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# The Phonological Similarity Effect and the Word Length Effect: Hints for Maintenance Mechanisms in Working Memory



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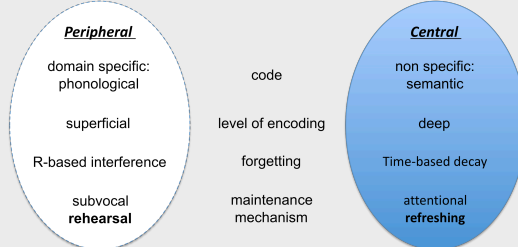
## Phonological loop model

Baddeley, 1986

- verbal information are stored as phonological codes
- verbal information are maintained by subvocal rehearsal
- articulating irrelevant material impedes rehearsal
- recall of phonologically similar words suffers from acoustic confusion = PSE
- recall of long words suffers from longer articulatory duration = WLE

## Extended Time-Based Resource-Sharing model

Camos, Lagner, & Barrouillet, 2009



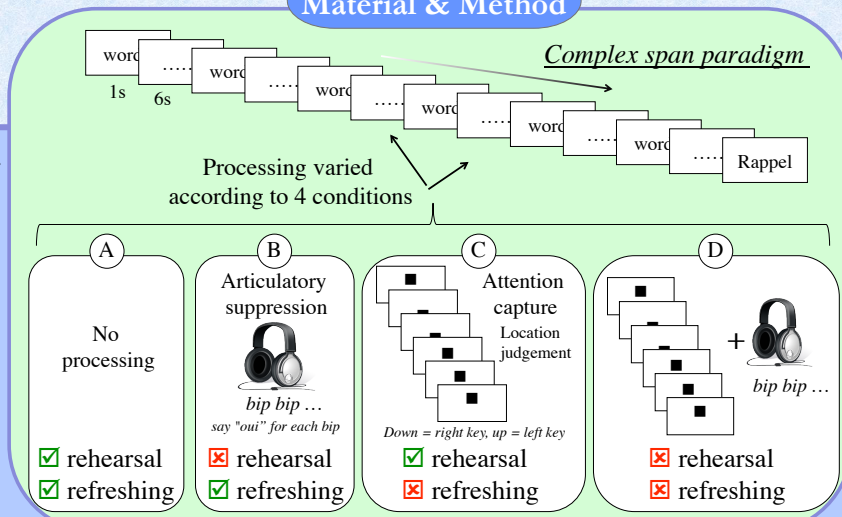
Are words maintained differently at peripheral and central levels?

## Time-Based Resources-Sharing model (TBRS)

Barrouillet et al, 2007

- maintenance and processing require attention
- attention rapidly switches over maintenance and processing
- traces decay with time as soon as attention is switched away
- traces are refreshed by attentional focusing

## Material & Method



### Exp.1 PSE

32 lists of 6 monosyllabic words to remember

#### Similar

Same central phoneme

- col
- note
- roche
- gomme
- toque
- bosse

#### Dissimilar

No common phoneme

- nage
- bosse
- mec
- chute
- ronde
- couche

### Exp.2 WLE

32 lists of 6 words to remember

#### Short

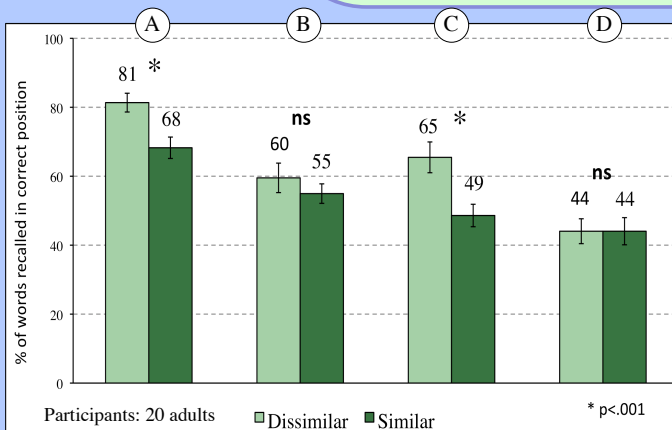
- > 1 syllable
- > 3 phonemes
- > 4 letters

- peur
- tour
- face
- piéd
- sens
- lieu

#### Long

- > 2 syllables
- > 5 phonemes
- > 6 letters

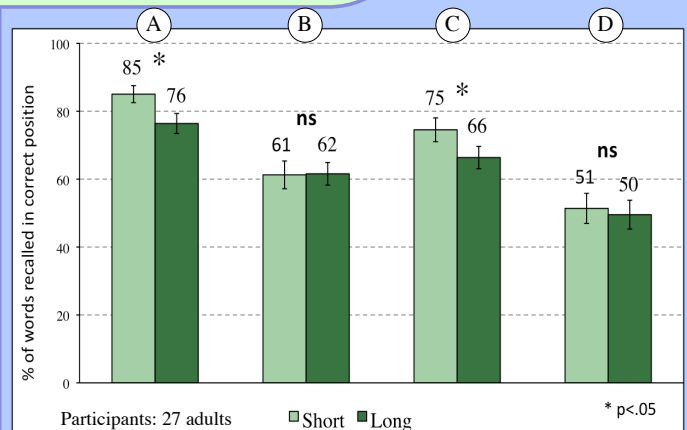
- regard
- soleil
- milieu
- garçon
- esprit
- jardin



effect of similarity,  $F(1,20) = 15.96$ ;  $p < .001$ , attention,  $F(1,20) = 71.05$ ;  $p < .001$ , and articulatory suppression,  $F(1,20) = 90.11$ ;  $p < .001$

no interaction similarity x attention,  $F < 1$

interaction similarity x articulatory suppression,  $F(1,20) = 12.71$ ;  $p < .001$



effect of length,  $F(1,26) = 11.71$ ;  $p < .01$ , attention,  $F(1,26) = 36.34$ ;  $p < .001$ , and articulatory suppression,  $F(1,26) = 63.62$ ;  $p < .001$

no interaction length x attention,  $F < 1$

interaction similarity x articulatory suppression,  $F(1,26) = 6.85$ ;  $p < .05$

## Conclusion

- > Rehearsal and refreshing could work separately or jointly, and their effects on recall are additive.
- > Words are stored as phonological codes when rehearsal is available and as non-phonological codes when rehearsal is impeded.
- Argue for the independence of peripheral and central levels assumed by the Extended TBRS model