

WHAT'S IN A STORY? CHILDREN'S LEARNING OF NEW WRITTEN WORDS VIA READING EXPERIENCE

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Overview

- ❖ Background
- ❖ Experiment 1 *A novel paradigm*
- ❖ Experiment 2 *Effects of semantics*
- ❖ General discussion

Orthographic learning

From unfamiliar to well-known

When does a novel word become a word?

... when it starts to behave like real words do.

- ◆ **What we know:** Real words behave differently from nonwords when used as masked primes in a lexical decision task

(e.g. Davis & Lupker, 2006)

Prime-Lexicality Effect

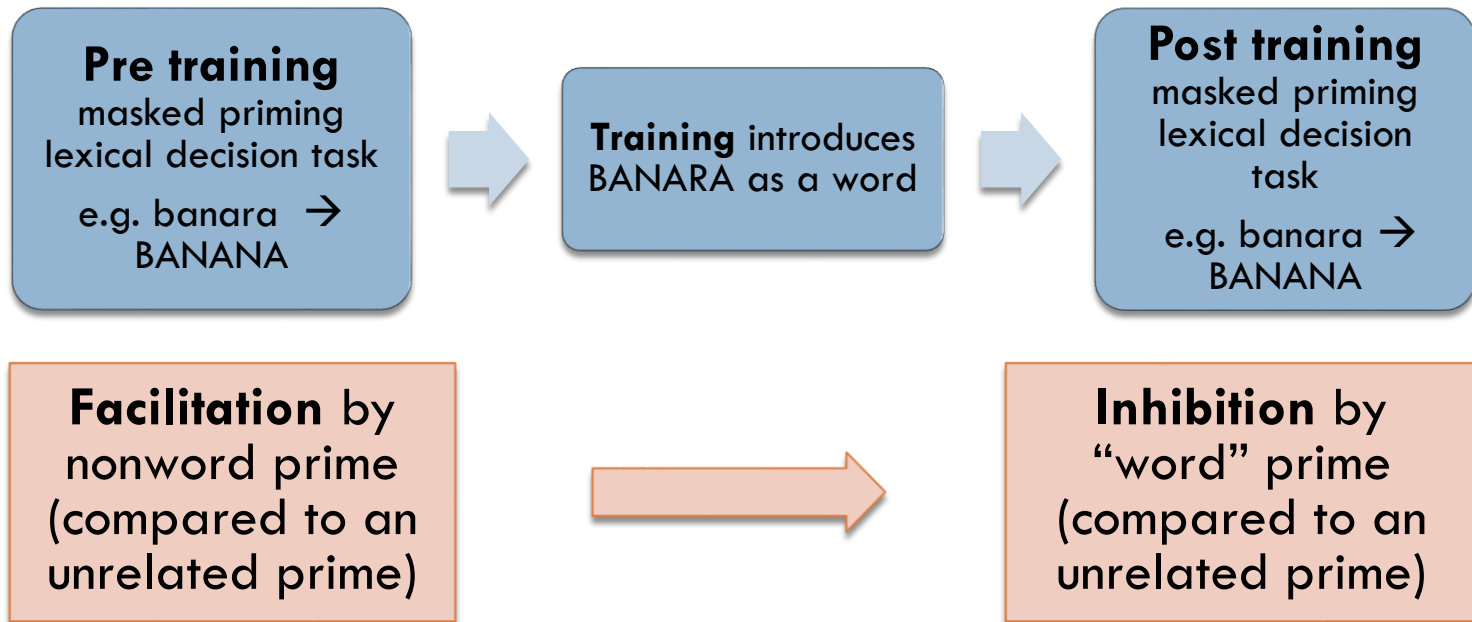
- ◆ A related nonword prime can **facilitate** responses to the target
 - ◆ stor → STAR
- ◆ A related word prime can **inhibit** responses to the target
 - ◆ stir → STAR

→ Due to lexical competition between the two activated entries

Prime-Lexicality effect as a novel measure of learning

General paradigm:

- Train participants on novel words
- Compare priming effects before and after training
 - ▣ Can we induce a “switch” from nonword to word behaviour?



Demonstrated in adults ONLY if training includes **semantics** for novel words (Qiao & Forster, 2012)

Application to Orthographic learning in children

Stimuli: 20 prime-target pairs (10 per counterbalanced list)

Prime	Target
bruit	FRUIT
pillage	VILLAGE
incite	INVITE
propel	PROPER
...	...

Training words: Rare words
unknown to children
("nonwords")

Base words: High frequency
neighbours known by children

- Important: No other orthographic neighbours
"hermits that only have each other"

Measures

Pre-test

- ◆ **Masked priming lexical decision**

Post-test

- ◆ Definition knowledge
- ◆ **Masked priming lexical decision**
- ◆ Orthographic decision
- ◆ Spelling

Experiment 1: sample

- 20 Year 5 and Year 6 children
- Data collected at 3 different schools at different points in time
- Masked priming results controlled for varying levels of word reading ability

Story materials

- No explicit definitions of Training words
- 4 exposures per word
- Recurrent characters to make the stories engaging and real-world like

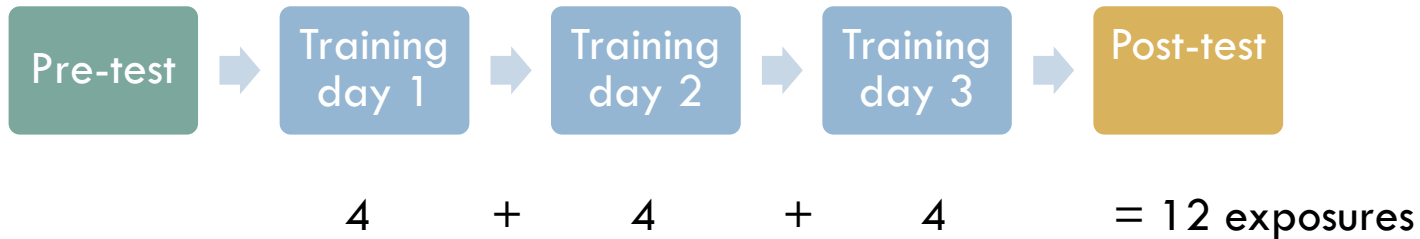


Training: Stories read aloud by children with feedback on training word pronunciations

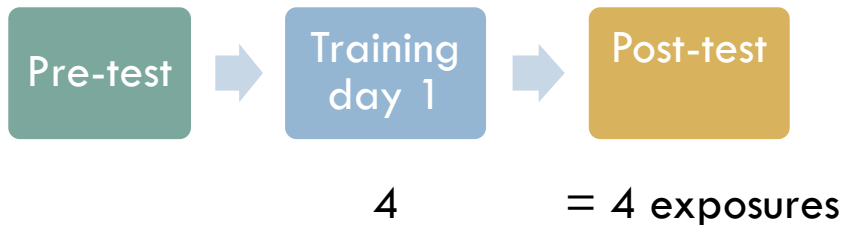
Experiment 1: No of exposures

Between-subjects manipulation

□ Multiple Sessions ($N = 10$)

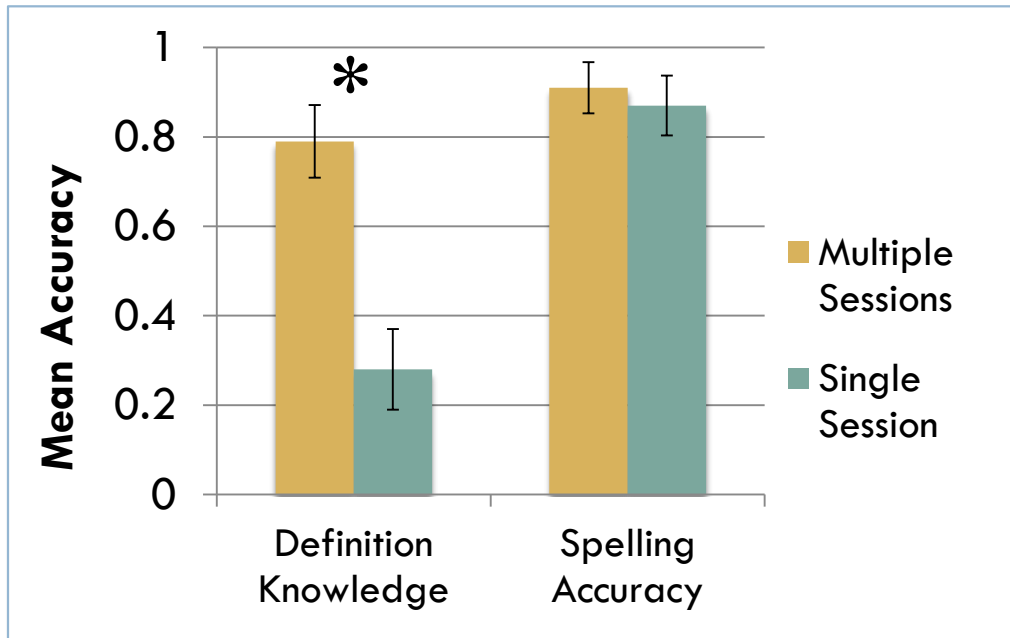


□ Single Session ($N = 10$)



Explicit measures of meaning and form learning

Definition and Spelling recall

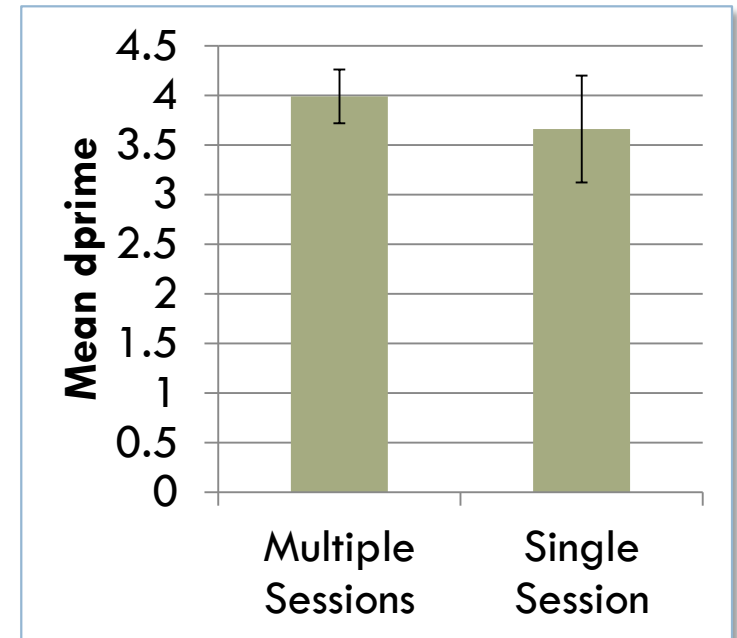


$p < .001$

$p = .982$

Orthographic decision task

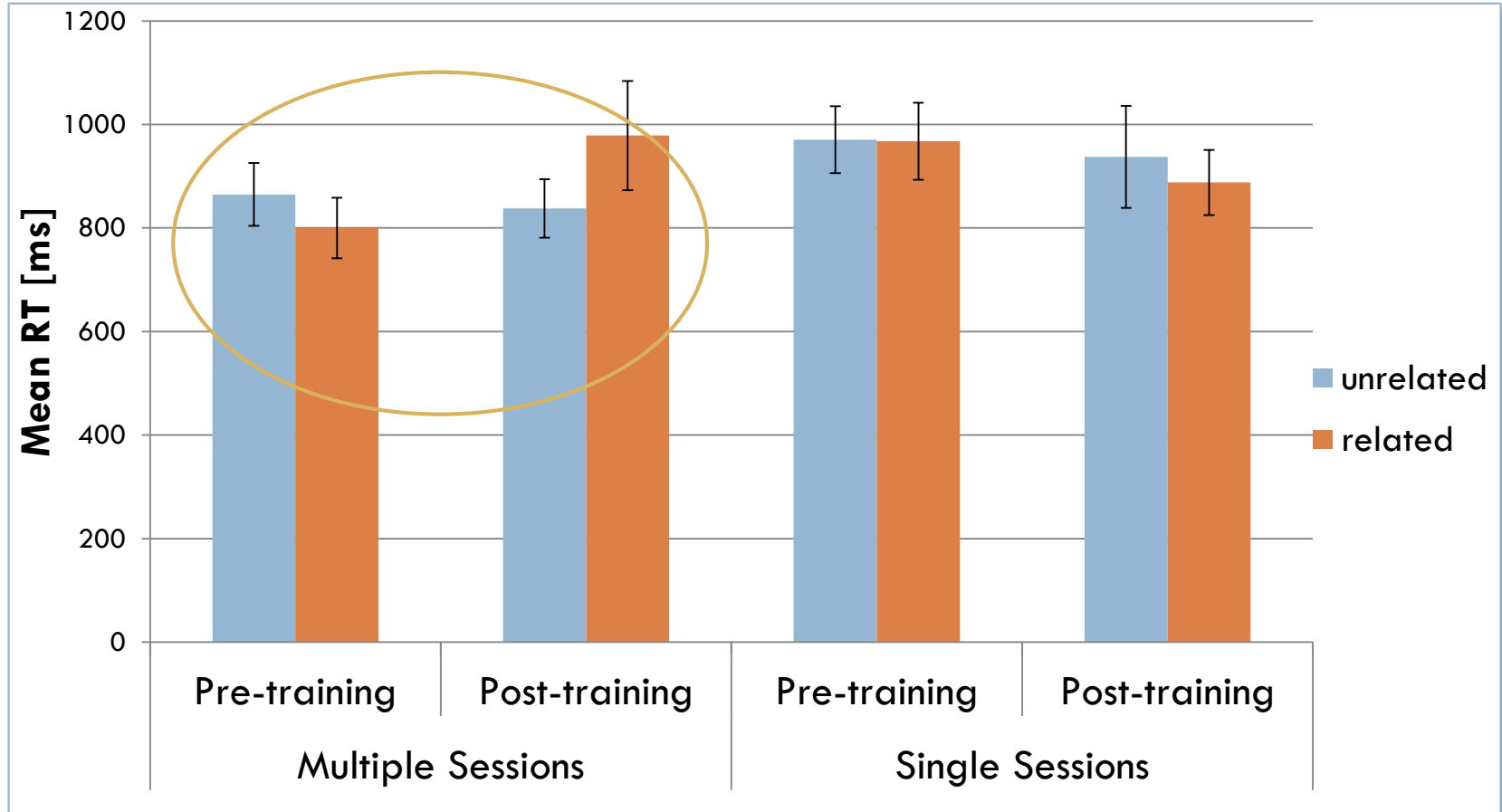
(ability to discriminate right spelling from wrong)



$p = .217$

- Single Session leads to poorer **meaning** acquisition. Explicit **form** learning is just as good as multiple sessions.

Does training induce lexical competition?



Condition x Session x Prime-Target relationship interaction: $t = -2.4$ (controlling for general word reading efficiency)

Pairwise comparisons reveal significant 2-way interaction for multiple sessions condition

Experiment 1: Summary

- Significantly poorer explicit learning of word **meanings** after 1 session compared to 3
- Equally good explicit **form** learning
- Prime-lexicality effect only emerges after 3 sessions
 - Suggests that words are not sufficiently lexicalised to cause inhibition after just one session

➤ More exposures are necessary to show a marker of lexicalisation than to succeed on explicit tasks

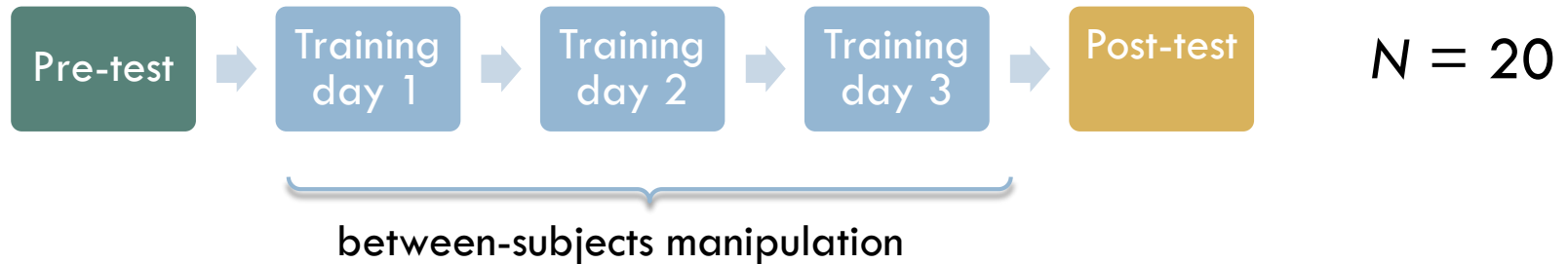
(Limitation: No baseline pre-training comparison on explicit tasks)

Experiment 1: Discussion

Why does the PLE only emerge after 3 sessions?

- ▣ Is it just about **frequency**/print exposure?
- ▣ Further **consolidation** from episodic to LT memory?
- ▣ Maybe **semantics** are crucial (cf. Qiao & Forster, 2012), as after single session, semantic learning was poor
 - Investigated by Experiment 2

Experiment 2: Effects of semantics during training



Stories condition

- Identical to “Multiple Sessions” condition: Read stories aloud

Lists condition

- Words from the stories in random order, with function words removed.

No. of exposures constant

Experiment 2

Help for Sara

Today Sara was not looking happy. Billy asked her what was wrong.

“My parents told me that we are going to visit my aunt and uncle in Sweden,” she explained.

“That sounds fun,” Rachel suggested. “Don’t you like them?”

“I do. My cousins are very funny,” Sara replied.

“Then why aren’t you happy?” Jimmy asked.

“I am scared of flying,” Sara admitted.

“We must try to allay Sara’s fear of flying,” Rachel insisted.

The others agreed to try to allay her fears.

“Why are you scared?” Billy asked.

“I have never flown before. I don’t know what it will be like,” Sara explained.

“I’ve flown before,” Jimmy said, “I can tell you about it. Maybe that will allay your fears.”

“Me too!” Rachel chimed in.

Rachel and Jimmy told Sara all about their plane journeys to allay her fears. Sara looked much happier.

“I am glad I talked to you about it. I am less scared now,” she said.

asked

happy

going

flown

looked

now

fears

replied

flying

funny

plane

allay

chimed

help

told

scared

suggested

looking

fear

sounds

try

happier

allay

before

said

asked

aunt

said

explained

wrong

cousins

try

scared

visit

flying

allay

never

glad

told

admitted

tell

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talked

fears

allay

scared

explained

fears

Sweden

today

flown

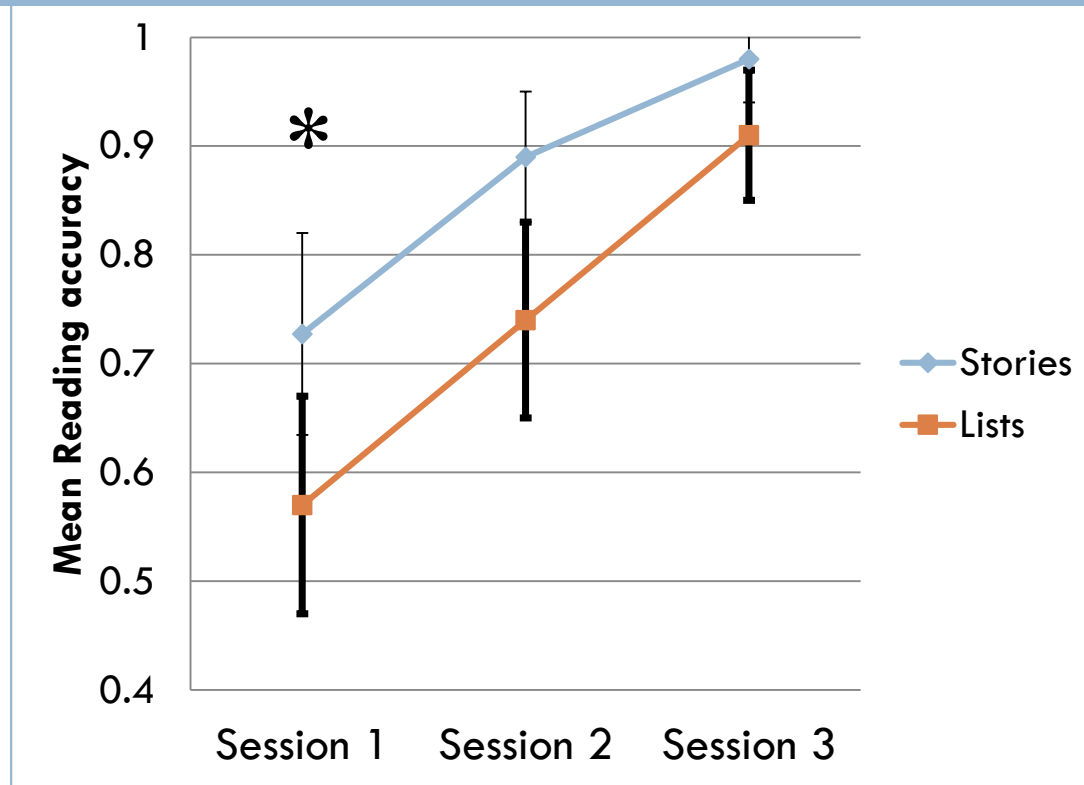
agreed

happy

fun

uncle

Reading accuracy during training



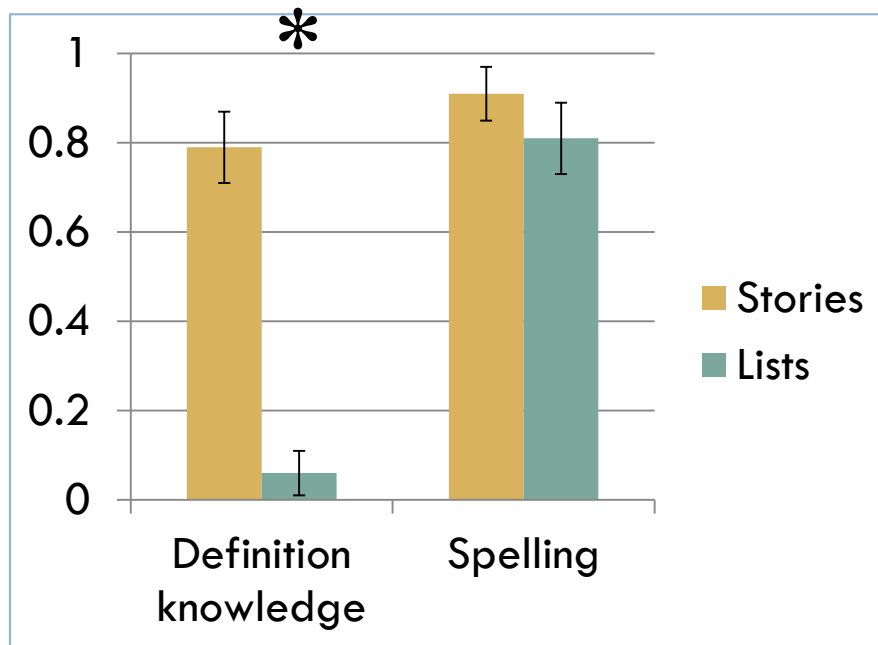
Main effect of test session ($p = .034$)

Main effect of Stories vs. Lists ($p < .001$)

Pairwise comparisons reveal difference is **only significant at Session 1**

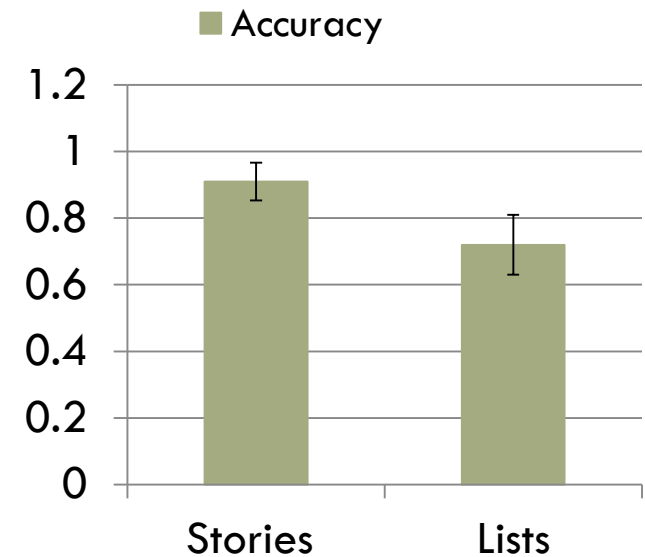
Explicit measures of meaning and form learning

Definition and Spelling recall



Orthographic decision task

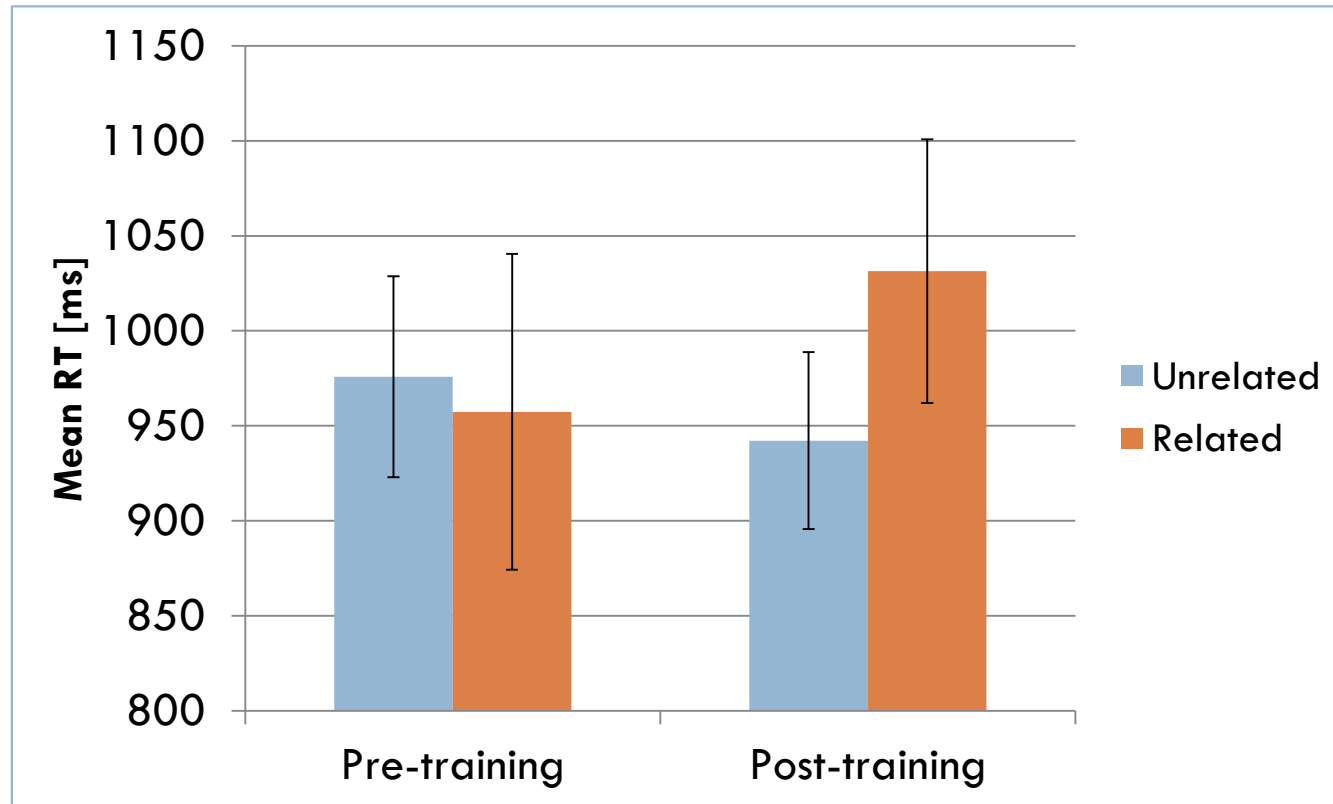
Word scored as accuracy if YES to correct spelling plus NO to all three foils



Not significant (controlling for general reading efficiency)

- Reading lists leads to poorer meaning acquisition. Explicit form learning is just as good as after reading stories.

Do semantics affect lexical competition?



PLE indicated by Session x Prime-Target relationship interaction: $t = 3.35$

No three-way interaction with training condition – PLE irrespective of Lists or Stories

Summary of Exp. 2: What happens if we take away semantics?

- By session 2, words were read equally accurately
 - Explicit form learning was not affected
 - Emergence of lexical competition was not affected
- Converging evidence against a semantic benefit for Orthographic learning when novel word meanings are introduced via context at the same time as novel forms

Why does it look like semantics are unnecessary?

- Is there a confounding benefit of reading words in **isolation** in the list condition (cf. Landi et al. 2006)?
- Reading novel words in lists among known words gives a clear indication that one is dealing with real words, not nonwords. Plus **lexical phonology** is provided ('very weak semantics') and emphasised by feedback on pronunciations.
- Or is simple **exposure to orthographic form** sufficient for children aged 9-11?

Overall conclusions

- Prime-Lexicality effect was found in two separate samples using an ecologically valid incidental learning paradigm, training on real words
- PLE was sensitive to gradual differences in lexicalisation not tapped by traditional explicit measures (Experiment 1)
- Evidence for a semantic benefit for orthographic learning remains elusive (Experiment 2)

Thank you!

- Kate Nation & Anne Castles
- Economic and Social Research Council for studentship funding
- Staff and children at St. Ebbe's CE Primary school, Oxford, St. Patrick's Catholic Primary school, Leamington Spa, Dr. South CE Primary school, Islip, & Middleton Cheney Primary Academy
- Bob McMurray & Sachiko Kinoshita for helpful discussion