

# Differential Recall of Nouns and Verbs in Patients with Probable Alzheimer's Disease (AD)

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## Introduction

- The negative impact of Alzheimer's disease (AD) on confrontational naming and immediate recall has been established, yet little research has explored whether AD-related language decline differentially affects immediate recall of nouns and verbs.
- Some previous reports have indicated that AD patients may have more difficulty naming nouns than verbs, so they may also have greater impairment in recalling nouns than verbs.
- In the present study, prospectively collected longitudinal data for 1,030 patients from the Baylor College of Medicine AD and Memory Disorders Center were analyzed.
- We hypothesized that:
  - 1) The total number of nouns and verbs immediately recalled will be higher in mild AD patients than in moderate AD patients.
  - 2) In both severity groups, noun recall will be worse than verb recall, and this pattern will be more pronounced in the moderately demented patients.
  - 3) Boston Naming Test (BNT) scores will be associated with immediate noun recall on the Logical Memory (LM) subtest of the Wechsler Memory Scale-Revised, but not with LM verb recall.

## Participants

- Participants in this study (N=1,030) were selected from a larger database of patients from the Baylor College of Medicine Alzheimer's Disease and Memory Disorders Center.
- Inclusion criteria included meeting NINCDS-ADRDA criteria for probable AD and a Mini Mental Status Examination (MMSE) score greater than 10 at their most recent annual evaluation.
- AD severity was determined by total MMSE scores. Patients with an MMSE scores greater than or equal to 20 were labeled "mild" and those with scores less than 20 were labeled as "moderate."

## Methods

- LM items were classified as either predominately nouns or verbs. Subjects' item-level responses were then summed to create scores for total nouns and total verbs recalled. Given the greater number of nouns than verbs in the LM stories, these total scores were transformed into proportions to be used in further analyses.

## Results

- As expected, t-tests revealed that patients with mild AD recalled significantly more LM items than patients with moderate AD (all  $p < .0001$ ). These results were significant for proportions of both nouns and verbs recalled.
- Paired t-tests showed that both groups of AD patients recalled a significantly higher proportion of verbs than nouns ( $p < .0001$ ).
- A mixed-model ANOVA yielded significant main effects (both  $p < .0001$ ) for both disease severity and word type (nouns or verbs), as well as an interaction effect of the two variables. ( $p < .05$ ). (See Figure 2)
- BNT scores were not significantly correlated with either LM noun or verb recall.

Figure 1. Percentage of Patients with Mild and Moderate AD Who Correctly Recalled Each LM I Story Unit

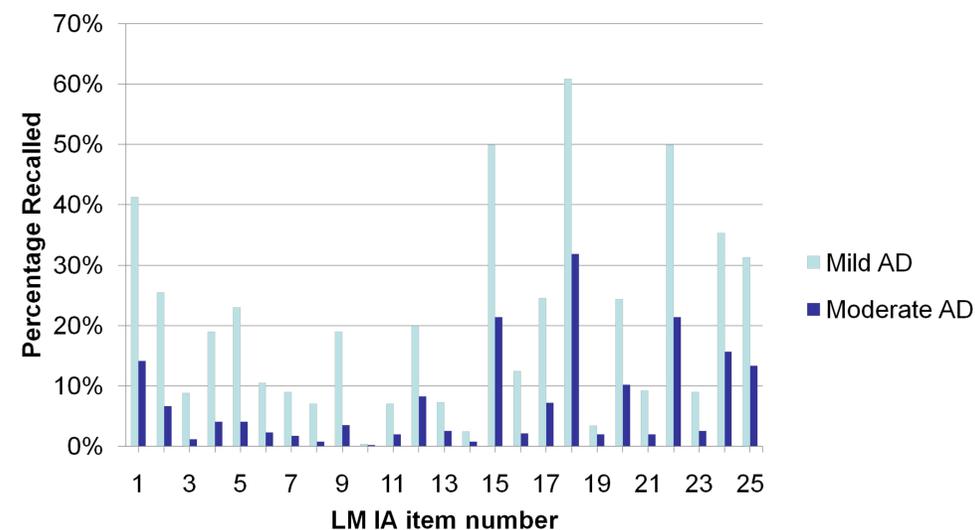
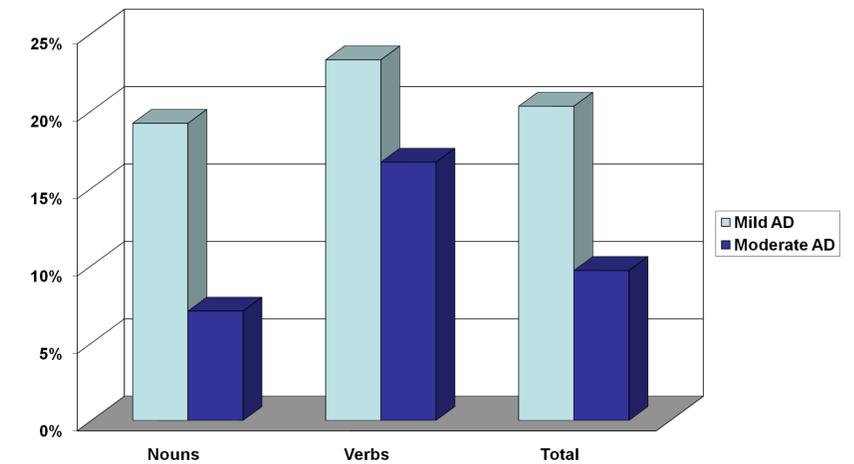


Figure 2. Proportion of Nouns, Verbs, and Total LM I Immediate Items Recalled in Patients with Mild and Moderate AD



## Conclusions

- As hypothesized, patients with mild AD recalled significantly higher proportions of nouns and verbs than patients with moderate AD.
- In both mild and moderate AD patients, verb recall was significantly better than noun recall (in proportional terms). The greater difficulty recalling nouns may reflect AD patients' substantial semantic impairment. The representations of verbs/actions may have greater motor and kinesthetic components, which may be better preserved in AD patients. An alternative explanation for this finding is that LM verbs contribute more to the overall gist of the story, while most of the LM nouns may be considered details. This explanation suggests that AD patients may be better able to recall the general theme of the story, rather than the details.
- As expected, this relative preservation of verb recall was impacted differentially by AD severity, and was more pronounced in patients with moderate AD.
- The fact that BNT scores and noun recall were not significantly associated was unexpected and suggests that memory impairment in AD is so severe (even in mildly demented patients) that recall of both nouns and verbs in stories is not influenced significantly by extent of semantic impairment.