

Speaker Information in Spoken Word Recognition: An Investigation Using False Memories

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Introduction

- Models have assumed non-linguistic information (e.g. speaker identity) is not contained in a word's mental representation (Pisoni, 1997).
- Based on findings that speaker information can affect processing, **episodic models** suggest speaker information is part of word representations (Goldinger, 1998).
- Attention to talker **identity** during encoding may be critical for observing speaker effects (Theodore, Blumstein & Luthra, forthcoming).
- Activating a word partially activates related words (Figure 1).
 - Similarly, individuals falsely recognize words related to ones they studied (Roediger & McDermott, 1995; Sommers & Lewis, 1999).
- Question: Just as linguistic information can spread through a word network, can speaker information permeate a network and affect the processing of unstudied words?**

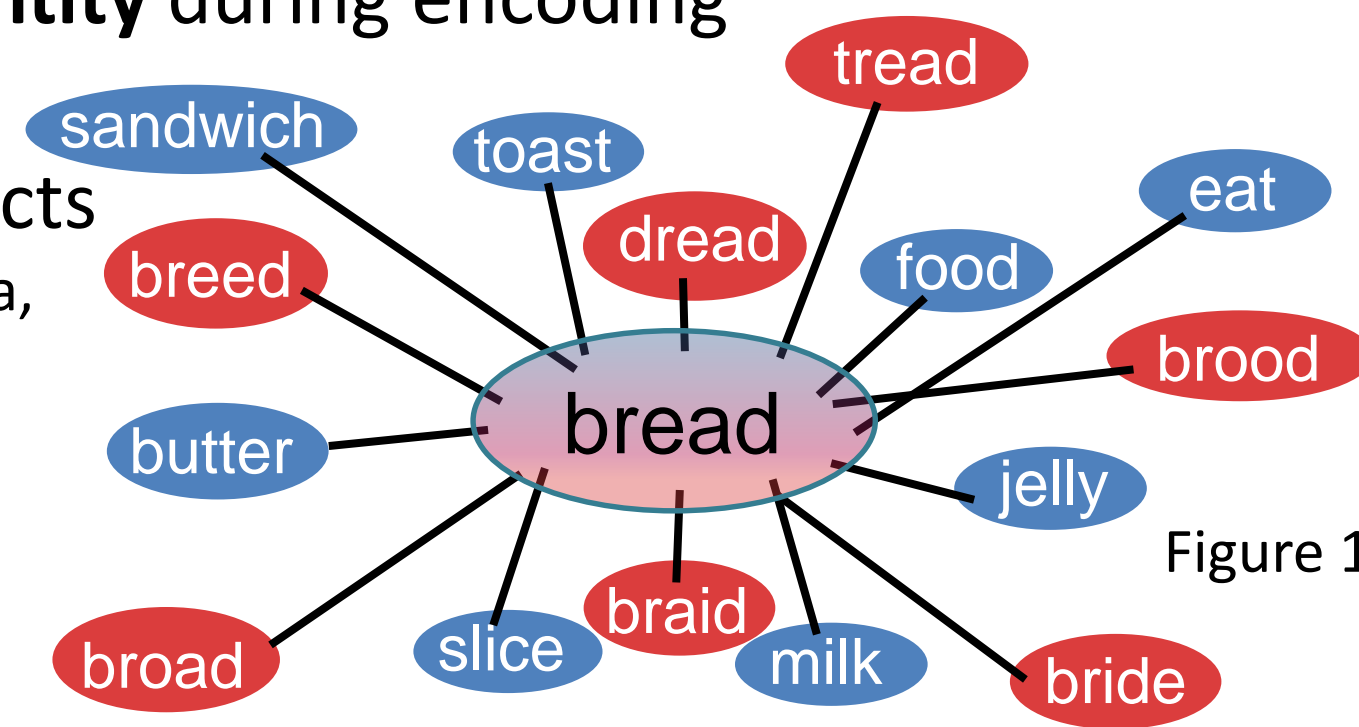
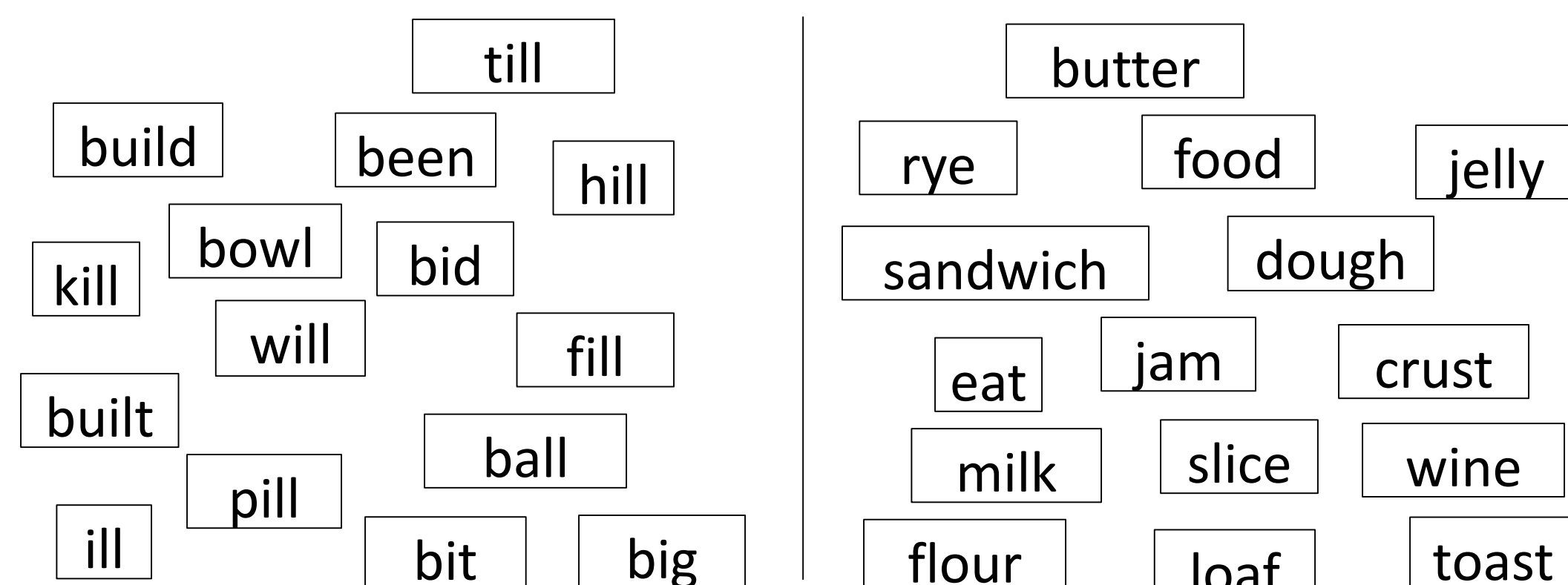


Figure 1

Experiment 1: Methods

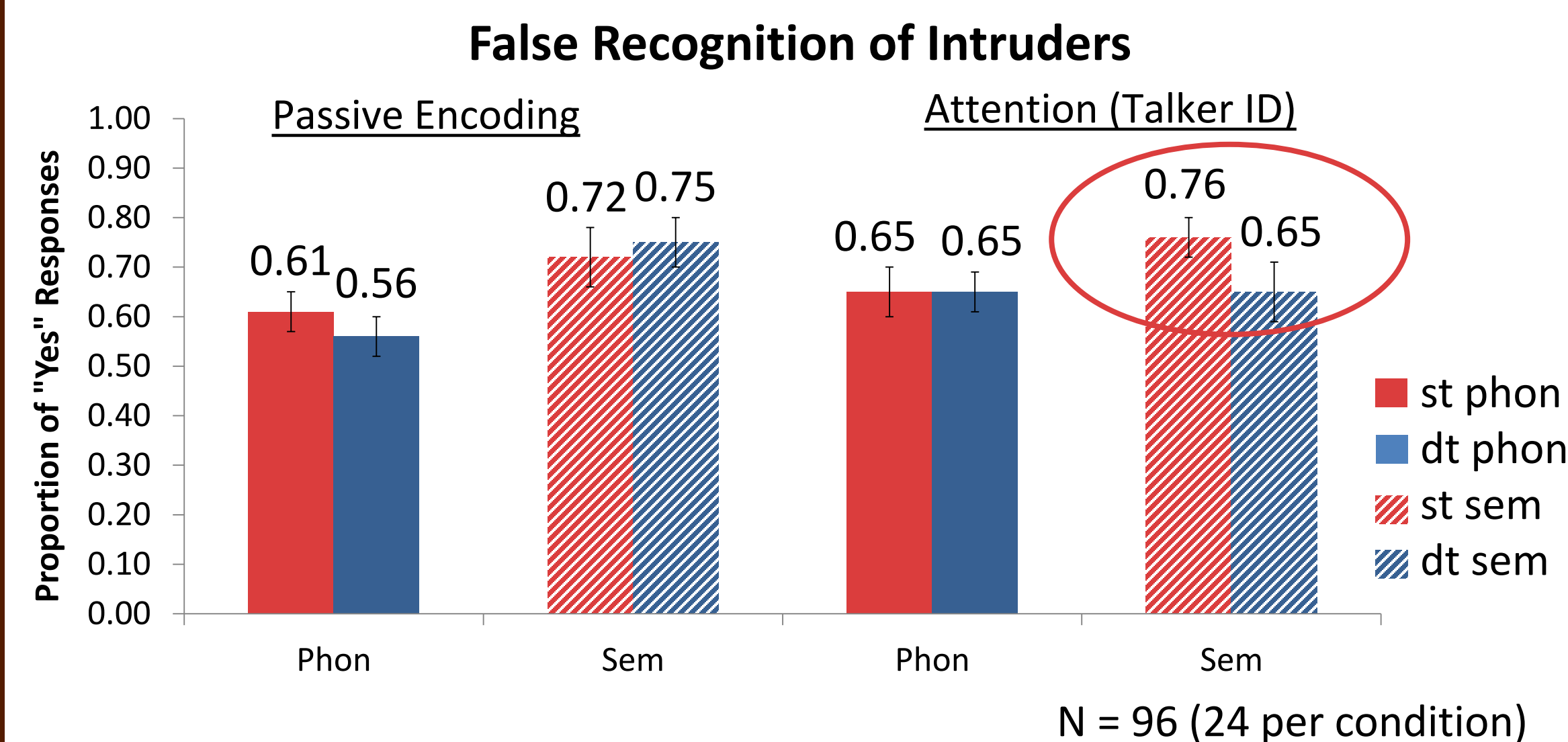
- Subjects studied 12 lists designed to induce false recognition of an unstudied **"critical intruder"** (CI). Each list was spoken by a male or female. Half the subjects passively encoded study items, and half were asked to pay attention to the talker of each word.
- Half received lists where items related to the CI by sound, and half studied lists where items related in meaning.



- Subjects are given an auditory recognition test, with items produced by the same talker (st) or different talker (dt).

Did you hear: "will"? (studied) "sin" (filler) "bill"? (critical intruder) | Did you hear: "milk"? (studied) "anger" (filler) "bread"? (critical intruder)

Experiment 1: Results



Congruent speaker information **boosted false recognition of semantic CIs** when subjects actively encoded talker identity. In contrast, speaker information did not affect recognition of studied items (not shown).

It may be easier to observe speaker effects on CIs than on studied items because the CI is the **"hub"** of the network.

Given that meaning is accessed after sound is analyzed, why are effects observed for semantic but not phonological lists?

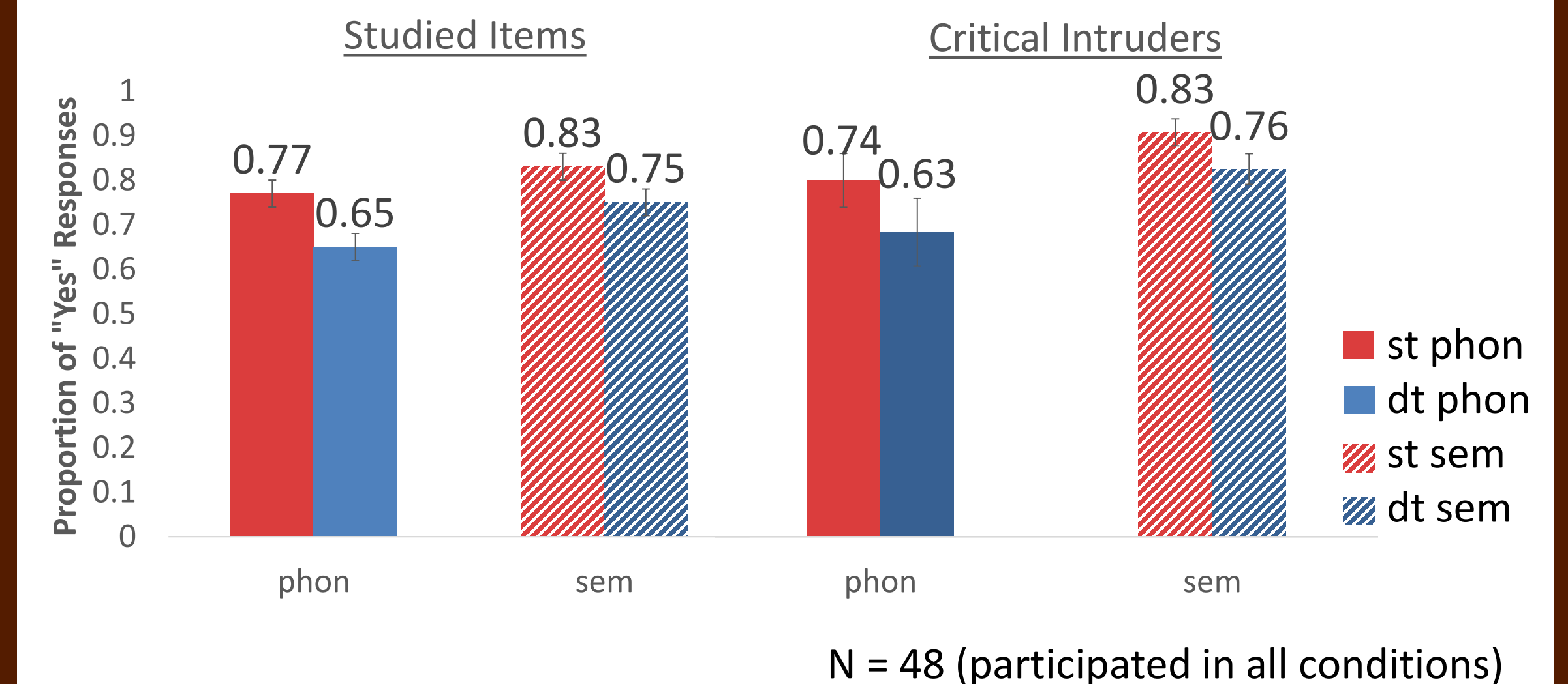
- In Experiment 1, phonological lists overlapped – a word (e.g. "sill") might be closely related to two CIs (e.g. "sail" and "bill")
- Experiment 2 tested whether this overlap obscured potential speaker effects. To this end, we altered the phonological lists to reduce the overlap of sounds between lists.

Experiment 2: Methods

stops	nasals	liquids and glides	fricatives
bug	moon	yell	size
bite	nine	wool	siege
boot	mean	wear	cease
bat	man	wall	these
bet	mime	will	sage
buck	moan	wail	save
CI: but	CI: mine	CI: well	CI: seize

- All attended to talker ID during encoding. All subjects received both phonological and semantic lists.

Experiment 2: Results



As shown by a main effect of talker, congruent speaker information **boosts recognition of studied items and false recognition of CIs for both phonological and semantic lists.**

Conclusions

- Consistent with episodic models, speaker information is **preserved in lexical representations.**
- This information can **affect the processing of nearby unstudied words (CIs)** – specifically, speaker congruency enhances recognition of these nearby items.
- Effects of speaker information are seen in both the analysis of sound and the analysis of meaning.
- The findings support the idea that paying attention to speaker identity is critical for observing effects of speaker information.

References

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