Altered Semantic Processing in Healthy Older Adults at Risk for Alzheimer’s Disease

**METHOD: Design and Procedure**

- We developed a novel reaction time (RT) paradigm to selectively direct the focus of attention between two simultaneously presented homograph associates on a DECISION task, followed by a rapid switch to READING a singly presented homograph aloud (Figure 1).

**RESULTS**

- **On DECISION RT**, the dose of ε4 alleles had a significant effect, F(2, 204) = 5.1, p < .01. ε4 homozygotes were on average 100 msec faster to respond than when there was no ε4.
- Homographs were the slowest to respond of all groups.
- There was no ε4 effect on READING RT.

**BACKGROUND**

- Homographs are words that are spelled exactly the same in English, but have at least two different meanings represented by homograph associates.

- Most homographs have one dominant meaning. For example, the dominant meaning for the homograph BILL is “money” and the non-dominant meaning is “name”.

- Loss of dominance of one meaning over another occurs in AD.

- The subtle semantic network required for this task improves with age, but might be sensitive to early decline in AD because it is less over-learned than the semantics of everyday language.

**CONCLUSIONS**

- Manipulating attentional focus changes implicit learning, providing empirical evidence that selectively directing attention can affect memory.
- The presence of the ε4 allele reduces the subtle semantic effect of homograph dominance on RT.
- The demand to rapidly switch between effortful decision and automatic lexical reading overrides semantic homograph dominance in ε4 homographs; the semantic network determining homograph dominance appears to be tenuous.
- The presence of the ε4 allele unexpectedly decreases recognition errors under some conditions.
- Subtle changes in attention directed memory performance may presage the episodic memory loss usually considered the cardinal sign of AD.

**REFERENCES**