



# Infants' memory for similar sounding words: Phonetic false memories

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## INTRODUCTION

One feature of the memory system is its tendency to conflate similar items. Thus, a person who hears a list of words such as tired, night, dream, yawn, bed, rest, relaxing, and quiet, will tend to recall also hearing the word "sleep" (Bartlett, 1932; Roediger & McDermott, 1995). Much the same effect has been reported for phonetic "neighbors" of a word (Sommers & Lewis, 1999). Phonological neighbors are words that differ by one phoneme from a target word. Such effects have been interpreted in the light of various activation-based models (such as the Neighborhood Activation Model of Luce & Pisoni, 1998), fuzzy-trace theory (Reyna & Brainerd, 1995), and Schacter, Norman, & Koutstall's (1998) Constructive Memory Framework. While the specifics of these accounts are debatable, the question remains as to how and when such similarity-based networks develop.

### Do infants also exhibit phonological false memories?

#### STUDY 1

- 1) The headturn preference procedure was used to familiarize 15-month-olds with two **dense** phonological neighborhoods that were constructed of CVC non-words that differed in the initial consonant, the vowel, or the final consonant of two target words (see high density condition in Table 1, targets are underlined).
- 2) Infants were tested on their preferences for the two target words or two unrelated words. Lists were controlled for phonotactics, frequency, and their relation to English phonological neighborhoods.

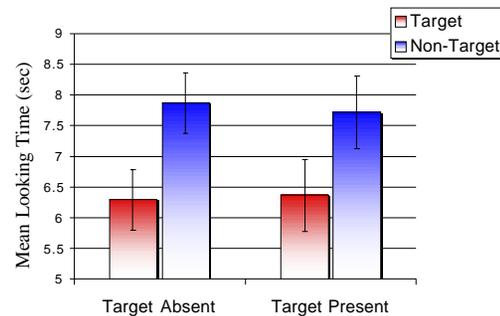


Figure 1. Mean looking of 15-month-olds (N = 52) to target and non-target words. Bars represent SE.

TABLE 1: Sample list of lexical neighbors.

High Density			Low Density	
<u>Tirb</u>	<u>Pawch</u>		<u>Tirb</u>	<u>Pawch</u>
thirb	puch		hoyv	tav
tib	pawth		deeve	weem
tahb	pawng	**	tahb	pawng
tirsh	paych		koys	fahsh
lirb	thawch		laze	cheth
tirrh	pawsh		nith	soyng
tuhb	nawch	**	tuhb	nawch
shirb	pawv		rauch	thich
tirng	rawch		shawg	muhl
toyb	pech	**	toyb	pech
mirb	poych		zope	bauch
tirch	sawch		girj	koeth

#### Study 1 Results

- Unlike in the traditional version of this paradigm, infants showed a novelty preference away from the target word (this was probably due to the high number of repetitions).
- This effect was observed whether or not the target was contained in the familiarization set.
- Thus, by 15 months, infants appear to be demonstrating "phonological false memories."
- They also appear profoundly sensitive to detecting similarities among words.

#### STUDY 2

### Are these infants even distinguishing among the neighbors?

Sommers and Lewis (1998) raise the idea that adults could "mishear" some of the neighbors as the target. This possibility would seem even more likely with infants. If true, then the previous effect was the result of misperception not false memories. To rule out this explanation, study 2 used abbreviated lists of only three neighbors and nine fillers. It was expected that the small number of repetitions should be well below that necessary to create a "false memory." In this case, infants should distinguish lists with the target from those without.

- 1) The headturn preference procedure was used to familiarize 15-month-olds (N = 52) with two **sparse** phonological neighborhoods (see low density condition in Table 1, targets are underlined) or two lists in which the target words were repeated three times.
- 2) Infants were again tested on their preference for the two target words or two unrelated, non-target words.

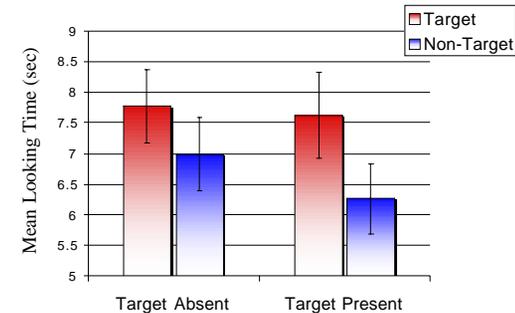


Figure 2. Mean looking times to the target and non-target for each of the groups. Bars are SE.

#### Results

- A familiarization preference was significant only in the case where infants were actually exposed to the target words.
- Thus, although infants appear to be sensitive to the similarities among the words, they are able to distinguish between the phonological neighbors (see Juszyk & Aslin, 1995).

#### CONCLUSIONS

- When exposed to a large number of similar sounding words, infants, like adults, tend to misremember which ones they have actually heard.
- They do this despite evidence that infants can make and remember fine phonetic distinctions between words.
- This suggests a system of memory that structures itself based on similarity, from the beginning of language acquisition, even before infants have learned the full lexicon and with a minimum of exposure to the new neighborhood.

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This work sponsored by NICHD (15795) & NIMH (01490) grants to PWJ, and NIDCD (0265801) grants to PAL.

## References

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- Bartlett, F. (1932). *Remembering: A study in experimental and social psychology*. Cambridge, England: Cambridge University Press.
- Jusczyk, P. W., & Aslin, R. N. (1995). Infants' detection of the sound patterns of words in fluent speech. *Cognitive Psychology*, 29, 1-23.
- Luce, P. A., & Pisoni, D. B. (1998). Recognizing spoken words: The neighborhood activation model. *Ear & Hearing*, 19, 1-36.
- Reyna, V. F., & Brainerd, C. J. (1995). Fuzzy-trace theory: An interim synthesis. *Learning and Individual Differences*, 7, 1-75.
- Roediger, H. L., & McDermott, K. B. (1995). Creating false memories: Remembering words not presented in lists. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 21, 803-814.
- Schacter, D. L., Norman, K. A., & Koutstaal, W. (1998). The cognitive neuroscience of constructive memory. *Annual Review of Psychology*, 49, 289-318.
- Sommers, M. S., & Lewis, B. P. (1999). Who really lives next door: Creating false memories with phonological neighbors. *Journal of Memory and Language*, 40, 83-108.