Automatic Semantic Priming in Alzheimer's Disease: A Systematic Review

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Introduction

- Healthy individuals respond more quickly to semantically related words than to unrelated words during a lexical decision task called *semantic priming*
  - CAT – DOG (Related Words)
  - CAT – PEN (Unrelated Words)
- Some individuals with Alzheimer's disease (AD) exhibit abnormally increased priming effects, known as *hyperpriming* (Giffard, Laisney, Desgranges, & Eustache, 2015), but other studies have not shown this (Predovan et al., 2014)
- The last systematic review about this conflicting evidence was over 15 years ago (Ober, 2002)

Methods

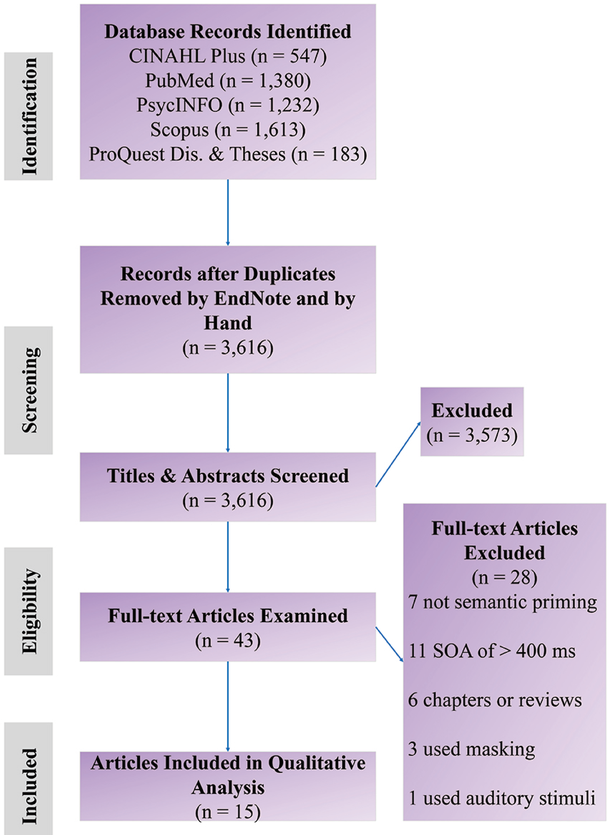
- We searched 5 databases:
  - CINAHL Plus
  - PubMed
  - PsycINFO
  - Scopus
  - ProQuest Dissertations & Theses

- Database searches were completed on January 27, 2018 and searched for new publications on June 18, 2018
- Two reviewers independently examined titles, abstracts, and full-text for all databases

Methods (cont.)

Inclusion Criteria	Exclusion Criteria
Individuals with Alzheimer's disease	Stimuli that were auditory instead of written
Semantic priming with prime – target only	Summaries or book chapters without new findings
Stimulus onset asynchrony (SOA) of < 400 ms	Articles not written in English

Systematic Record of Article Selection



Taken from Moher et al., 2009

Results

The objective of this systematic review was to determine the frequency of occurrence of hyperpriming during automatic semantic priming tasks in individuals with AD

Hyperpriming Findings in Analyzed Articles

1st Author	Year	AD[a] *n*	SOA[b]	Response	Hyper-priming?
(1) Bell	2001	10	250	Spoken	No*
(2) Bushell	1997	16	250	Spoken	No
(3) Giffard	2015	15	250	Button Push	Yes
(4) Giffard	2009	26	250	Button Push	Yes
(5) Giffard	2008	17	250	Button Push	No
(6) Giffard	2002	24	250	Button Push	Yes
(7) Giffard	2001	53	250	Button Push	Yes
(8) Hernandez	2008	36	250	Button Push	No
(9) Laisney	2011	16	250	Button Push	No
(10) Ober	1991	17	250	Spoken & BP	No
(11) Perri	2011	20	350	Button Push	Yes
(12) Perri	2003	21	300	Button Push	Yes
(13) Predovan	2014	7	350	Button Push	No
(14) Shenaut	1996	32	250	Button Push	No
(15) Silveri	1996	15	250	Button Push	No

[a]Alzheimer's disease; [b]Stimulus Onset Asynchrony in ms
*Seen, but not statistically significant

Selected Semantic Relationship Examples

Semantic Relationship	Prime	Target
Category coordinate (high association)	Tiger	Lion
Category coordinate (low association)	Cow	Donkey
Attribute	Tiger	Stripe
Superordinate-subordinate	Travel	Drive

Conclusions

- Individuals with AD do not exhibit any semantic priming on motion verbs[2], unemotional abstract words[3], distinctive attributes[9], or famous people[13]
- Priming, but not hyperpriming, occurs for emotional abstract words[3], shared attributes[5-7], superordinate-subordinate[10], and varying typicality[10]
- Disease severity impacts hyperpriming in semantic relationships like category coordinates[1-12,14&15] causing it to be a transient occurrence[6]

Selected Literature Cited

- Giffard, B., Laisney, M., Desgranges, B., & Eustache, F. (2015). An exploration of the semantic network in Alzheimer's disease: Influence of emotion and concreteness of concepts. *Cortex: A Journal Devoted to the Study of the Nervous System & Behavior, 69*, 201-211.
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- Predovan, D., Gandini, D., Montembeault, M., Rouleau, I., Bherer, L., Joubert, S., & Brambati, S. M. (2014). Loss of person-specific knowledge in Alzheimer's disease: Evidence from priming. *Neurocase, 20* (3), 263-268.

Disclosures

Larissa M. Jordan: None to report
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