

# Investigating the Efficiency of Reading Aloud Components of Single Words in Alzheimer's Disease

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## 1. Introduction

- There is a word recognition impairment in Alzheimer's disease (AD) for low frequency exception words (regularization errors) and pseudowords (lexicalization errors) (Graham & Patterson, 2004).
- However, there is no consensus today on which subprocesses of reading are impaired in AD and which ones could explain reading abilities in this population (Glosser et al., 2002).
- This may be caused by not considering all of the subprocesses of reading which are **(1) visual processing, (2) orthographic input lexicon, (3) lexico-semantic processing, (4) phonological output lexicon and (5) phonological buffer.**

## 2. Aims

1) Characterize the reading abilities in French, in individuals with mild and moderate AD and compare their performance between them and with healthy participants

2) Investigate the five subprocesses of reading in AD

## 3. Population

Groups will be matched on age, education\* and sex

	Control Group N= 30	Mild AD N = 30	Moderate AD N = 30
MMSE	> 28**	20-25**	16-19**

**Exclusion criteria** Illiteracy, first spoken language other than French, uncorrected hearing and/or vision problems, visual agnosia (BORB), anxiety (STAI), depression (GDS), history of learning disabilities, psychiatric or neurological disorder (stroke, traumatic brain injury, epilepsy) and alcoholism

**Inclusion criteria** AD patients diagnosed according to the research criteria of the NINCDS-ADRDA (McKhann et al., 2011)

MMSE = Mini-Mental State Evaluation ; BORB = Birmingham Object Recognition Battery; STAI = State-Trait Anxiety Inventory; GDS = Geriatric Depression Scale; NINCDS-ADRDA= National Institute of Neurological and Communicative Disorders and Stroke–Alzheimer's Disease and Related Disorders Association

\* According to Poitrenaud Scale

\*\*Cut-off scores according to GRECO

## 4. Methodology

### Reading Abilities

#### Word recognition task

second

#### Words

Regular (RW) low frequency  
 Regular high frequency  
 Irregular (IW) low frequency  
 Irregular high frequency

#### Pseudowords (PW)

- With orthographically similar neighbors (ex: cartine)
- Without neighbors (ex: esumuaru)

#### Pseudohomophones (PH)

- Visually similar to real words (ex: estoma)
- Visually distinct from real words (ex: aimausson)

### (1) Visual Processing

#### Pseudoword matching task

ardel  
 ardel      arbet

Stimuli: PW

Participants have to select the same pseudoword as the target at the top

### (2) Orthographic Input Lexicon

#### Lexical decision task

rekin

Stimuli:  
 RW, IW, PW and PH  
 Same stimuli as in the word recognition task

Participants have to decide whether the presented stimulus is a real word or not

### (3) Lexico-semantic Processing

#### Semantic word-matching task

main  
 sandale      gant

Stimuli: RW and IW  
 Same stimuli as in the word recognition task  
 Every word is accompanied with a vocal stimulus of the word

Participants have to select which word matches the target at the top

### (4) Phonological Output Lexicon

#### Semantic irregular word-matching task

fard  
 maquillage      classeur

Stimuli: IW

In this example, if participants make a regularization error: « fard » will be read as « farde »

Participants have to select which word matches the target at the top

### (5) Phonological Buffer

#### Repetition of pseudowords

« larrot »  
 lar      rot

Stimuli: syllables of PW  
 They are presented one by one on a computer screen.

Participants have to read each syllable and say outloud the final PW by repeating the syllables in the right order

RW and IW are matched for word frequency, length in number of letters, phonemes, syllables (Lexique 3.82 (New et al., 2004)), age of acquisition and imageability (these data will be collected from healthy older individuals). RW, IW, PW and PH are matched in length and orthographic neighbourhood size (Lexique 3.82)

Correct responses and reaction times will be collected and analyzed

### References:

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