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# How do articulatory rehearsal and attentional refreshing interact with phonological similarity in the complex span paradigm?

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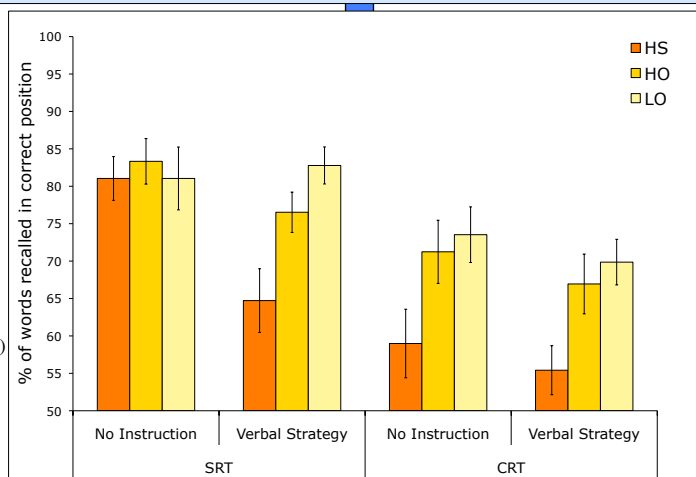
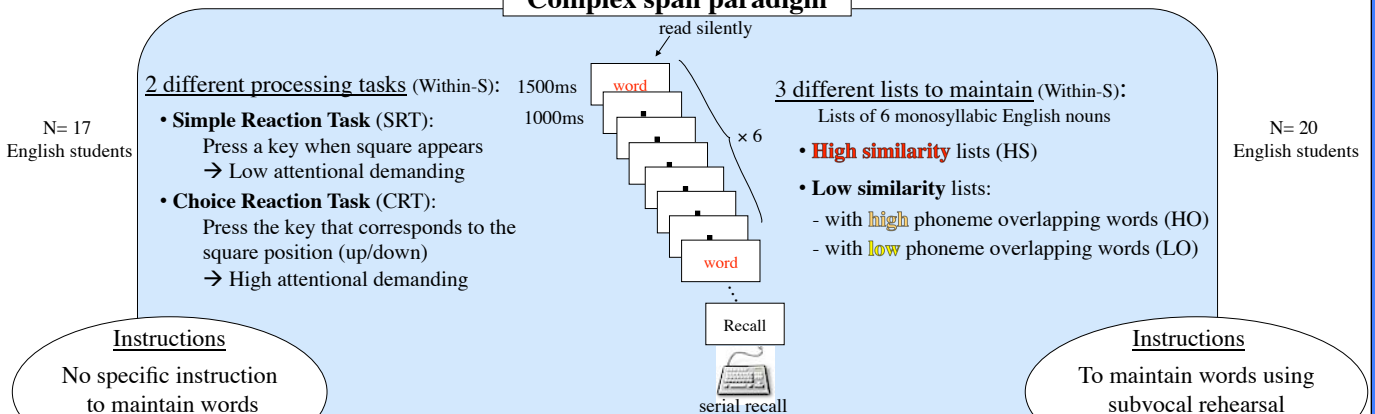
## Different accounts of decay and maintenance of verbal information in working memory

|                         | <b>Phonological Loop</b><br>(Baddeley, 1986)   | <b>Time-Based Resource-Sharing model</b><br>(Barrouillet et al, 2004)                                | <b>Interference model</b><br>(Oberauer & Kliegl, 2006)                |
|-------------------------|--|--|---|
|                         | <ul style="list-style-type: none"> <li>time related decay</li> <li>articulatory rehearsal</li> </ul>   | <ul style="list-style-type: none"> <li>time related decay</li> <li>attentional refreshing</li> </ul> | <ul style="list-style-type: none"> <li>feature overwriting</li> </ul> |
|                         | How to account for phonological similarity effect: Articulatory Rehearsal or Feature Overwriting?<br>How to account for maintenance: Articulatory Rehearsal or Attentional Refreshing? |  |   |
|                         | Aim of the study is to explore the impact of attention demand on phonological similarity effect  |  |   |
| Phonological similarity | Effect   | ???  | Effect  |
| Feature overlap         | No effect  | ???  | Effect  |
| Attention load          | No effect  | Effect   | No effect   |

### Exp 1

### Exp 2

## Complex span paradigm



### Results:

**Task effect** ( $p < .001$ ):  
 SRT > CRT

**Similarity effect** ( $p < .05$ ):  
 HS < HO = LO

**Interaction Task x Similarity** ( $p = .05$ )  
 In SRT → No similarity effect  
 In CRT → Similarity effect ( $p < .01$ )

- Marginal effect of Instruction ( $p < .07$ )  
 - Interaction Instruction x Similarity ( $p < .01$ )

### Results:

**Task effect** ( $p < .001$ ):  
 SRT > CRT

**Similarity effect** ( $p < .001$ ):  
 HS < HO < LO  
 HO < LO only for SRT

**No interaction Task x Similarity**  
 ( $p = .73$ )

- No effect of Instruction ( $p < .38$ )  
 - No interaction Instruction x Similarity ( $p = .99$ )

## Conclusion

- Effect of similarity as predicted by phonological loop model and interference model
- Effect of feature overlapping only with rehearsal instruction and low attentional demanding processing task → feature overwriting involves when both articulatory rehearsal and attentional refreshing are used simultaneously?
- Effect of attentional load as predicted by TBRS

### Strategy used for maintenance

|                                | No articulatory constraint | Articulatory constraint                            |
|--------------------------------|----------------------------|--|
| SRT<br>low attentional demand  | Attentional Refreshing     | Articulatory Rehearsal (+ attentional refreshing?) |
| CRT<br>high attentional demand | Articulatory Rehearsal     | Articulatory Rehearsal                             |