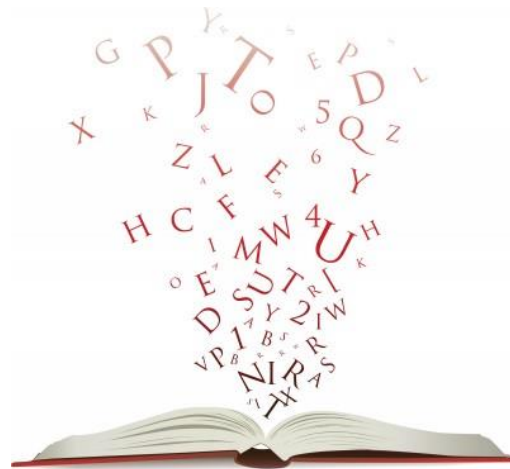

The role of context in incidental word learning during reading in children

Holly Joseph and Kate Nation



Incidental word learning



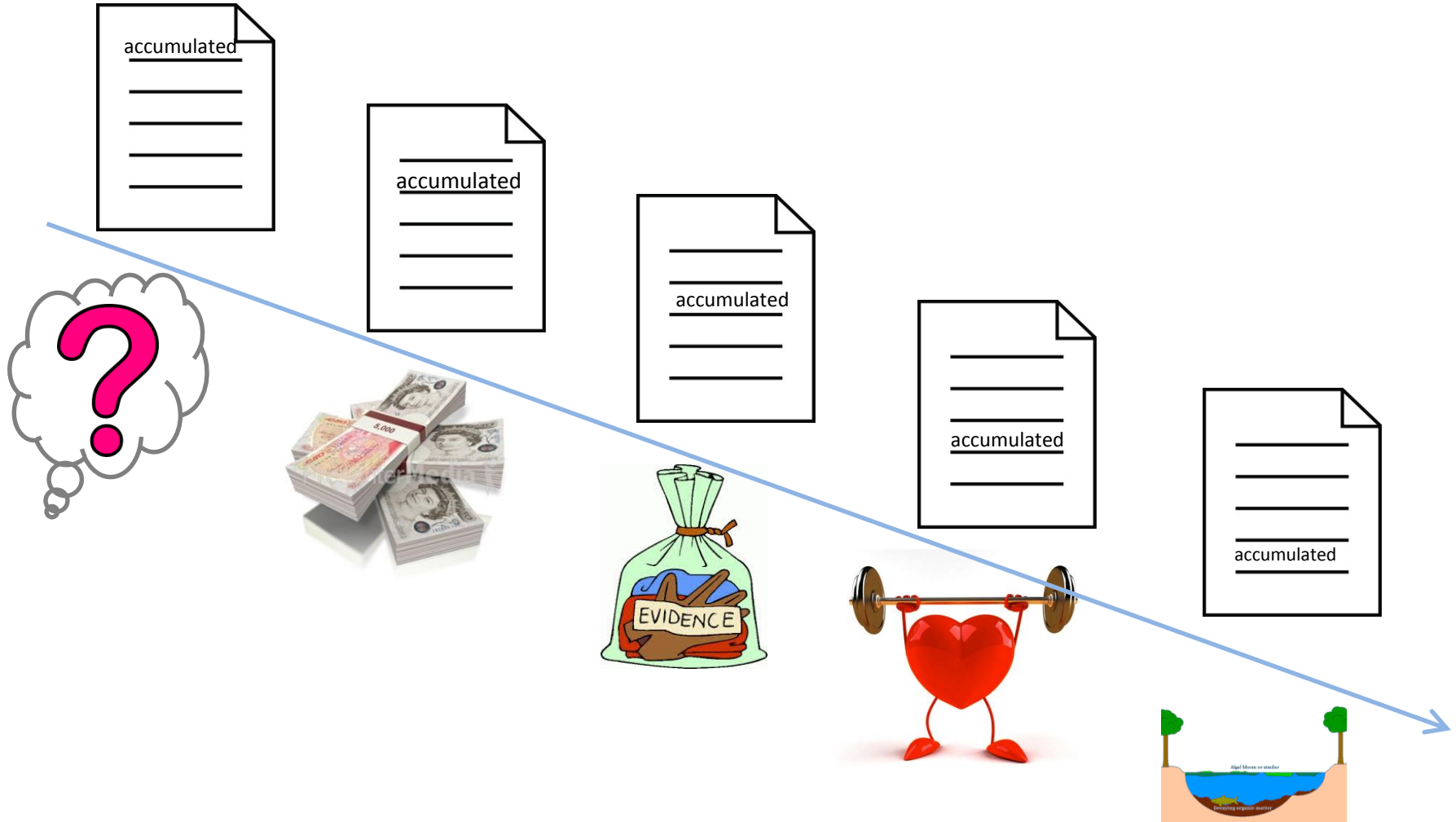
cat



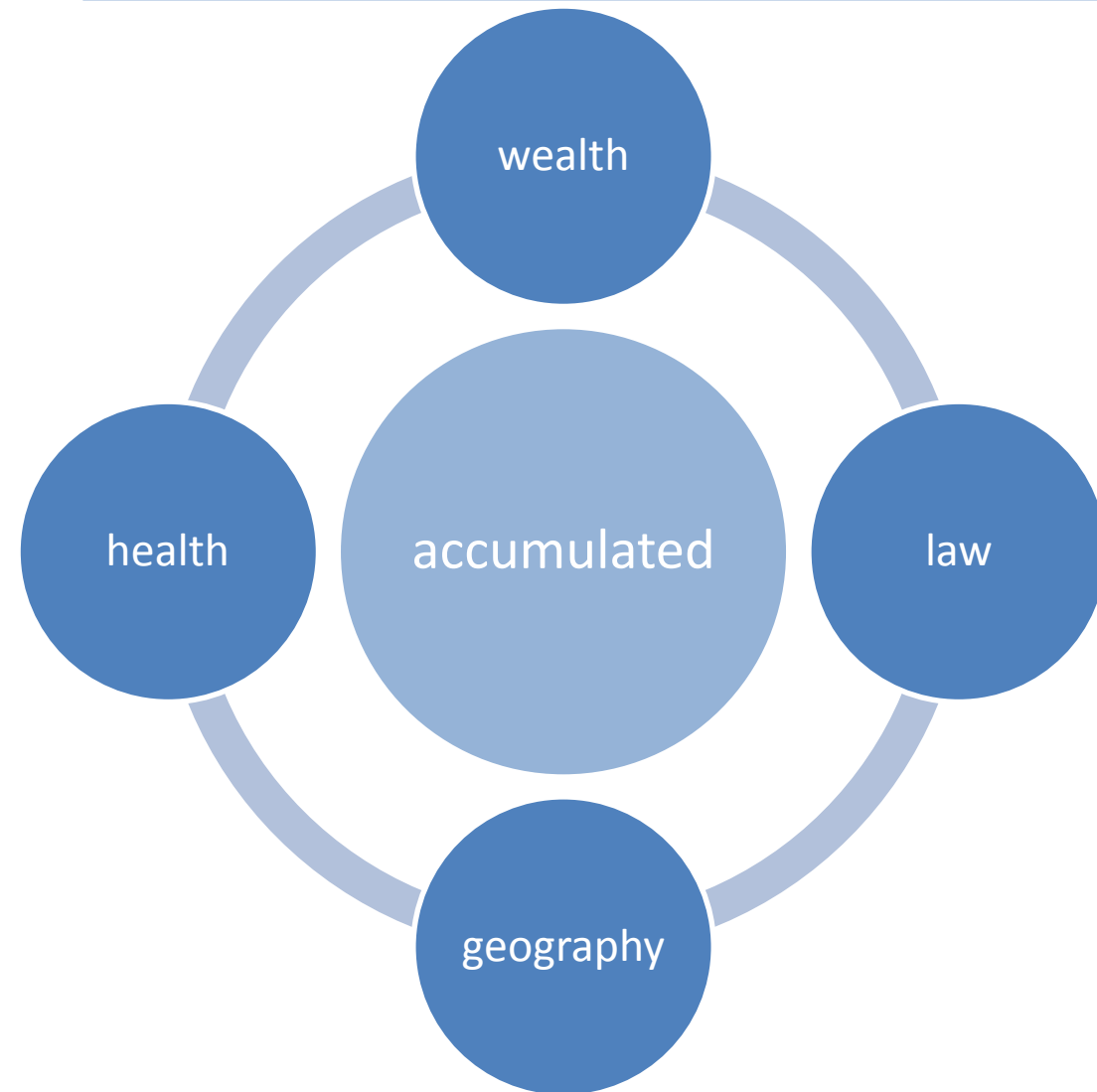
accumulated



Incremental Word Learning



Lexical quality



Mental representation that is:

- Flexible
- Precise
- Retrieved efficiently

...at all levels

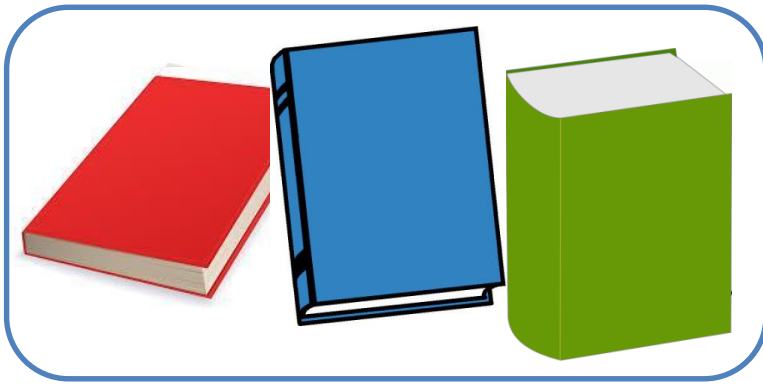
- Phonological
- Orthographic
- Semantic

The road to lexical quality

- **Characteristics of the word**
 - Number of exposures (frequency) (Brusnighan, 2015)
 - Order of presentation (AoA) (Joseph et al., 2014)
 - Concreteness (Schwanenflugel et al., 2007)
 - Part of Speech (Schwanenflugel et al., 2007)
- **Characteristics of the context**
 - Length (Wochna & Juhasz, 2013)
 - Informativeness (Bolger et al., 2008)
 - Diversity



Contextual diversity



- High diversity



- Low diversity

Faster naming times

Faster LDTs

(**Adults:** [Adelman et al., 2012;](#)
2006; **Children:** Perea et al.,
2013)

Contextual diversity



Enough proof had **accumulated** so that the jury could make a fair judgement on the case.

Although she had **accumulated** a lot of wealth, this meant she also had to pay a lot of tax.

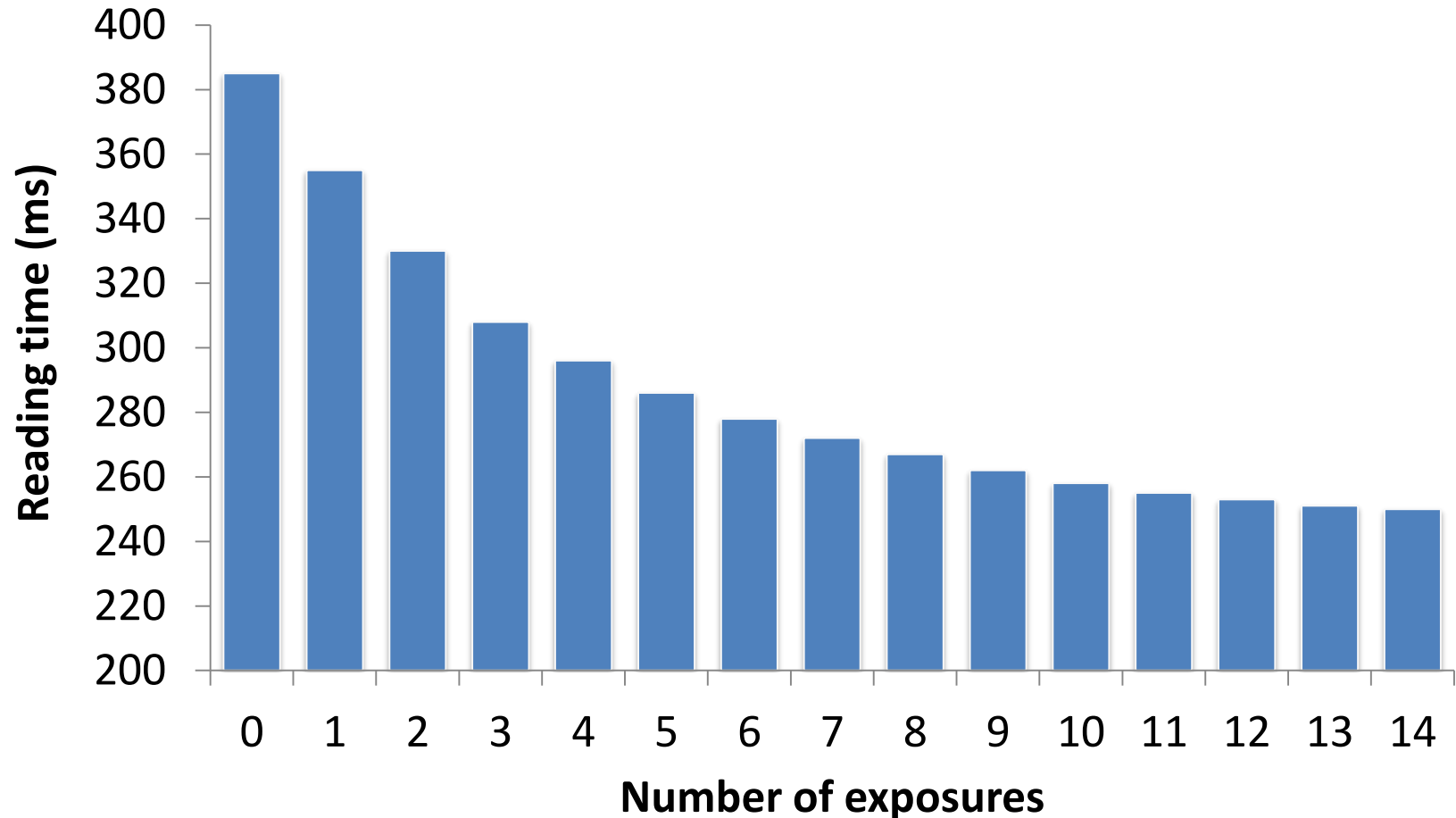
Non-diverse

Diverse

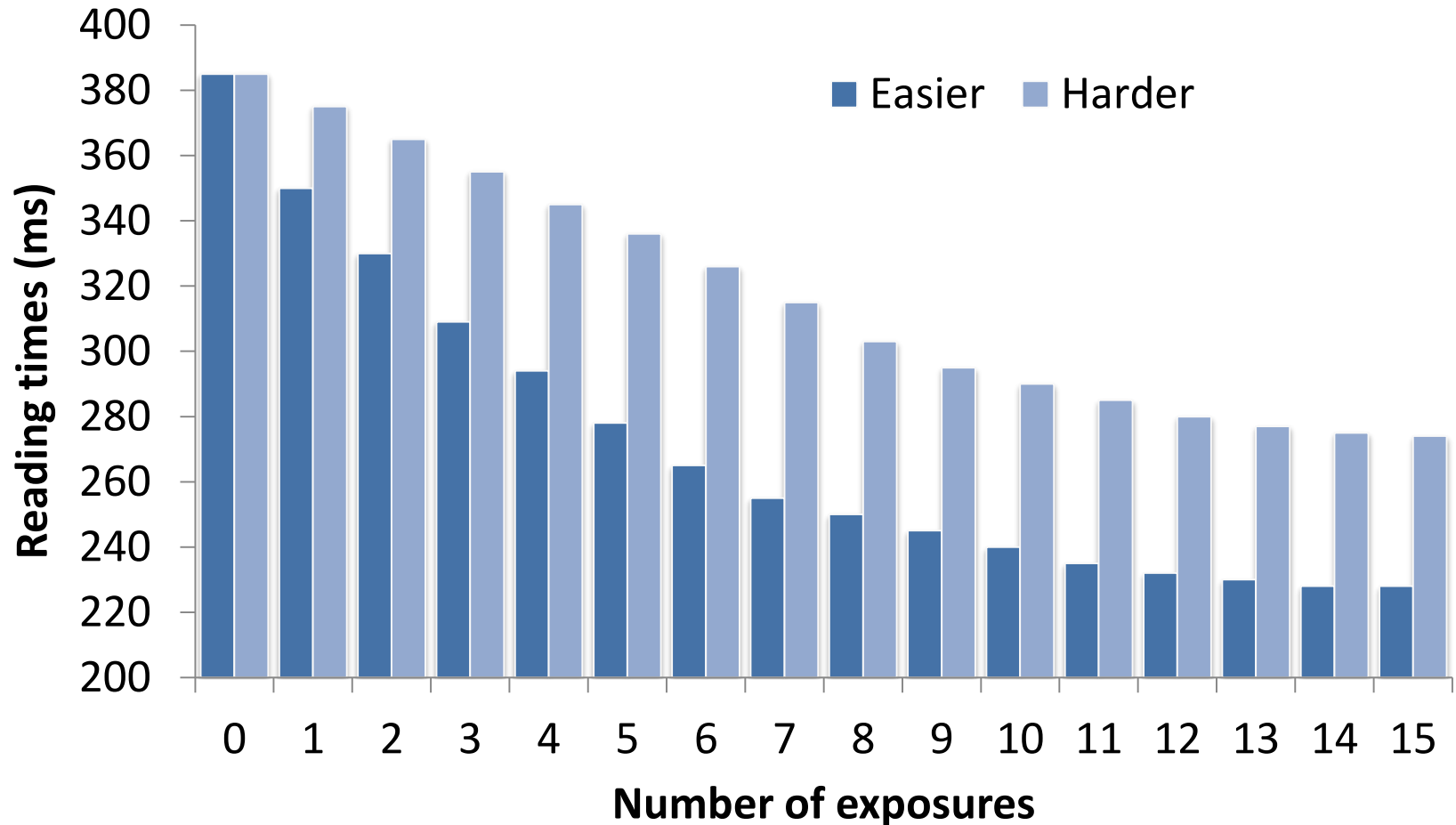
Measuring word learning

- We have measures of whether a word has been learned:
 - Orthographic learning
 - Spelling
 - Orthographic choice
 - Semantic learning
 - Ask for a definition/multiple choice
 - Semantic matching...
- But what about a measure of learning as it unfolds?
 - Eye movements during reading

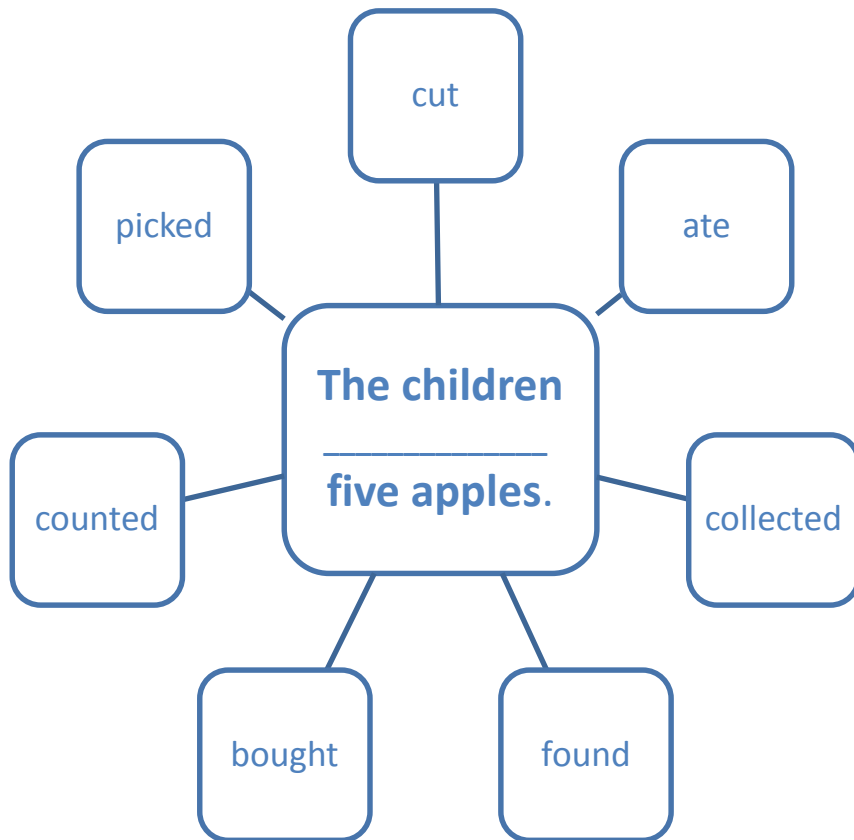
Using eye movements to examine learning



Using eye movements to examine learning



Informativeness of context



Neutral

Informativeness of context

- The children accumulated five apples.
 - Requires context-free knowledge of target word
- The detective had accumulated enough evidence to catch the criminal.
 - Context may help to access partial word knowledge
- Difference before but not after learning in these two types of context?

Research questions

- Do children learn new word meanings incidentally through reading?
 - Shorter reading times over training and at post-test
 - Above chance performance on offline tests
- Does the informativeness of a context affect reading behaviour at pre and post-test?
 - Longer reading times on/more regressions into a word when context is not informative before, but not after, training?
- Does contextual diversity affect incidental word learning during reading?
 - Shorter reading times and better performance in offline tests at post-test for target words in diverse contexts

Method

- 14 children from Year 5
 - Mean age = 10.2 yrs (SD= 0.2)
- Eyelink 1000 eye tracker
- Children read a series of sentences containing six target words (verbs)
- Eye movements monitored:
 - at pre-test
 - 6 informative and 6 neutral sentences
 - during training
 - 30 diverse and 30 non-diverse sentences)
 - at post-test
 - 6 informative and 6 neutral sentences



Training and testing schedule

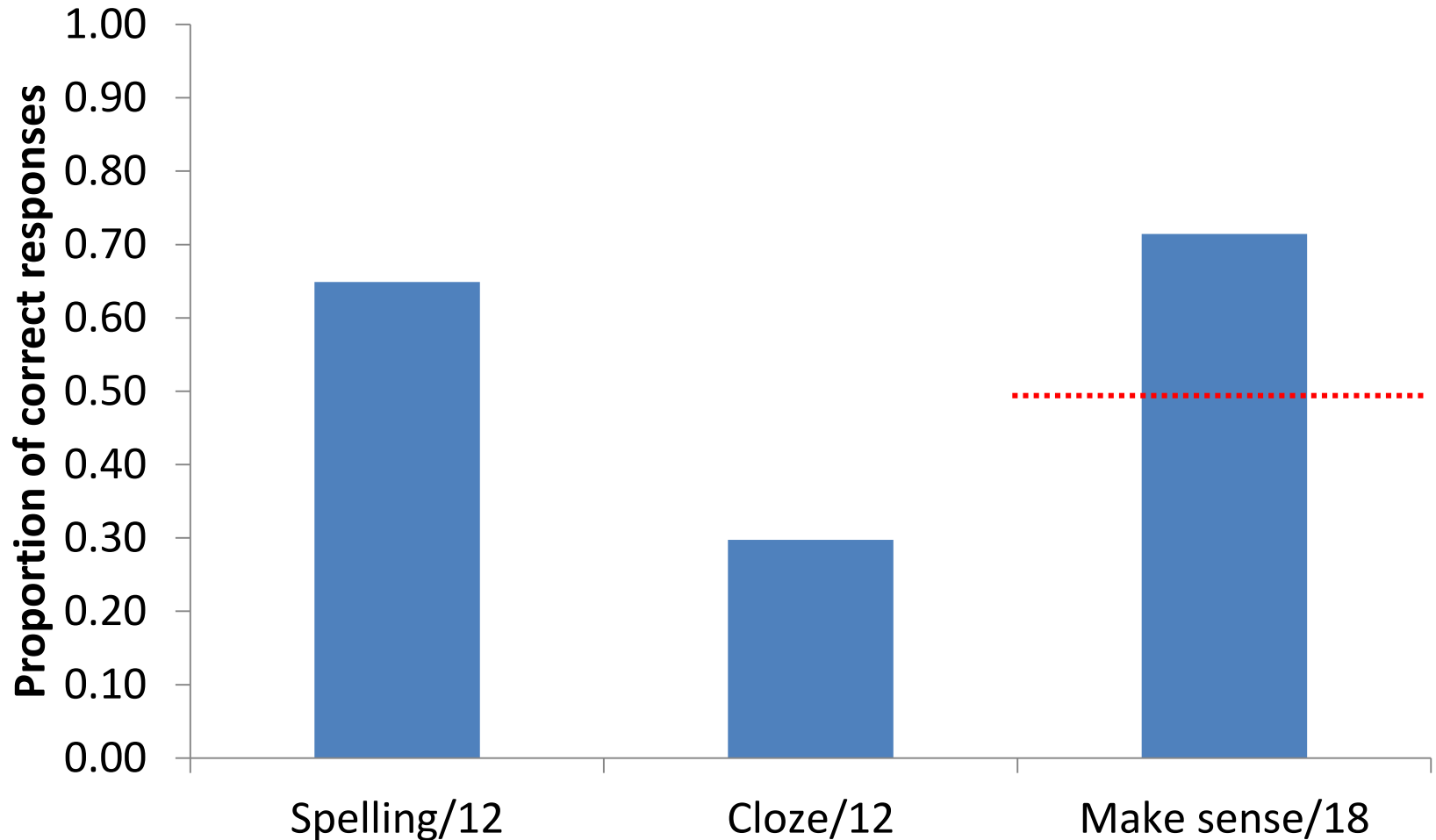
Day 1

- Pre-test
 - 6 neutral sentences
 - 6 informative sentences
- Training 1
 - 30 informative sentences
 - Low/high contextual diversity
- TOWRE: word and nonword reading efficiency
- YARC: reading comprehension

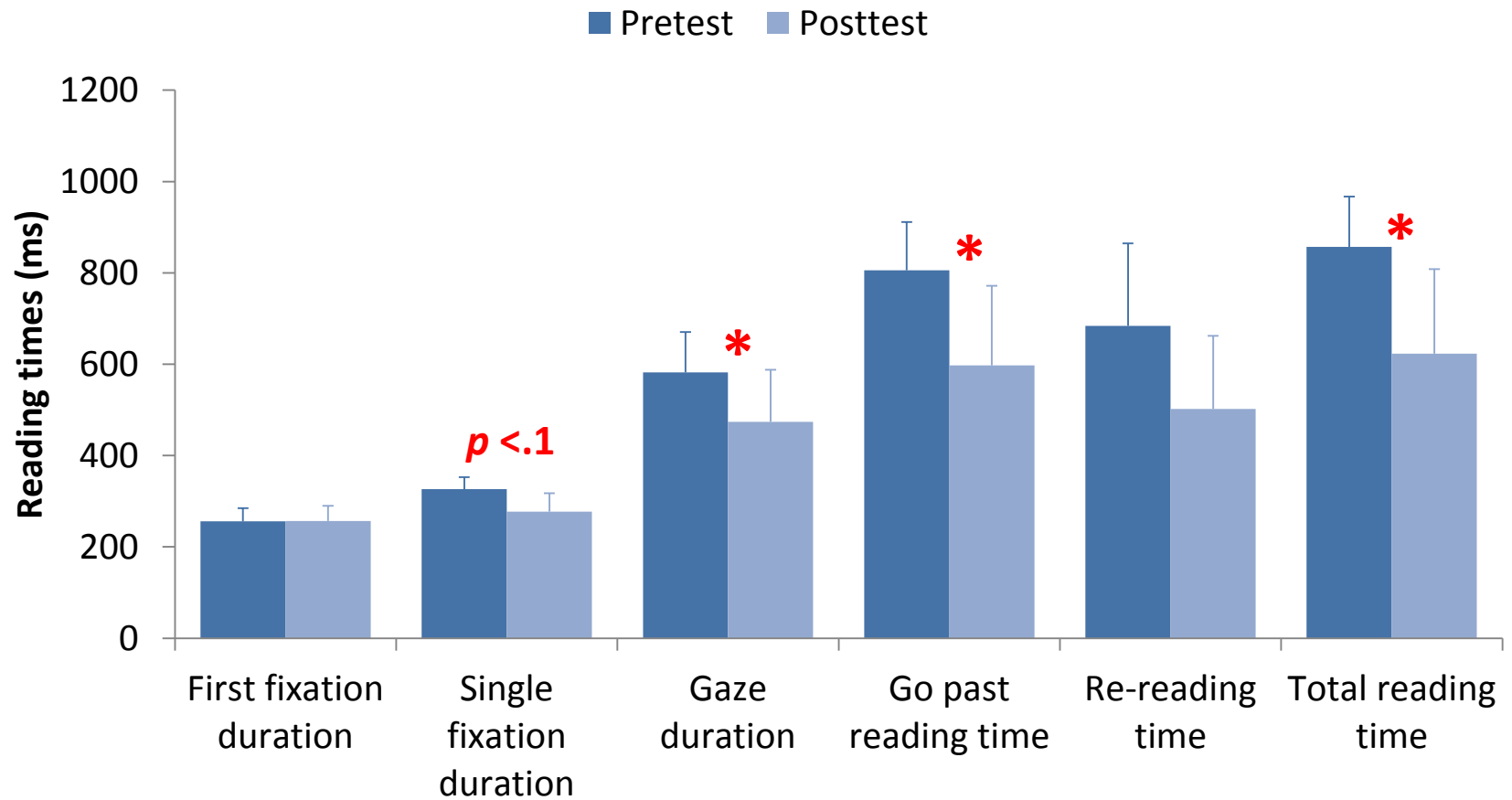
Day 2

- Training 2
 - 30 informative sentences
 - Low/high contextual diversity
- Post-test
 - 6 neutral sentences
 - 6 informative sentences
- Offline post-tests
 - Spelling
 - Cloze
 - Does it make sense?

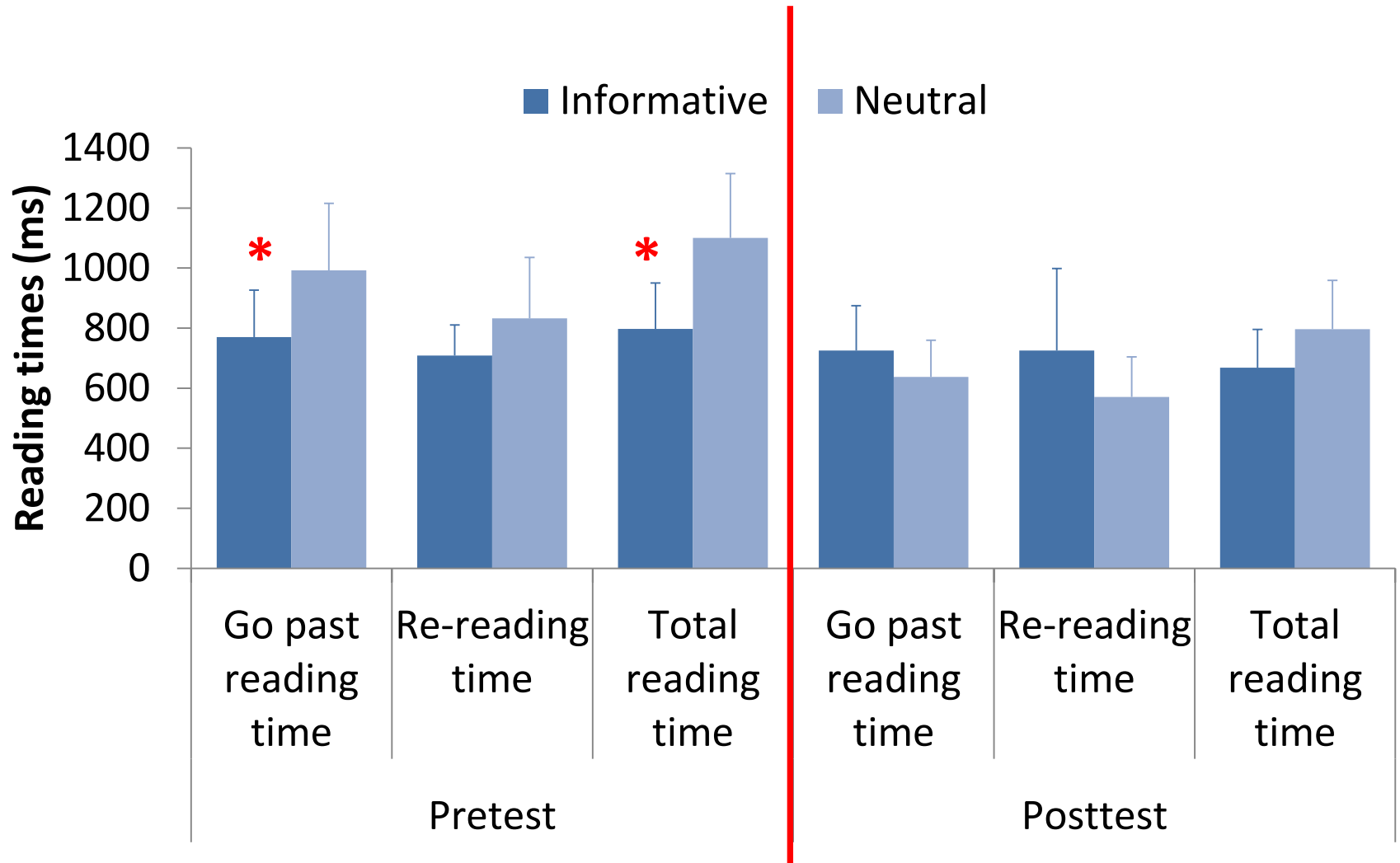
Results: Do children learn?



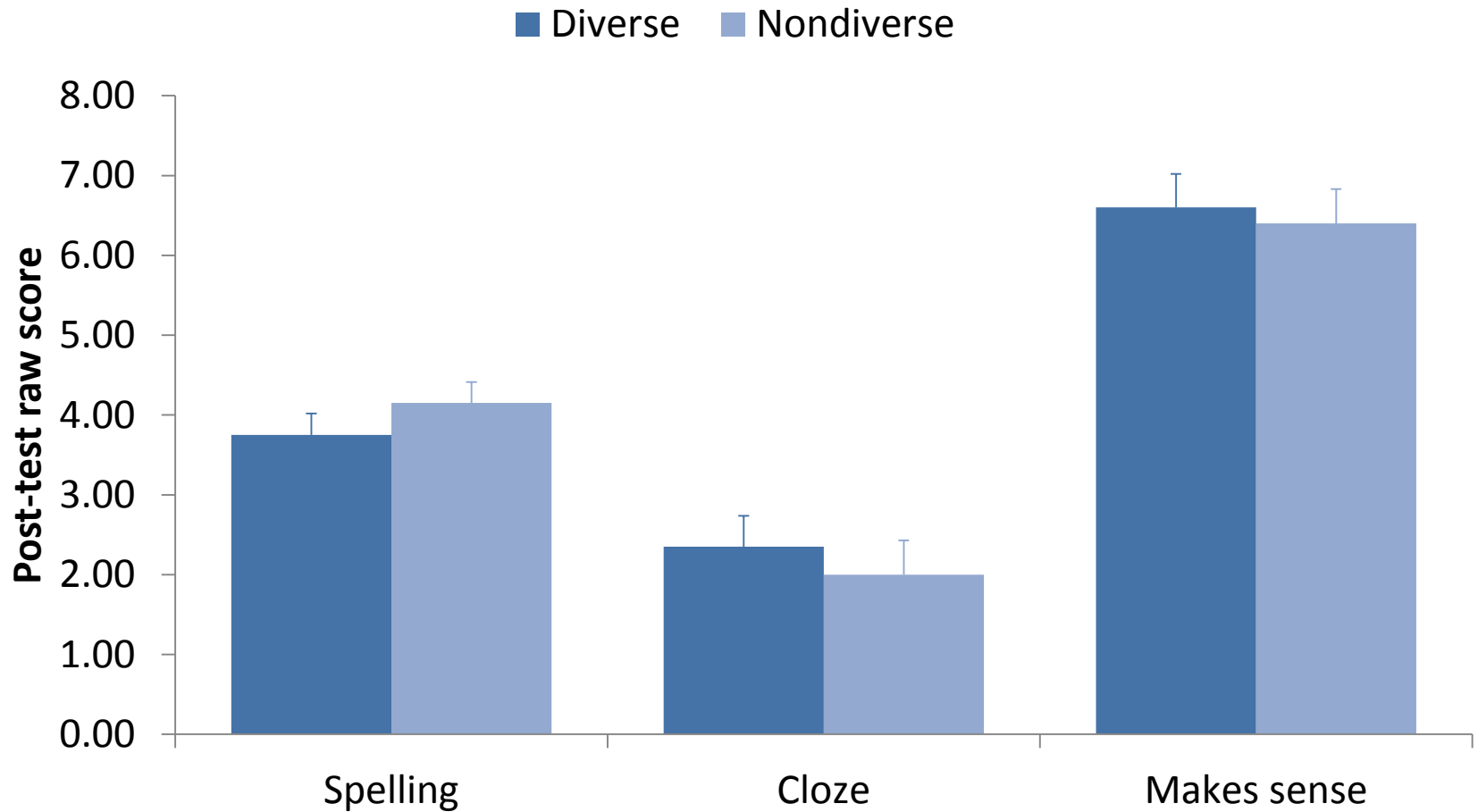
Results: Do children learn?



Results: Does informativeness of context affect reading behaviour?

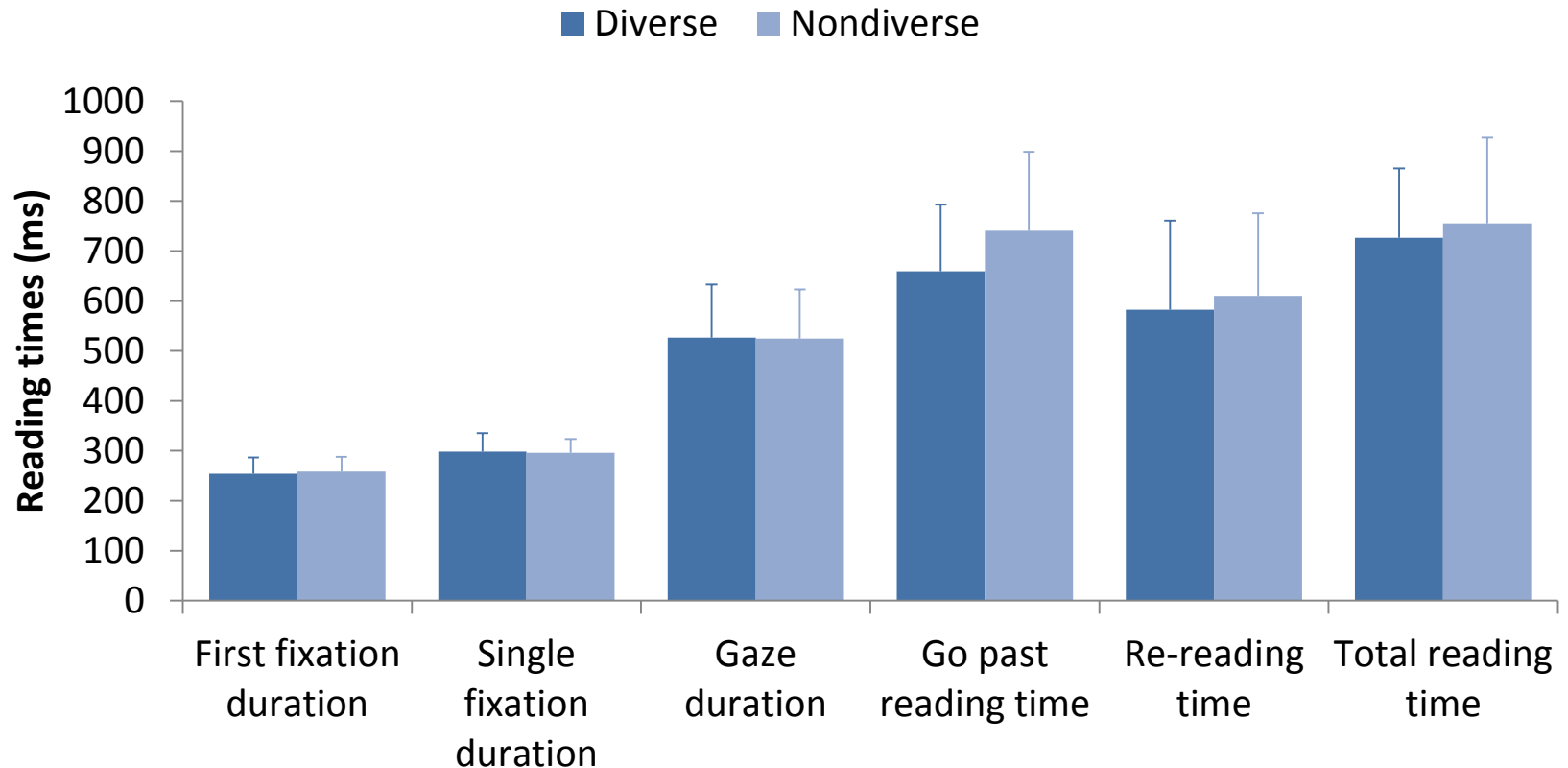


Results: Do diverse contexts help learning?



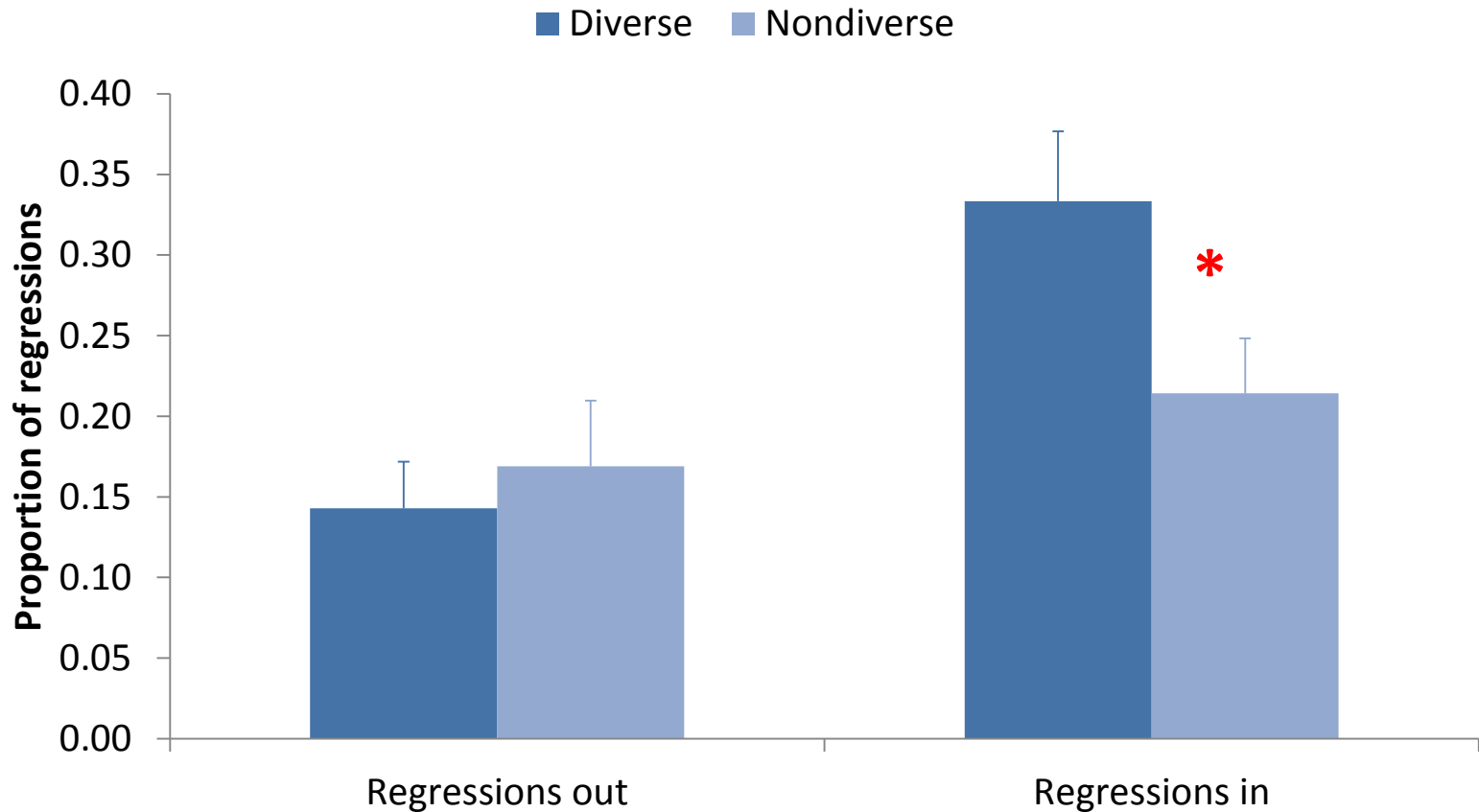
Results: Do diverse contexts help learning?

- Reading times at post-test

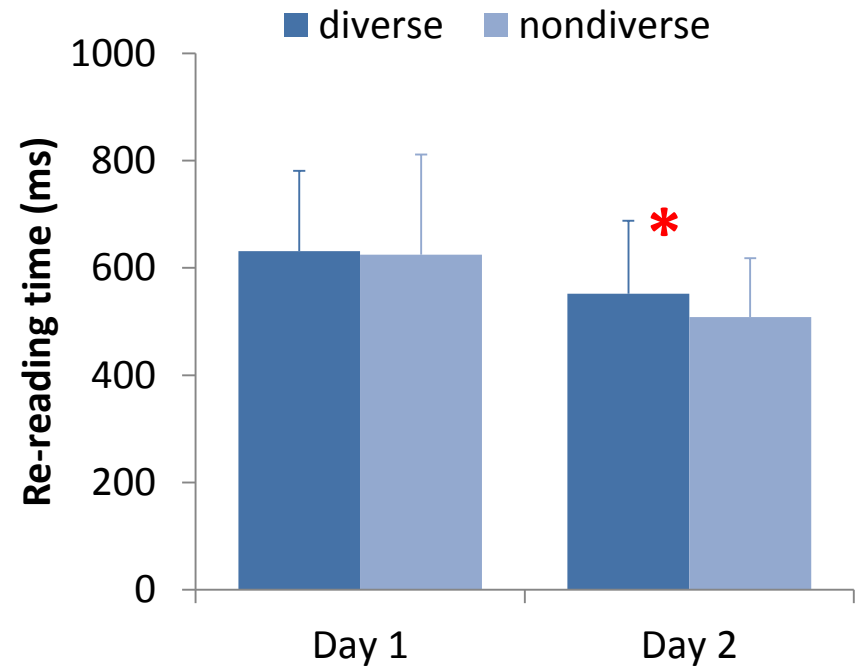
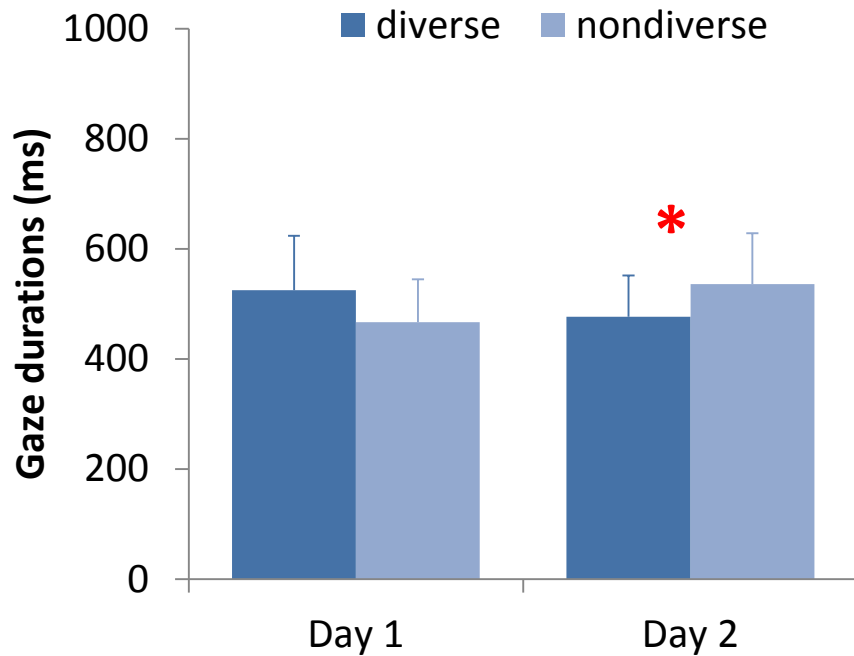


Results: Do diverse contexts help learning?

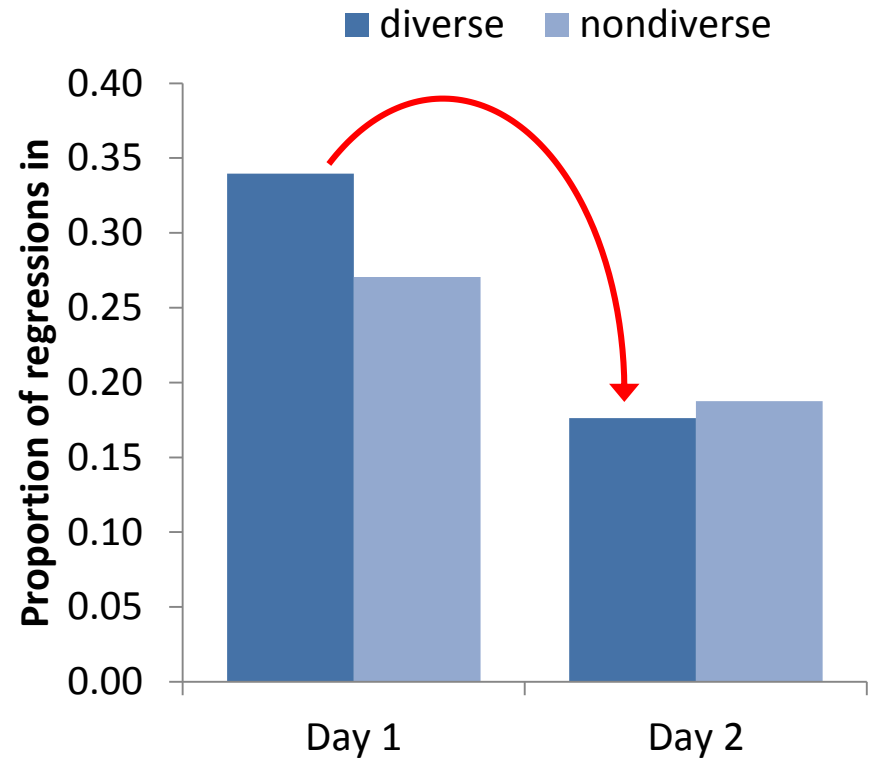
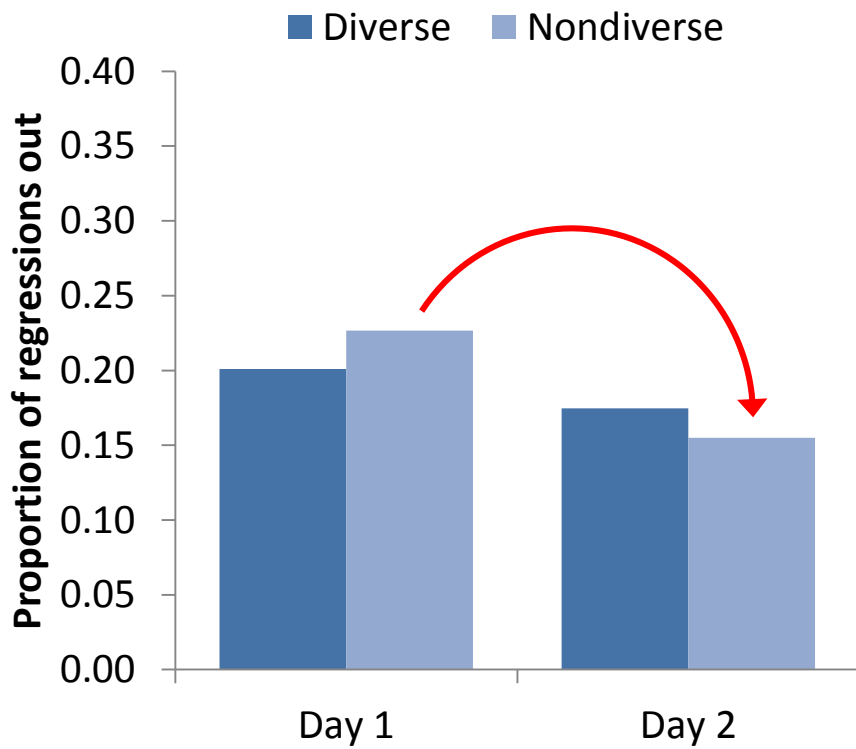
- Regressions (at post-test)



Training: Reading times

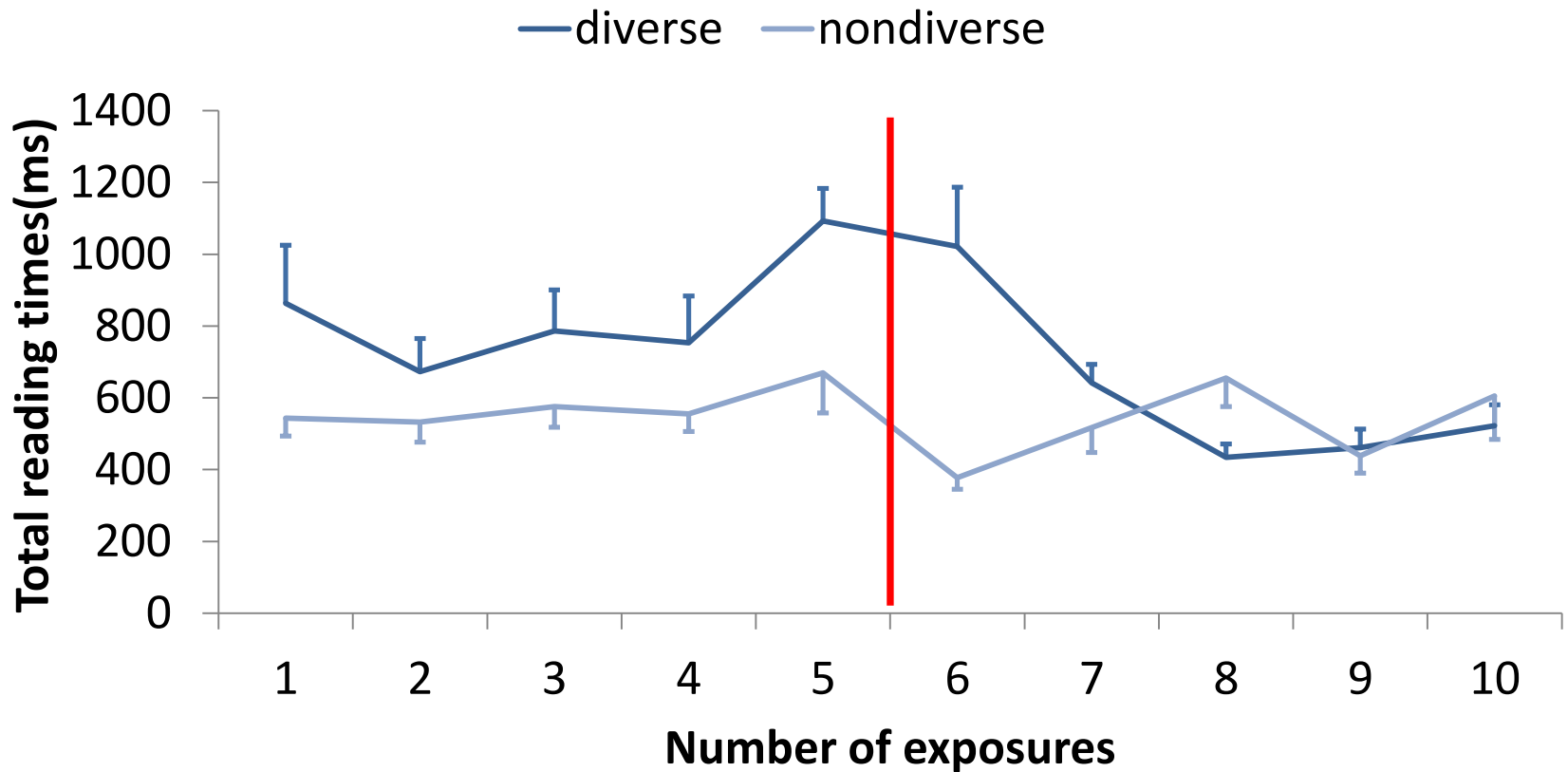


Training: Regressions out and in



Training: Reading times

- languished



Conclusions

- Do children learn new word meanings incidentally through reading?
 - Good orthographic learning
 - Children discriminated the meanings of novel words from one another fairly well
 - Difficult post-tests (discriminating from competing novel words rather than from known words)
 - Large difference in reading times from pre- to post-test even in neutral sentences

Conclusions 2

- Does the informativeness of a context affect reading behaviour at pre and post-test?
 - Yes: children (like adults -Brusnighan, 2015) adapt their reading behaviour in response to different types of contexts at different stages of learning
 - Sensitive to how informative/redundant a context is

Conclusions 3

- Does contextual diversity affect incidental word learning during reading?
 - No strong evidence for this (online or offline)
 - Contextual diversity \neq semantic diversity?
 - Needs more exposures/more diversity?
 - Not enough power?
 - However, we do see some evidence of a contextual diversity effect *during* training
 - What is the result of this? Different paths to same end point?
 - Differences between training and test?
 - Relationship between contextual diversity and informativeness?

What next?

- More participants
- More analyses
- Individual differences

Thank you

- Children and staff at St Nicholas Primary School, Oxford
- Research assistants: Katie Gray, Tom Smejka
- Funding: EPS



St Nicholas'
Primary School

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