

Investigating lexical retrieval in aging by means of a tip-of-the-tongue (TOT) study [Juncos-Rabadan et al., 2010]

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January 8, 2015



Brown, R., & McNeill, D. (1966)

The "tip of the tongue" phenomenon

Journal of Verbal Learning and Verbal Behaviour 5, 325 – 337.



Burke, D. M., MacKay, D. G., Worthley, J. S., & Wade, E. (1991)

On the tip of the tongue: What causes word finding failures in young and older adults?

Journal of Memory and Language 30, 542 – 579.



Juncos-Rabadan, O., Facal, D., Rodriguez, M. S., & Pereiro, A. X. (2010)

Lexical knowledge and lexical retrieval in ageing: Insights from a tip-of-the-tongue (TOT) study

Language and Cognitive Processes 25(10), 1301 – 1334.

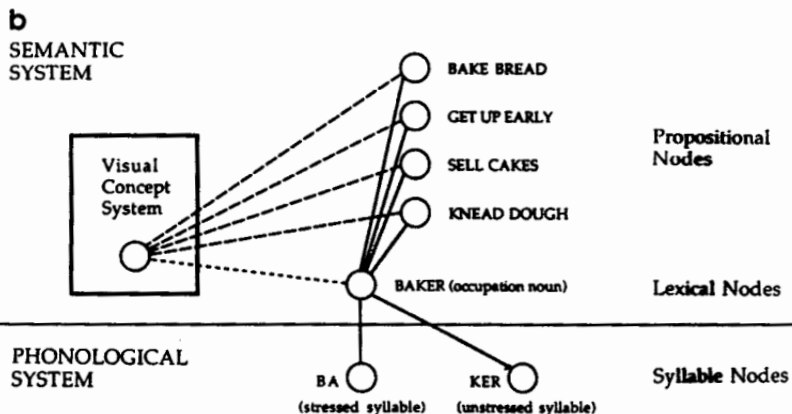
Q: *What are TOTs and how can they be explained mentally?*

Definition of TOT [Brown & McNeill, 1966]

Failure to recall a word of which one has knowledge when one wishes to accompanied by the sensation that recall is imminent

- "Do you know this famous poet, author, and philosopher of early German Romanticism?"
- "I know who you mean, the one who used a pseudonym, right?"
- "He starts with /n/"
- "/na:/, /no:/, ..."
- "/no'va:lɪs/!"

Cognitive Model for Common Nouns [Burke et al., 1991]



	semantic access	phonological access
pTOT	+	-
negTOT	-	-
GOT	+	+
notGOT	-	+

Table: TOT definitions [Juncos-Rabadan et al., 2010]

- DK ("don't know"): word that is not known
- N: total amount of words that were asked

Theorem (Success in semantic access)

$$(GOTs + pTOTs + negTOTs)/N$$

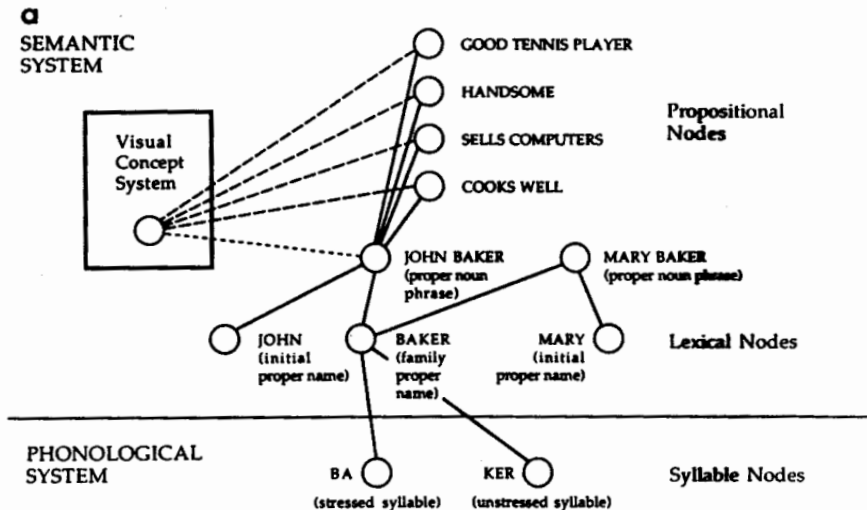
Theorem (Proportion of TOTs in successful semantic retrieval / failures in phonological access)

$$pTOTs/(pTOTs + GOTs)$$

Transmission Deficit Hypothesis (TDH) [Burke et al., 1991]

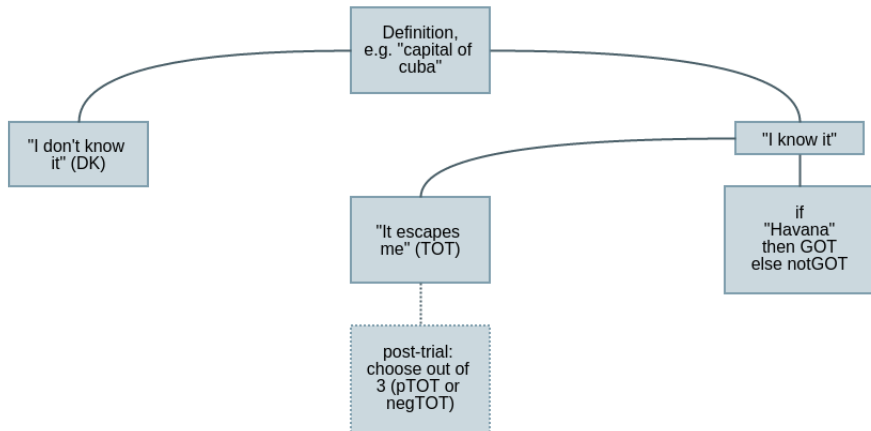
- Three layers of nodes: *semantics* → *phonology* → *phonetics*
- Activation of nodes by priming through connected nodes
- TOT as a result of faulty priming transmission from semantic to phonological node (competitors?)
- transmission lines degrade with age; degradation prevented by frequent and recent use
- Proper nouns more vulnerable to transmission deficits than common nouns (additional connections)

Cognitive Model for Proper Nouns [Burke et al., 1991]



Q: *Does ageing really have a negative influence on lexical retrieval?*

Procedure



Participants

- 140 in 4 age groups (**19-26; 50-59; 60-69; 70-82**)
- vocabulary: significantly lower for the youngest group (Spanish WAIS: $F(3, 136) = 2.94, p < .05$; Peabody: $F(3, 136) = 4.89, p < .001$)

Materials

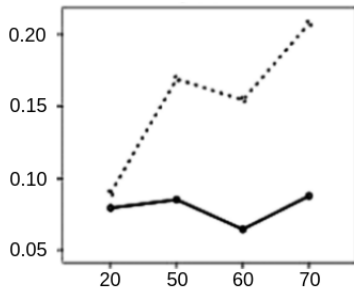
- 100 low-freq words (Pre-test: 150; exclusion of total GOTs and DKs)
- Definitions taken from the Diccionario de la lengua Espanola (1991)

- youngest group (compared to oldest)
 - more DKs ($F(3, 136) = 23.56, p < .001$)
 - fewer GOTs ($F(3, 136) = 18.56, p < .001$)
 - less success in semantic access ($F(3, 136) = 24.57, p < .001$)
- **Interpretation**
 - larger vocabulary and stronger semantic connections with higher age
 - relationship between vocabulary and the strength of semantic connections?
 - multiple regression with both variables
 - *why is there no significant difference in pTOTs?* (TDH)
 - separate analysis of common and proper nouns

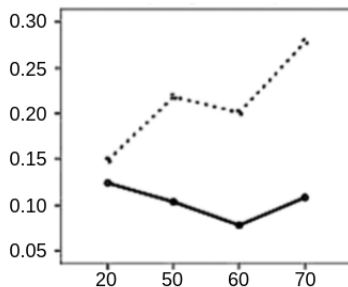
Results - Common and Proper Nouns

proper
common —

Age Groups: x
Marginal Means: y



pTOTs



$\frac{\text{pTOTs}}{\text{pTOTs} + \text{GOTs}}$
failures in phonological access

common nouns

- no significant difference among age groups for
 - pTOTs
 - failures in phonological access ($pTOTs / (pTOTs + GOTs)$)
- **Interpretation:** if transmission deficits exist (TDH): compensation by increased amount of semantic connections (larger vocabulary?) enabling alternative routes

proper nouns

- significant difference among age groups for
 - pTOTs ($p < .001$)
 - failures in phonological access ($p < .05$)
- **Interpretation:**
 - (1) phonological access to proper nouns decreases with age
 - (2) proper nouns are more vulnerable to transmission deficits which cannot be compensated (as seen for common nouns)

Multiple regression analysis on all stimuli with age and vocabulary as predictors

- success in semantic access best predicted by increasing age and Peabody scores
common nouns: ($R^2 = .37, F(1, 138) = 41.32, p < .001$)
proper nouns: ($R^2 = .17, F(1, 138) = 13.77, p < .001$)
- **Interpretation:** There is a relationship between vocabulary size and the strength of semantic connections

1 - Vocabulary

Increasing vocabulary with age strengthens semantic connections

2 - TDH

Deficits are compensated

- common noun retrieval profits
- proper noun retrieval still limited due to complexity

- A first comprehension question: Do competitor activations of TOT phenomenons favor serial or cascaded lexical retrieval?

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- Why do older people actually have a worse performance in picture naming if they can compensate their deficits?
- Can we even compare the experiments in the TOT study to picture naming?