

Available online at www.sciencedirect.com**SciVerse ScienceDirect**

Procedia - Social and Behavioral Sciences 61 (2012) 293

Procedia
Social and Behavioral Sciences

Academy of Aphasia 2012

Lexicality Judgments in Acquired and Degenerative Neurological Conditions

Azevedo N.^{a,*}, Kehayia E.^a, Atchley R.^b, Nair V.^c^a McGill University^b University of Kansas^c Douglas Mental Health University Institute

Off-line psycholinguistic studies point towards a selective deficit in processing lexicality by individuals with Alzheimer's disease (AD), i.e. in their ability to distinguish whether a letter string is an actual word or not in their language, with the processing of pseudowords ("SUPIN") and nonwords ("PTILB") being more severely affected. In contrast, lexicality has not been found to be affected to the same extent in those with stroke and non-fluent aphasia.

We present three experiments that probe processing lexicality in individuals with probable AD and in those with aphasia, using on-line behavioural psycholinguistic methodology (experiments 1-2) and electrophysiological methods (experiment 3). **Experiment 1:** On-line visual simple lexical decision task. Participants were ten English-speaking individuals with probable AD (7F, 3M), age (74-91), MMSE (14-26/30), education (7-18 years); eight individuals with aphasia following a unilateral left hemisphere stroke (4F, 4M), age (34-87), education (12-19 years); and nine healthy controls (5F, 4M) with similar age and education. **Experiment 2:** On-line lexical decision task with constituent priming. Participants were eleven English-speaking individuals with probable AD (8F, 3M), age (64-86), MMSE (20-30/30), education (6-18 years); five individuals with aphasia following a unilateral left hemisphere stroke (3F, 2M), age (60-87), education (12-19 years); and nine healthy control participants (7F, 2M) with similar age and education. See Table 1 for details regarding methods for each experiment.

Results for experiments 1 and 2 show that individuals with AD had a different pattern of error rates than those with aphasia and the controls. Wilcoxon signed rank tests show that those with AD made significantly more errors to pseudowords than to real words (Experiment 1: $Z=2.09$, $p=0.037$; Experiment 2: $Z=2.934$, $p=0.003$) whereas the individuals with aphasia and the control participants performed at a comparable rate of accuracy across stimuli types (Experiment 1: $Z=1.41$, $p=0.161$ and $Z=1.614$, $p=0.106$; Experiment 2: $Z=4.05$, $p=0.69$ and $Z=1.60$, $p=0.11$). These studies suggest that processing lexicality may be particularly vulnerable to disruption by the AD disease process.

To further probe the specific nature of this deficit in AD, we turn to event-related potential (ERP) tasks that offer the possibility of obtaining additional information regarding the processes underlying lexical decision that are not visible with traditional psycholinguistic methodologies. **Experiment 3:** Four blocks of the oddball lexical decision task known to elicit the P3 component for the target event trials were used. We use P3 amplitude as a means of determining the degree to which individuals can make use of lexicality as a salient feature in a lexical decision oddball task. Participants are individuals with mild cognitive impairment (MCI), MoCA (21-25/30); with probable AD, MMSE (21-26/30); and healthy aging controls. Preliminary ERP findings suggest that there is a difference in P3 amplitude between the 3 groups corroborating the differential processing of lexicality that appears to be particularly susceptible to impairment in AD.

* Corresponding author. Tel.: 514-398-5867.
E-mail address: eva.kehayia@mcgill.ca.