

ABSTRACT

This study compared performance of two age groups of cognitively normal seniors and one group with mild Alzheimer's disease (AD) on neurolinguistic (Experimental Discourse Task) and neuropsychological (Logical Memory Test) measures of gist and detail processing at immediate and delay (30 minutes) conditions. Primarily, the study revealed that transformed discourse gist, which involves the synthesis of information, was preserved into old age but impaired in early AD. Therefore, transformed discourse gist may serve as an informative diagnostic measure for enhancing early detection of AD. Future aging studies are needed to determine how early transformed discourse gist deficits arise prior to the clinical manifestations of AD and to compare the disparity in gist versus detail processing in other neurological populations (e.g., traumatic brain injury,

BACKGROUND

Two Major Levels of Information Processing

(Brainerd & Reyna, 1990; Craik, 1994; Radvansky, Zacks, & Hasher, 1996; Reyna & Brainerd, 1992, 1995; van Dijk, 1995)

I. DISCOURSE DETAIL/MICRO LEVEL PROCESSING

1. Neurolinguistic: propositional idea units

(Experimental Discourse Task)

2. Neuropsychological: exact wording/lexical concepts

(Logical Memory Test)

II. DISCOURSE GIST/MACRO LEVEL PROCESSING

1. Transformed Interpretation

Ex: main idea, summary, lesson of newspaper article, narrative, etc; (Experimental Discourse Task)

2. Untransformed Main Points

Ex: recall of key concepts; (Logical Memory Test)

RATIONALE

1. Differences in Gist versus Detail Processing have been Relatively Unexplored

(Baltes, 1993; Chapman, 1997; Chapman, Ulatowska, King, Johnson, & McIntire, 1995; Labouvie-Vief, 1985; Ulatowska, Chapman, Highley, & Prince, 1998)

2. Differences in Gist versus Detail Processing may Distinguish Age versus Disease Effects

(Adams, 1990; Budson, Desikan, Daffner, & Schacter, 2000; Chapman, 1997)

PURPOSE

To Compare the Performances of Three Groups on Gist and Detail Processing

1. Two Measures

❖ **Neurolinguistic: Experimental Discourse Task**

(Chapman, 1997; Chapman, Ulatowska, King, Johnson, & McIntire, 1995)

❖ **Neuropsychological: Logical Memory Test**

(Wechsler, 1997)

2. Across Time

❖ Immediate Condition

❖ Delayed Condition (30 minutes)

METHODS: PARTICIPANTS

Three Groups

1. Cognitively Normal Young Seniors

(ages 65-79 years) (N=12)

2. Cognitively Normal Old Seniors

(ages 80-95 years) (N=12)

3. Individuals with Mild Alzheimer's Disease

(ages 65-79 years) (N=12)

METHODS:

GIST/DETAIL LEVEL MEASURES

1. Gist Experimental Discourse Task- transformed level of main idea (5 total)

“Give me the main idea of the story in just one sentence.”

2. Detail Experimental Discourse Task- proportion of propositions (14 total)

“I’m going to read a short story to you. I want you to try to remember as much of the story as you can because I am going to ask you to tell me the story in your own words in as much detail as possible.”

3. Gist Logical Memory Test- proportion of main points (7 total)

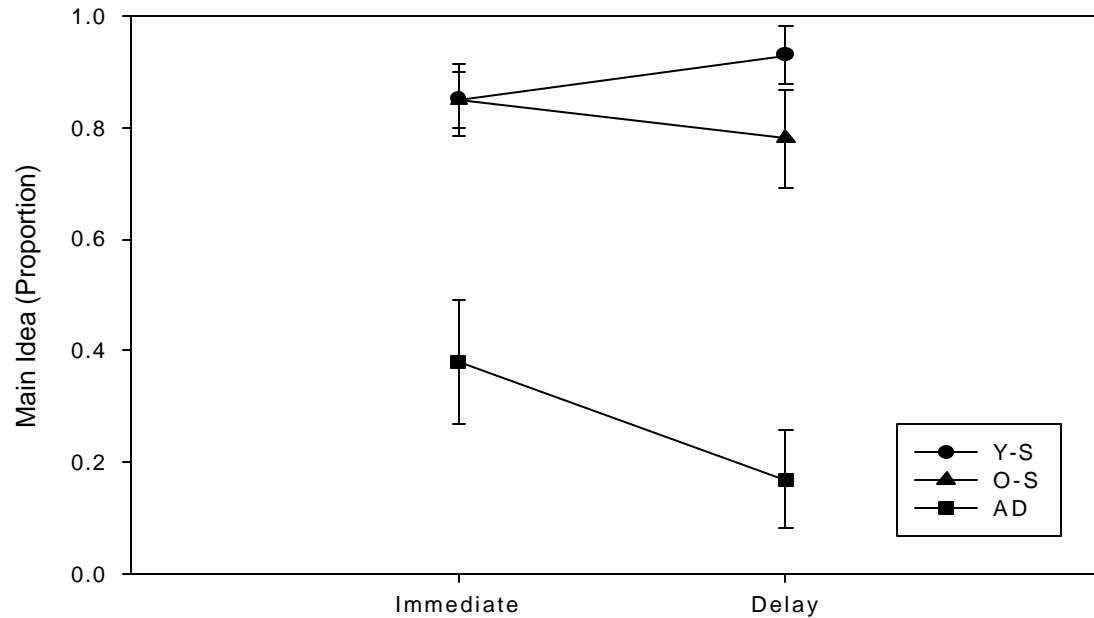
“I’m going to read a short story to you. Listen carefully and try to remember it just the way I say it, as close to the same words as you can remember. “

4. Detail Logical Memory Test- proportion of lexical concepts (25 total)

(Gist and Detail Logical Memory are scored from the same verbal production after the story)

GIST EXPERIMENTAL DISCOURSE

Figure 1. Discourse: Gist



Immediate Y-S = O-S > AD $p = .001$

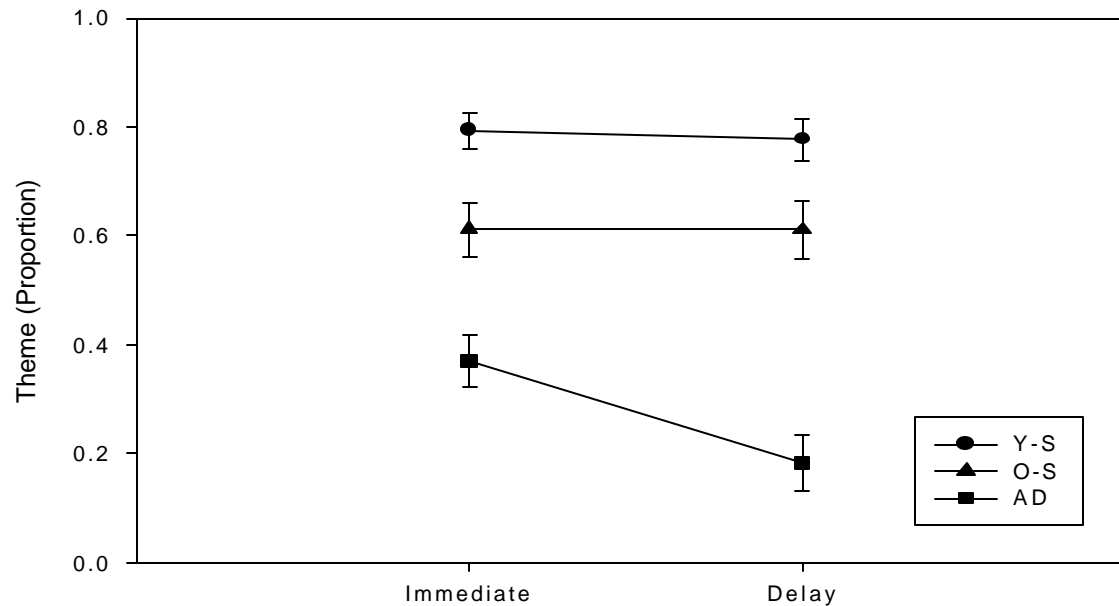
Delay Y-S = O-S > AD $p = .001$

No Group x Time interaction

GIST

LOGICAL MEMORY

Figure 5. Logical Memory: Gist



Immediate Y-S > O-S > AD p = .001

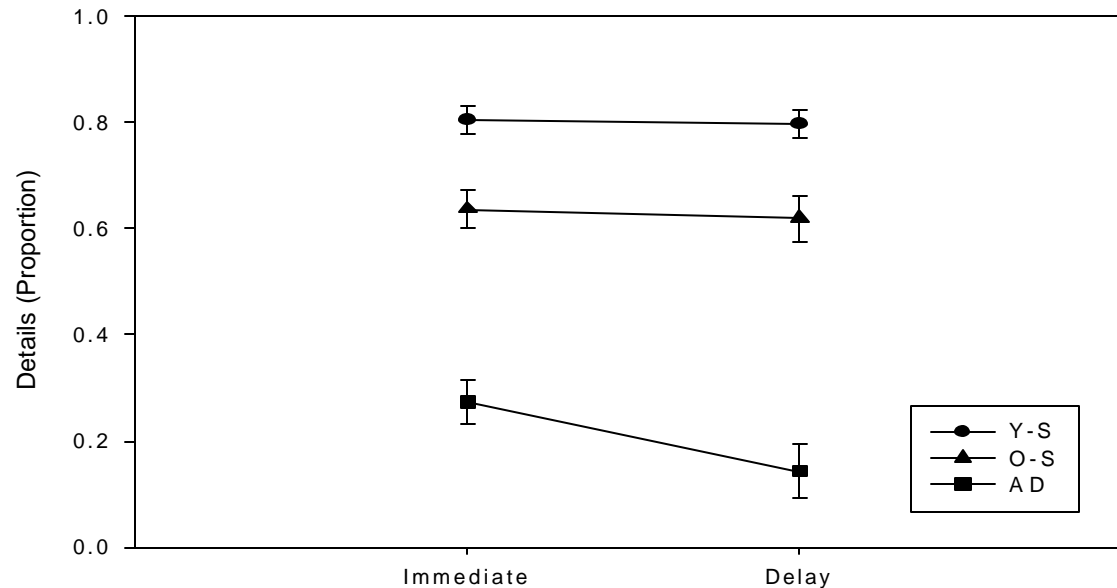
Delay Y-S > O-S > AD p = .001

No Group x Time interaction

DETAILS

EXPERIMENTAL DISCOURSE

Figure 2. Discourse: Details



Immediate Y-S > O-S > AD p = .001

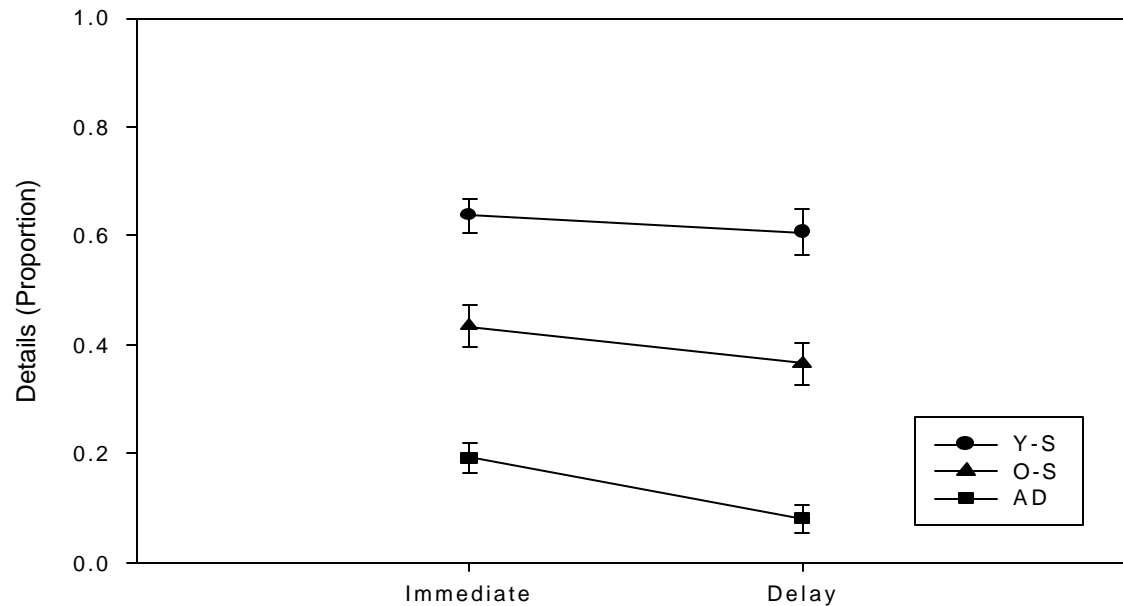
Delay Y-S > O-S > AD p = .001

Group x Time interaction

DETAILS

LOGICAL MEMORY

Figure 6. Logical Memory: Details



Immediate Y-S > O-S > AD p = .001

Delay Y-S > O-S > AD p = .001

No Group x Time interaction

SUMMARY

1. Discourse Gist in the form of an abstract interpretation is preserved into old age but impaired in early AD
2. Discourse Gist in the form of untransformed main points declines with aging and disease
3. Both Experimental Discourse and Logical Memory Details are reduced in Old Seniors compared to Young Seniors and are significantly reduced in AD, especially after a brief delay

DISCUSSION

CLINICAL

Why is Transformed Discourse Gist Preserved with Aging?

1. Efficiency Strategy

Deriving the Gist is more efficient than Detail processing with aging.

2. Compensatory Strategy

Detail processing is reduced with aging so older adults rely on the strategy of gist level processing.

Why is Transformed Discourse Gist Impaired with AD?

1. Some level of detail processing is necessary for deriving a transformed gist which is significantly impaired in AD.
2. Other cognitive-linguistic factors are involved in deriving a transformed gist which are also impaired in AD (e.g., inferencing ability, inhibitory control, working memory, ..)

Why is Transformed Gist preserved compared to Untransformed Gist with Aging?

1. Gist and detail processing may both be represented on a continuum. Untransformed Main Points may be more closely linked to Discourse Detail measures (e.g., propositional idea units) and therefore may demonstrate a similar pattern with aging.

THEORETICAL

Are Gist and Detail Processing Dissociable?

1. Gist processing does not always predict detail processing ability (e.g., advanced aging) and vice versa.
2. There may be differences in the neural networks supporting gist versus detail processing.

CLINICAL IMPLICATIONS

Transformed Discourse Gist May Provide

1. An informative diagnostic measure for enhancing early detection of AD
2. A therapeutic protocol to enhance cognitive functioning in at-risk seniors without dementia who are manifesting impaired transformed discourse gist

FUTURE DIRECTIONS

1. Longitudinal aging studies to determine how early transformed discourse gist deficits arise prior to the clinical manifestations of AD. Preliminary evidence suggests impaired transformed discourse gist in Mild Cognitive Impairment
2. Compare disparity in gist versus detail processing in other neurological populations (e.g., traumatic brain injury, frontotemporal dementia, etc)

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