Item familiarity and controlled associative retrieval in Alzheimer's disease: an fMRI study.

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INTRODUCTION

Typical Alzheimer's disease (AD) is characterized by an impaired form of associative memory, **recollection**, that includes the controlled retrieval of associations.

In contrast, familiarity-based memory for individual items may sometimes be preserved in the early stages of the disease.

Little is known about the brain correlates of **controlled retrieval of associations (CAR)** and **familiarity-based memory** in AD patients.

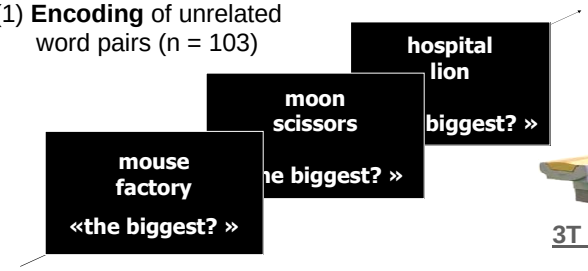
➔ This is the first study that directly examines whole brain regional activity during one core aspect of the recollection function: CAR contrasted to item familiarity in AD patients.

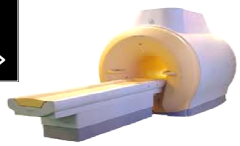
METHODS

Participants: 17 healthy older controls (HC)
26 patients with **Alzheimer's disease** (AD)

Task: associative memory task

(1) **Encoding** of unrelated word pairs (n = 103)

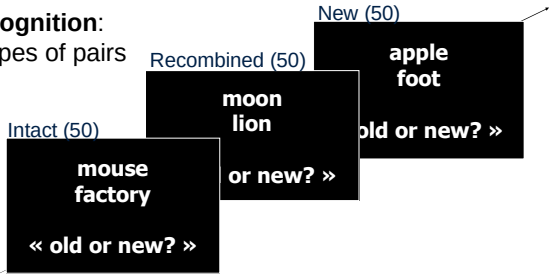




3T fMRI scanner

Process Dissociation Procedure:
inclusion condition: intact pairs
exclusion condition: recombined pairs

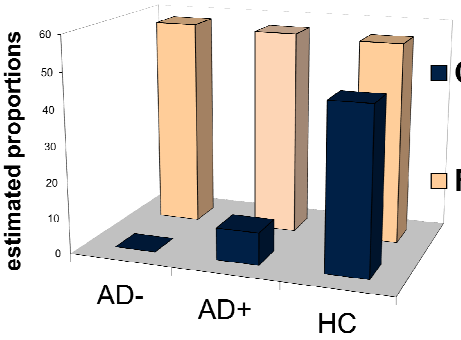
(2) **Recognition**:
3 types of pairs



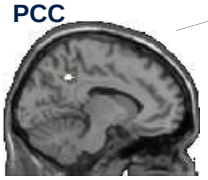
Data analyses: SPM8, p <.05 corr. for whole brain volume or VOI

RESULTS

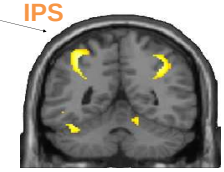
3 groups: CAR abilities ≤ 0: **AD-**, n = 10
CAR abilities > 0: **AD+**, n = 16
HC: n = 17



In HC and AD+:
PCC



In HC, AD+ and AD-:
IPS



Functional **interaction** with the **PCC** during CAR in **HC > AD:**

Inferior parietal

Hippocampus

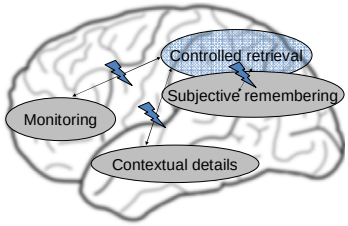
Dorsolateral prefrontal

DISCUSSION

In our AD patients, item familiarity is preserved whereas CAR is severely impaired.

Preserved automatic detection that an item is old (≈ familiarity) is supported by the IPS in AD patients as in HC participants.

Even if AD patients have objectively residual controlled associative retrieval process supported by relatively preserved PCC activation, this process might be qualitatively impaired due to deficient functional connectivity.



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