

# Recall predicted by reduction in intensity but not duration: Implications for theories of prominence

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## RESEARCH QUESTION

What drives prosodic prominence & reduction?

- > Single source theories: repetition<sup>1</sup>, predictability<sup>2</sup>, etc.
- > Multiple Source Account<sup>3</sup>: More than one cognitive process

Evidence from scene description tasks<sup>4</sup>:

- > **Predictability** mostly affects **intensity**
- > **Repetition** mostly affects **duration**

## PRESENT STUDY

Test influences on **reduction** through speaker's later **recall**

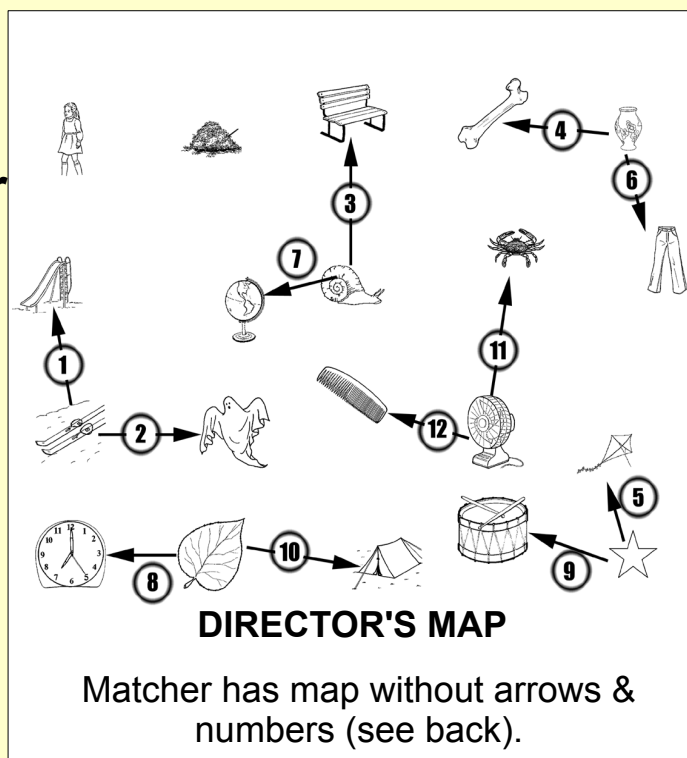
- > If **intensity** mostly reflects **explicit discourse representation**, **should** be related to recall
- > Distributed practice literature: Later recall better if first presentation not considered at time of second<sup>5</sup>
- > If **duration** mostly reflects **implicit production priming**, **should not** predict written recall

## TASKS

N = 21 pairs of naïve participants

### 1 Modified map task

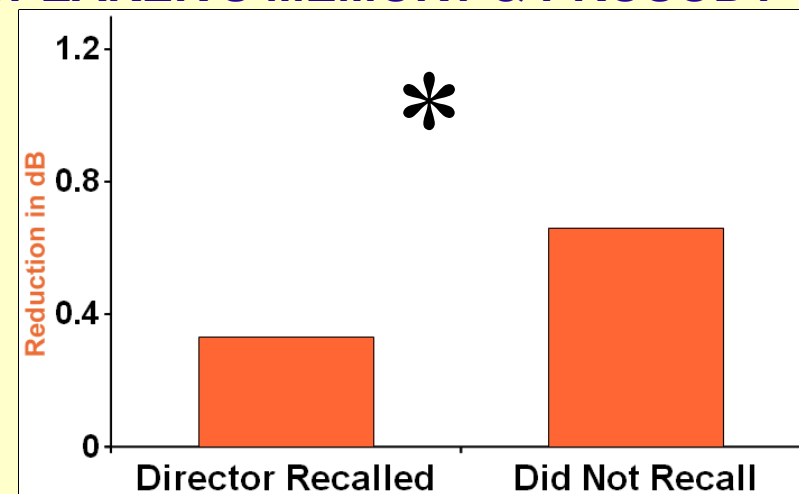
- > **Director** (speaker) tells image sequence to **matcher**
- > e.g. "Go from the skis to the slide"
- > Measure **reduction in prominence** between director's **2 mentions of each target**
- > Lag of 0, 1, or 3 instructions between mentions
- > 7 maps x 6 targets<sup>6,7</sup> each



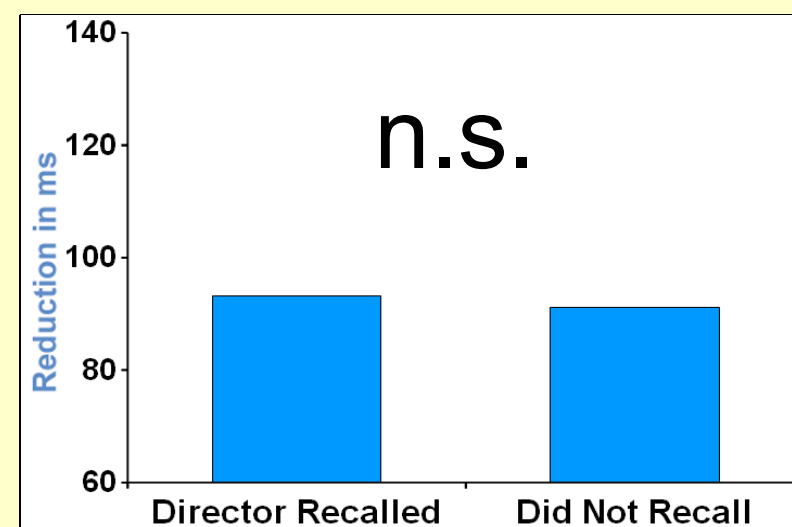
### 2 Free recall task

- > **Director** tries to **recall** items in **writing**

## SPEAKER'S MEMORY & PROSODY



**Intensity** reliably reduced in 2nd mention  
Degree of reduction **predicts** recall  
( $z = -2.06, p < .05$ )



**Duration** also reliably reduced,  
but **unrelated** to recall ( $z = 0.46, p = .64$ )

## CONCLUSION

- Reduction in **intensity predicts** recall
- > May reflect **discourse representation**
- Reduction in **duration does not**
- > May reflect **implicit production priming**

Consistent with multiple source account.

## REFERENCES & ACKNOWLEDGMENTS

See back side.

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# Additional Information

## MULTI-LEVEL MODEL

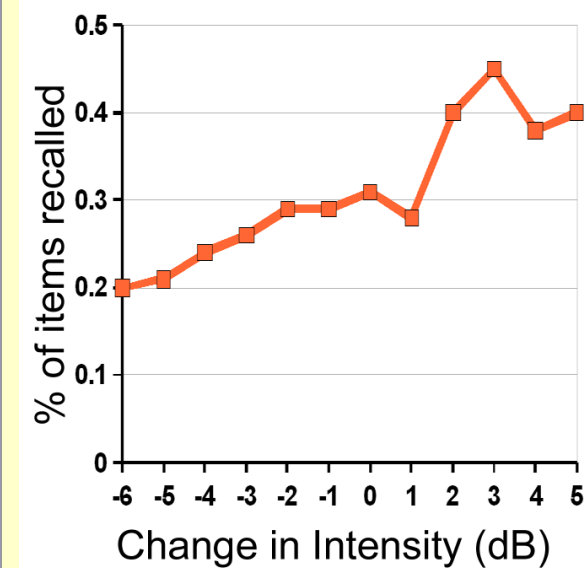
Model log odds probability of correct recall as a function of prosody, lag

Lag is coded as 2 orthogonal contrasts (massed vs. spaced, lag 1 spaced vs. lag 3 spaced)

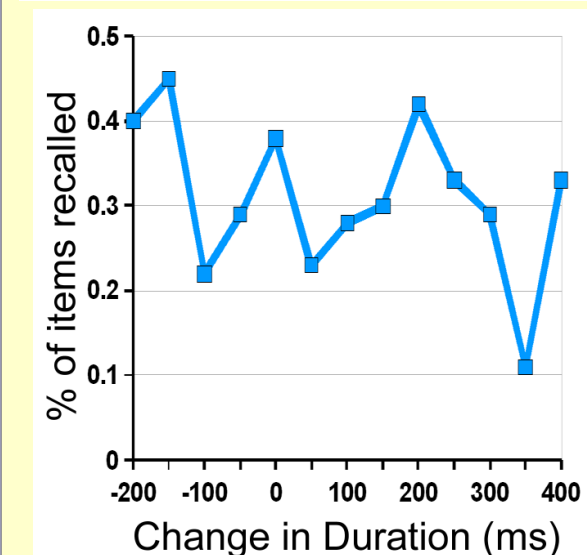
Centered all predictors

| FIXED EFFECTS                 | $\beta$       | SE           | z             | p          |
|-------------------------------|---------------|--------------|---------------|------------|
| Intercept                     | -1.010        | 0.192        | -5.245        | < .01      |
| <b>Spaced Lag</b>             | <b>0.475</b>  | <b>0.260</b> | <b>1.800</b>  | <b>.07</b> |
| Lag 3 vs. Lag 1               | 0.040         | 0.210        | 0.210         | .83        |
| <b>Reduction in Intensity</b> | <b>-0.096</b> | <b>0.047</b> | <b>-2.057</b> | <b>.04</b> |
| Reduction in Duration         | 0.000         | 0.007        | 0.464         | .64        |
| Intensity x Spaced            | 0.159         | 0.134        | 1.185         | .24        |
| Intensity x Lag 3             | 0.014         | 0.111        | 0.130         | .90        |
| Duration x Spaced             | -0.003        | 0.002        | -1.550        | .12        |
| Duration x Lag 3              | 0.001         | 0.001        | 1.116         | .26        |
| RANDOM EFFECTS                | $\sigma^2$    |              |               |            |
| Item                          | 0.881         |              |               |            |
| Subject                       | 0.156         |              |               |            |

## MEMORY AS A FUNCTION OF PROSODY



Greater **intensity** at 2nd mention reliably predicts speaker's memory.



No systematic relationship between **duration** and speaker's memory.

## EXAMPLE OF MATCHER'S MAP

See front side for other task details.



## REFERENCES & ACKNOWLEDGMENTS

- <sup>1</sup> Fowler, C. A., & Housum, J. (1987). *Journal of Memory and Language*, 26, 489-504.
  - <sup>2</sup> Aylett, M., & Turk, A. (2004). *Language and Speech*, 47, 31-56.
  - <sup>3</sup> Watson, D. G. (in press). In B. Ross (Ed.) *The Psychology of Learning and Motivation*, Vol. 52. Elsevier
  - <sup>4</sup> Lam, T. Q., & Watson, D. G. (submitted)
  - <sup>5</sup> Cepeda, N. J., Pashler, H., Vul, E. Wixted, J. T., & Rohrer, D. (2006). *Psychological Bulletin*, 132, 354-380
  - <sup>6</sup> Szekely, A., et al. (2004). *Journal of Memory and Language*, 51, 247-250
  - <sup>7</sup> Snodgrass, J. G., & Vanderwart, M. (1980). *Journal of Experimental Psychology*, 6, 174-215
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