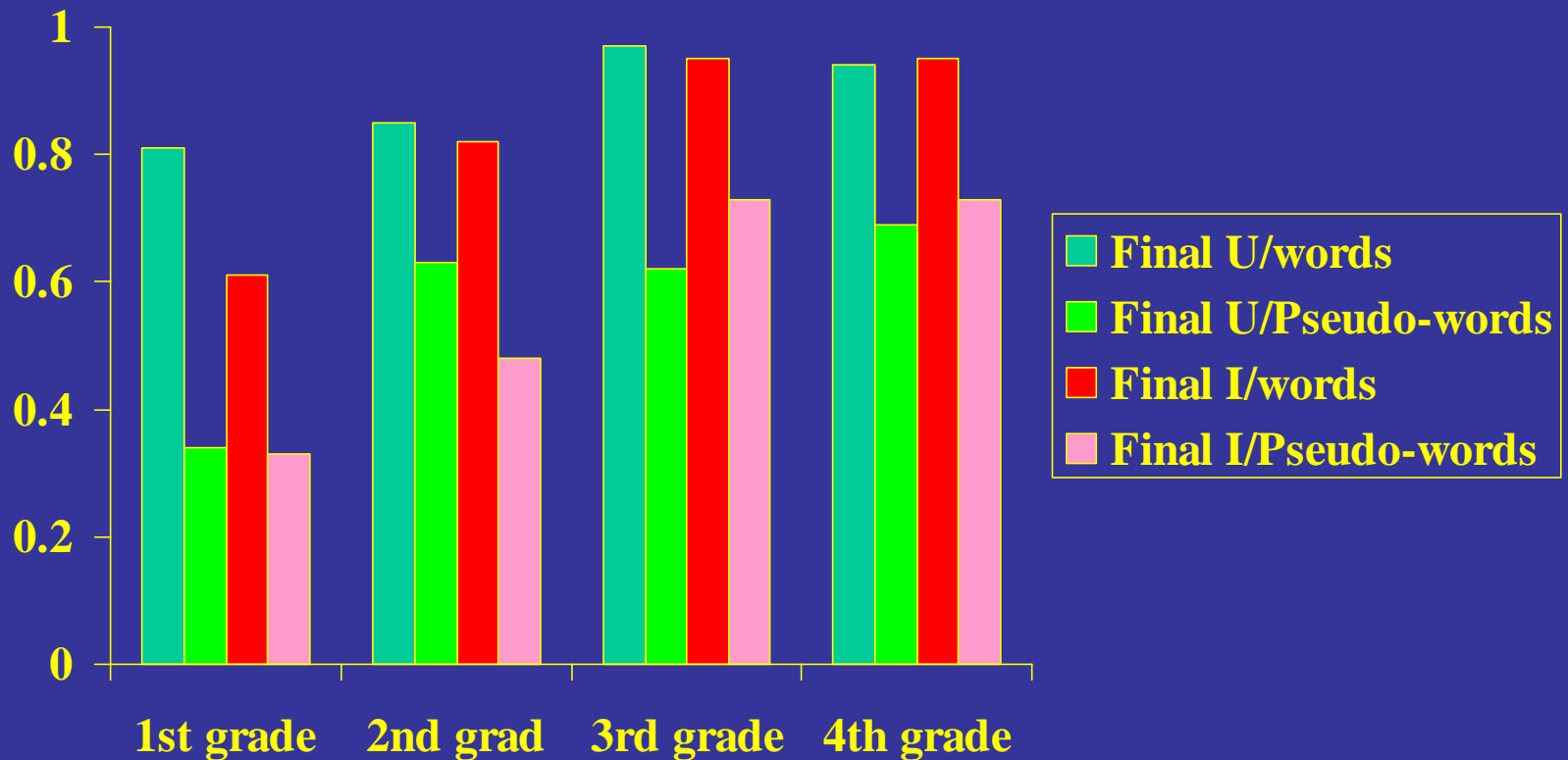
- Procedure
 - individual testing by native speaker pronouncing words naturally with the regional accent
- Results

Proportion correct when reading follows most frequent stress pattern (2nd last syllable)



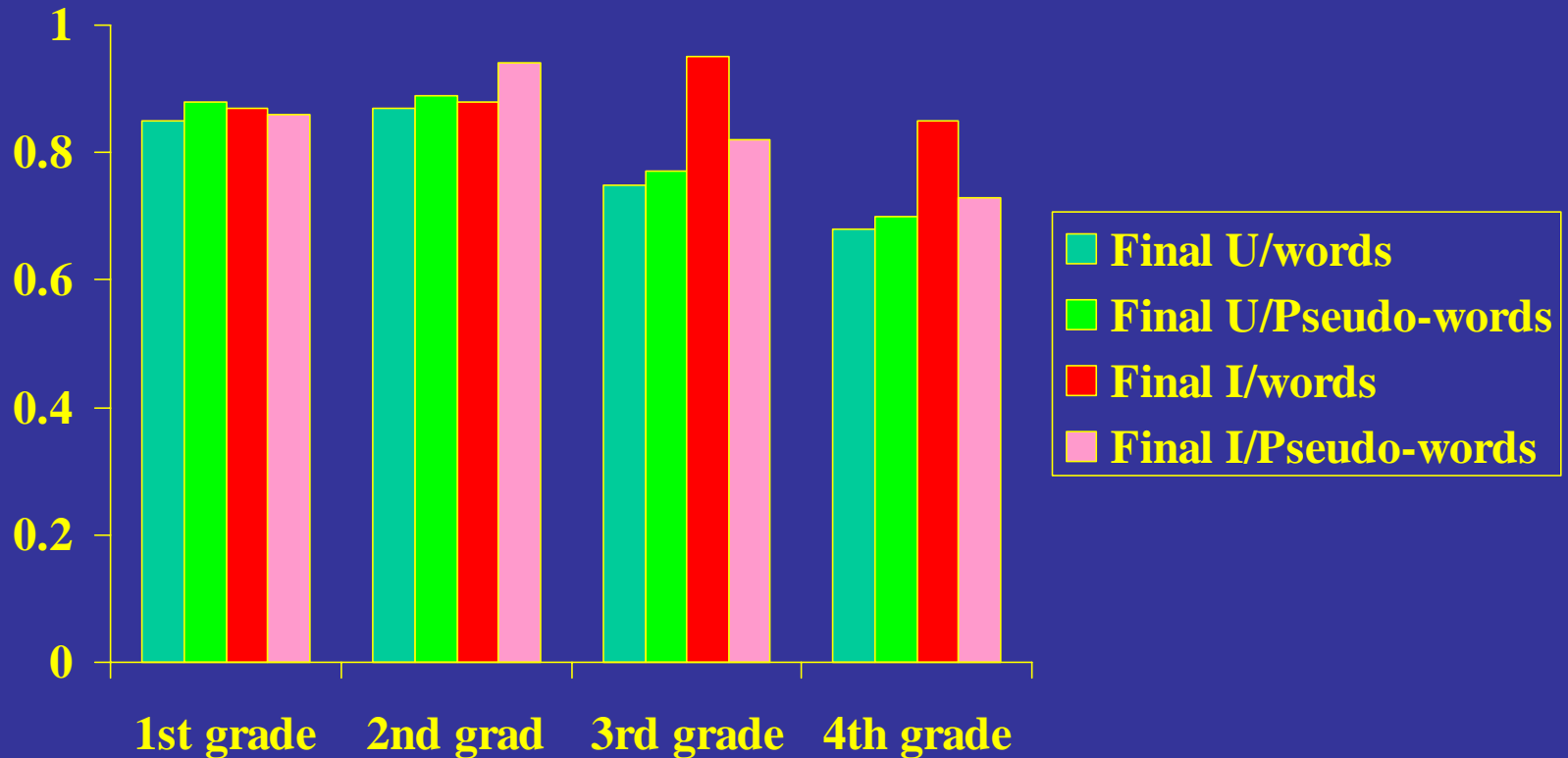
Note: strong lexical effect; PW proportion correct .78 to .86; no improvement in performance across grades (no rule to be learned)

Proportion correct when reading does not follow most frequent stress pattern (last syllable)



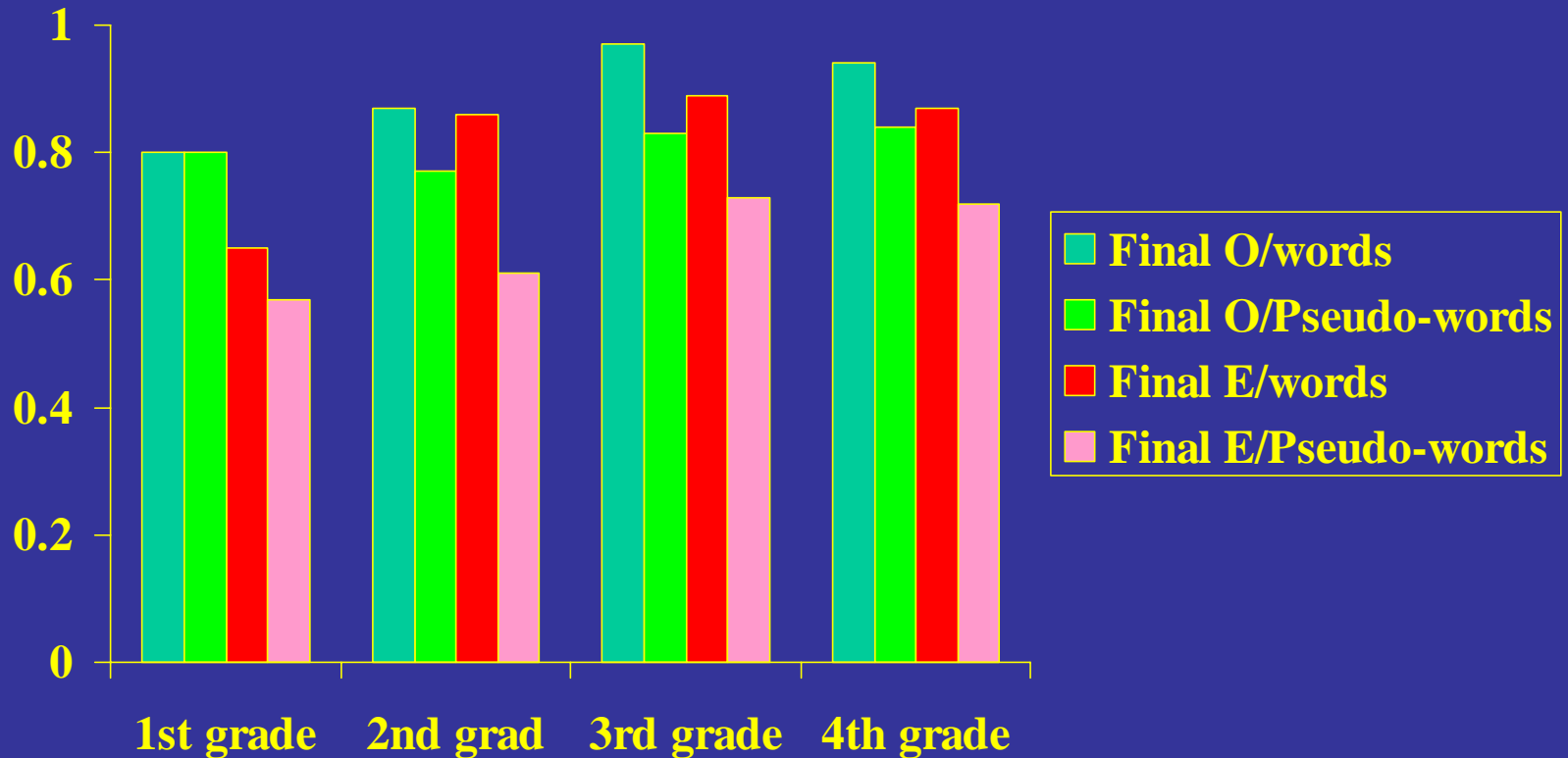
Note: strong lexical effect; PW proportion correct .33 to .73; performance improves across grades (rule acquisition)

Proportion correct when spelling follows pronounced vowel (stress on last syllable)



Note: no lexical effect; PW proportion correct .68 to .94;
performance declines across grades more noticeable in final U than
final I words (overgeneralisation)

Proportion correct when spelling does not follow pronounced vowel (stress on 2nd last syllable)



Note: weak lexical effect; PW proportion correct .57 to .84; performance improves across grades (rule learning)

Conclusions and discussion

- In reading:
 - strong lexical effects obscure evidence of rule learning in word reading
 - pseudo-word reading shows significant improvement where there is a rule to be learned (moving stress to final syllable)
 - pseudo-word reading of strings that conform to default pattern does not change with grade level suggesting incompleteness of rule learning
 - with a strict criterion (reading both sets of pseudo-words correctly): no children in grade 1 and only about 20% in grade 4 show rule knowledge

- In spelling:
 - children seem to initially follow letter-sound correspondence but spelling may reflect also probabilistic rules as 80% of words ending in non-stressed final /u/ and 65% of words ending in /i/ are spelled correctly
 - evidence for rule learning from significant grade level effect
 - evidence for overgeneralization as performance decreases in final stressed /u/ and /i/ sounds
 - with a strict criterion (both sets of pseudo-words correct): no change across grade level because of interference from overgeneralization

Questions for further research

- Many more details to be investigated about acquisition of stress marking
- Theoretical issues:
 - adults do not seem aware of the role of vowels in marking stress although they learn rule for using diacritic marks: how would they perform in reading and spelling pseudo-words?
 - learning is likely to be implicit as there is no explicit teaching: what would happen with explicit teaching?