The knowledge stored in semantic memory includes information about categories and features, as well as semantic relationships between concepts. In the semantic network, taxonomic (i.e., relations between objects of the same category) and thematic (i.e., contiguity relations based on co-occurrence in events or scenarios) links are both salient (Mirman et al., 2017). In Alzheimer’s disease (AD), there are contrasting results regarding the pattern of taxonomical and thematical deterioration in the semantic network (Simoes Loureiro & Lefebvre, 2016; Merck et al., 2019). Also, a remaining issue is to determine whether semantic processing of both kinds of links is embodied, as suggested by the upholders of the embodied cognition (e.g., Barsalou, 1999, 2008) and if the sensorimotor system takes differentially part in the semantic process in ageing and in AD. To describe the thematic vs taxonomic patterns and identify the involvement of sensorimotor processes and the network underlying them, electroencephalography (EEG) and semantic priming paradigm will be used.

INTRODUCTION

The knowledge stored in semantic memory includes information about categories and features, as well as semantic relationships between concepts. In the semantic network, taxonomic (i.e., relations between objects of the same category) and thematic (i.e., contiguity relations based on co-occurrence in events or scenarios) links are both salient (Mirman et al., 2017). In Alzheimer’s disease (AD), there are contrasting results regarding the pattern of taxonomical and thematical deterioration in the semantic network (Simoes Loureiro & Lefebvre, 2016; Merck et al., 2019). Also, a remaining issue is to determine whether semantic processing of both kinds of links is embodied, as suggested by the upholders of the embodied cognition (e.g., Barsalou, 1999, 2008) and if the sensorimotor system takes differentially part in the semantic process in ageing and in AD. To describe the thematic vs taxonomic patterns and identify the involvement of sensorimotor processes and the network underlying them, electroencephalography (EEG) and semantic priming paradigm will be used.

1. Priming effect

Taxonomic condition: A hyperpriming effect (abnormal increase in semantic priming) is expected in AD representing the degradation of distinct attributes of the concepts in the mild stage of AD (Laisney et al., 2004).

Thematic condition: A decrease in the priming effect (priming effect progressively disappears) is expected in the moderate stage of AD, as in Simoes & Lefebvre (2013).

2. Event-related potentials

Target words related to prime words should elicit a reduced N400 for unrelated target words, an increase in latency and decrease in amplitude of the N400 is expected demonstrating semantic deterioration.

MATERIAL

1. Semantic priming paradigm – semantic decision task

- N = 380 trials divided into 4 conditions:
  1) Taxonomic condition (N=38)
  2) Thematic condition (N=38)
  3) Neutral condition (N=180)
  4) Unrelated condition (N=38) and Fillers pairs (N=228)

- Task: pressing a button to answer the question “is it natural or manufactured” (counterbalanced left-right buttons)

- RT analyzes as Lecarder et al. (2007)

  Semantic association priming = RT unrelated – RT thema-taxo
  Facilitation effect = RT neutral – RT thema-taxo
  Inhibition effect = RT unrelated – RT neutral

- Task pre-tested with 15 subjects (5 from each group)
- Stimuli have been controlled and all the primes of different conditions were similar for this variables:

<table>
<thead>
<tr>
<th>Task 1</th>
<th>Task 2</th>
<th>Task 3</th>
<th>Task 4</th>
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<tbody>
<tr>
<td>AoA</td>
<td>AoA</td>
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<tr>
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2. EEG throughout the semantic decision task

- BrainVision Recorder
- 64 active electrodes + 4 exogenous electrodes
- 3 (electro-oculogram and 1 reference mastoid)
- Event-related potentials analyzes (N400)
- Frequency analysis of sensorimotor sensitive EEG rhythms:
  - Alpha
  - Beta
  - Mu

CONCLUSION

The objective was to present the study project, data will be collected later. Our research will contribute to a better understanding of taxonomical and thematical deterioration in the semantic network in AD and the contribution of sensorimotor processing in this deterioration.