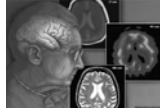
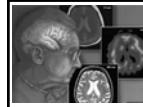


Concept Combination in Alzheimer Disease Using Constrained Sentence Production Tasks



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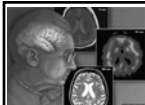


Introduction

- Individuals with Alzheimer disease (AD) present with deteriorating semantic representations that affect both nouns and verbs

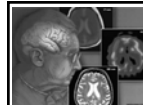
Yet...

- Their speech production is typically described as fluent and grammatical



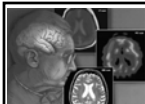
However...

- Participants with AD were significantly impaired in constrained sentence production task (Altmann, 2004)
 - Presented 2 nouns and a verb for participants to include in a sentence
- Findings
 - Overall fewer acceptable sentences
 - Severely impaired fluency
 - Many grammatical errors
 - Difficulties producing sentences with a prominent inanimate noun (at top of stimulus)



Current Study

- We extended the work of Altmann (2004)
 - Similar methodology
 - 2 nouns and a verb → produce grammatical sentence
- We hypothesized that stimuli with greater number of semantically related words would be easier to combine into sentences due to overlaps in semantic representations
- This effect should be exaggerated in Alzheimer disease because of semantic impairment



Current Study

We varied word relatedness:

- 3 Related Words

MECHANIC + REPAIRED + ENGINE

- 2 Related Words

MECHANIC + MOVED + ENGINE

- 0 Words Related

MECHANIC + MOVED + RUG

We varied word order:

- An-top (animate on top)

MECHANIC
REPAIRED
ENGINE

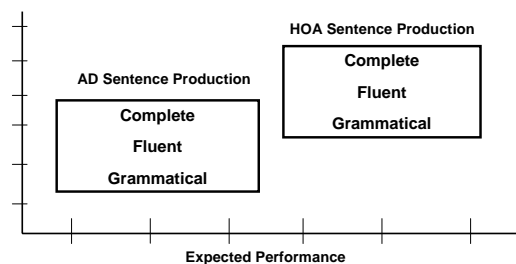
- In-top (Inanimate on top)

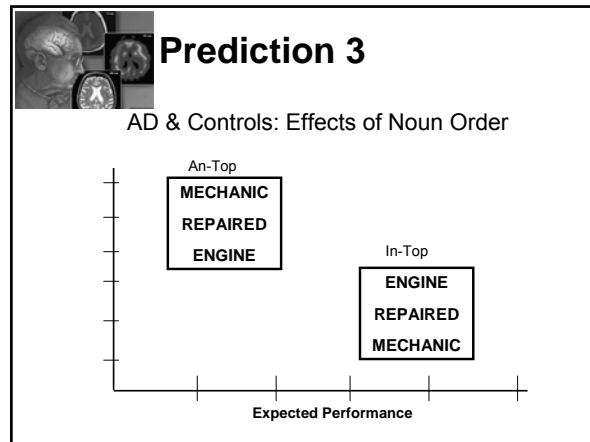
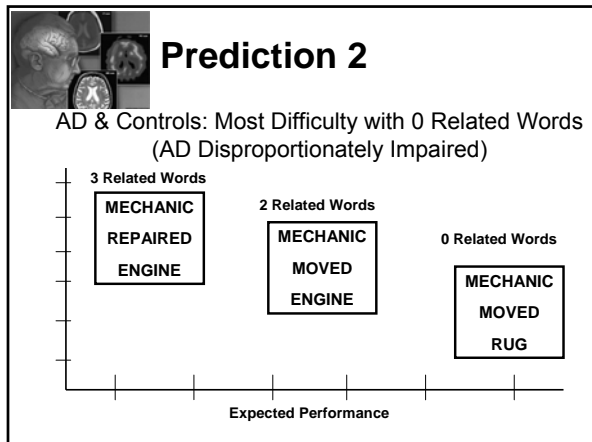
ENGINE
REPAIRED
MECHANIC



Prediction 1

AD: More Impaired Overall than Controls





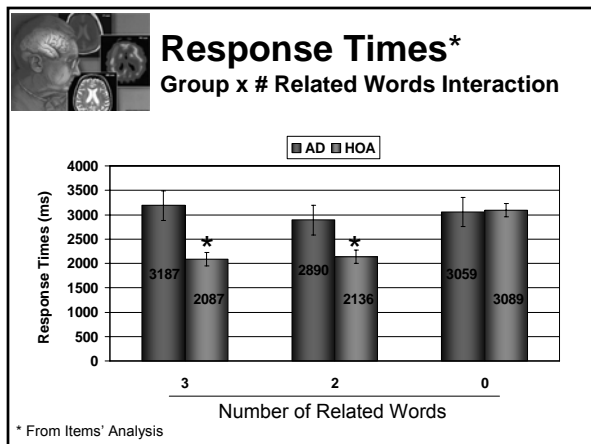
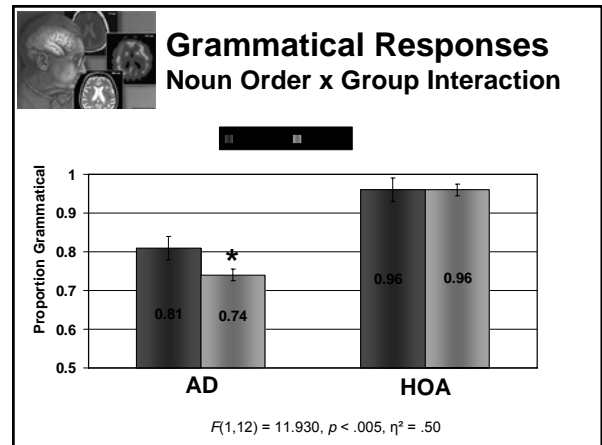
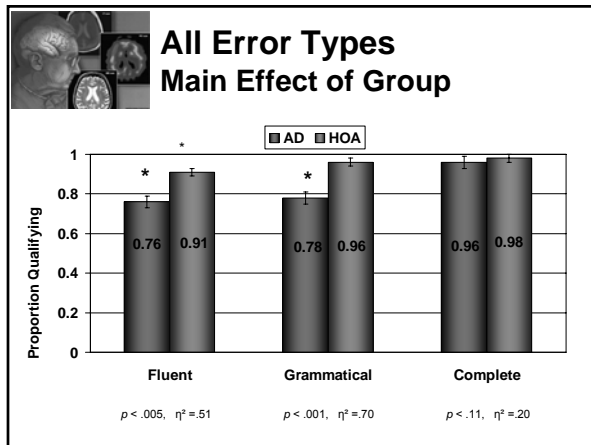
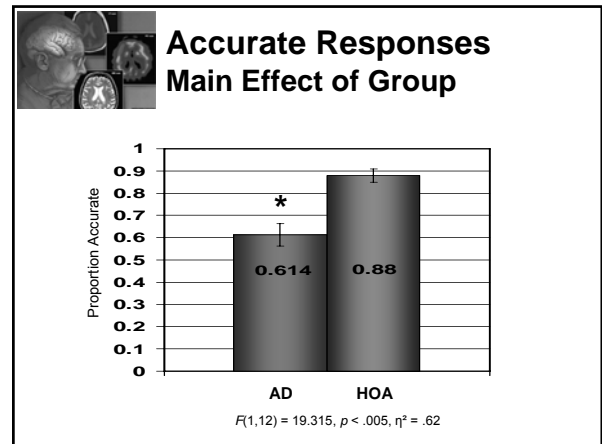
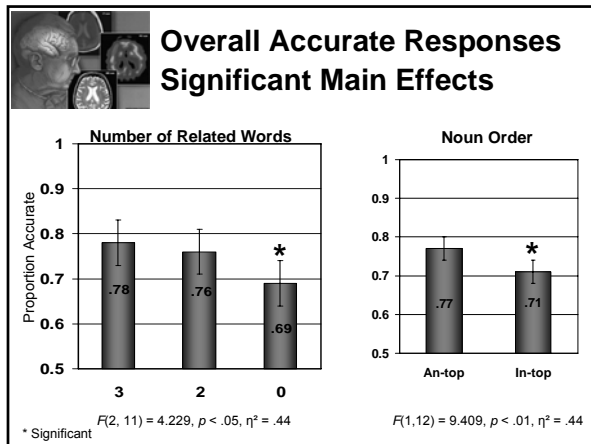
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- Methods Participants**
- 3 subjects with Alzheimer disease (AD)
 - NINCDS-ADRDA criteria (McKhann et al., 1984)
 - University of Florida Memory and Cognitive Disorders Clinic
 - MMSE: 21; 23; 27
 - 10 Healthy older adults (HOA)
 - Mean MMSE: 29.2 (1.32)

-
- Methods Demographics**
- Age did not vary between groups
 - AD: 76.7 y.o.
 - HOA: 78.1 y.o.
 - Education did not vary between groups
 - AD: 15.3 yrs.
 - HOA: 15.3 yrs.
 - Working memory varied marginally
 - DSB: AD = 4; HOA = 7.4
 - ($p > .07$; nonparametrically still marginal $p < .059$)
 - Category fluency varied significantly
 - AD: 33.7
 - HOA: 61.9 ($p < .01$)

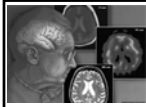
-
- Methods Procedure**
- Three two-hour home sessions
 - Battery included a range of tasks in addition to sentence production task
 - 5 Semantic tasks
 - 5 Working memory tasks
 - 2 Executive function tasks
 - 1 Sentence comprehension task

Results

Caveats
 Preliminary findings only
 Small samples - especially AD
 But consistent with previous findings

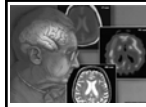


- ### Conclusion Prediction 1
- Individuals with AD showed significant difficulty with sentence production
 - Manifested in fewer: fluent responses, grammatical responses, complete responses (marginally)
 - Semantic impairment interferes with the ability to combine words into sentences
 - Grammatical requirements of words not activated
 - Most common error = missing "the"
 - Slowed activation of meanings from print impairs fluency



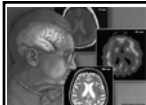
Conclusion Prediction 2

- The more related words in the stimulus, the easier sentence production should be
 - Significant effects of number Related Words in overall accurate and grammatical responses
 - But no interaction between group and number Related Words (both groups did more poorly with 0-Related)
 - No RT advantage for Related Word conditions for AD
- Degraded semantic representations interfere with the ability to take advantage of overlapping noun and verb representations to facilitate production



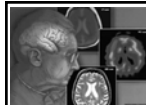
Conclusion Prediction 3

- Order of nouns affected grammaticality and overall accuracy of production
- Individuals with AD particularly impaired at producing grammatical sentences in Inanimate-top
 - 99.9% responses had animate subjects
- Limitations in semantic and working memory resources increase the difficulty of reordering stimulus words to put animate nouns first



Final Thoughts

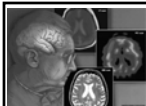
- The use of constrained sentence production tasks can reveal difficulties with language use not obvious from spontaneous speech



Special Thanks to...

- University of Florida Memory and Cognitive Disorders Clinic
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 - Danielle Sibilio
 - Danie Hiner

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Questions??



Thank you for your attention!