

## Discourse Cohesion in Senile Dementia of the Alzheimer Type

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Attempts to describe speech and language in individuals with senile dementia of the Alzheimer's type (SDAT) have focused on linguistic abilities (Schwartz, Marin and Saffran, 1979; Bayles, 1982). Results suggest that, in SDAT, syntax and phonology remain basically unaffected but semantic abilities are impaired. The semantic impairment is reflected in the discourse of SDAT patients. Their communicative and pragmatic functions are maintained (Golper and Binder, 1981) but their speech is confusing and lacks coherence (Appell, Kertesz, and Fisman, 1982).

Cohesion is defined as structural or semantic relationships between elements of a text which contribute to the continuity of the discourse. We hypothesized that persons with SDAT would demonstrate greater discourse cohesion breakdown when compared to well-age cohorts. We further proposed that the breakdown in discourse coherence would follow the pattern of linguistic impairments reported for SDAT, that is, the structural relationships would remain relatively unaffected but semantic relationships would show marked discontinuity. The purpose of this investigation was to develop and apply a system for analysis of cohesion to study structural and semantic relationships as well as discontinuity in discourse of individuals with SDAT and the elderly.

Previous research and analyses have focused on elements of discourse that contribute to cohesion (Rochester and Martin, 1979). Methodology for cohesion coding used in these studies has been designed to examine the cohesiveness of individual texts, often written. These studies have not dealt with cohesion breakdown or conversational cohesion and the coding systems employed cannot easily account for these discourse phenomena. The development and application of cohesion analysis to coherent and incoherent conversational texts offers insight into the pattern of breakdown of coherent speech within the framework of social interaction.

### METHOD

Subjects. A.L. is a 75-year-old woman diagnosed as SDAT two years prior to this investigation. The diagnosis was based on neurological and behavioral findings. The patient's medical history is unremarkable and meets the research diagnostic criteria for SDAT proposed by Berg, Hughs, Coben, Danzinger, Martin and Knesevich, 1982. According to Obler's (1983) classification for language decline in Alzheimer's Disease, A.L. is in the early to middle stage of the progression. She demonstrated good comprehension but poor naming abilities on the Western Aphasia Battery. Test results revealed an Aphasia Quotient of 59. She resides in a group home for the elderly.

Eight well elderly, six females, and two males, 68 to 84 years of age ( $M = 73.4$  years) also acted as subjects. These participants had no history of speech, language or hearing problems. All were living independently at the time the study was conducted.

Procedures. The data were audiotaped speech samples of topic directed interviews and were collected during a single session conducted in the

subjects' homes. Three topics; family, daily activities, and health were introduced by the investigator through open-ended requests ("Tell me about your family.") and facilitated through appropriate prompts ("Umhum,").

The audiotapes were transcribed and the discourse coded for cohesion using the system devised by the investigators. Definitions and examples of the cohesion categories employed and the linguistic devices that comprise them are listed in Appendix A.

## RESULTS

The coded speech samples were analyzed according to the frequency with which the subjects used each cohesion category. Table 1 presents the results of the analysis applied to a 721-word sample from A.L. and from 50-word samples randomly selected from interviews of the eight well elderly. The 400-word sample from the elderly contained 127 instances of cohesion categories (.32 instances per word). A total of 250 instances of cohesion occurrences and disruptions were identified in the 721-word text of A.L. (.35 instances of cohesion per word).

Table 1. Frequency and percentage of occurrence of cohesion categories in interview discourse with eight elderly and one SDAT patient.

Cohesion category	Elderly		A.L.	
	<u>n</u>	%	<u>n</u>	%
Structural	17	13	41	16
Semantic	92	73	128	51
Referent	57	45	99	39
Conjunction	33	26	26	10
Ellipsis	2	2	3	2
Disrupted	18	14	81	33
No referent	4	3	54	22
Conjunction error	3	2	2	1
Ellipsis error			6	2
Missing element	11a	9a	19	8
Total	127	100	250	100

Note. Elderly data based on 400 word sample (50 words from each person).  
A.L. data based on 721 word sample.

a. Numbers represent combined occurrences for Ellipsis and Missing Element categories.

The elderly demonstrated 73% ties of the semantic cohesion type, with 14% disrupted cohesion and 13% structural in nature. For A.L., approximately one half (51%) of the instances were appropriate semantic relationships, one third (33%) were cohesion breakdowns, and the remaining cohesion devices (16%) were structural in nature.

Reliability for word agreement in transcription was 99%. Cohesion category agreement in coding was 83%. Both were checked by independent analysis of a 100-word segment by the three investigators.

## DISCUSSION

The results of the cohesion analysis supported the hypotheses. The SDAT person demonstrated greater cohesion breakdown than did the well elderly subjects. The pattern of breakdown reflected the linguistic abilities of Alzheimer's patients. A.L. appeared able to maintain discourse fairly well through structural cohesion and somewhat less effectively through semantic cohesion.

Use of structural elements and nonpropositional devices, to link discourse suggests knowledge of the form of discourse. Although A.L. used structural devices to provide form, she also used them inappropriately to link unrelated discourse. Inappropriate structural cohesion is illustrated in the following excerpt:

Interviewer: Could you tell me more about your family?

A.L. Well yes, it was rather short.

The subject linked her utterance to the interviewer's with a structural cohesion device but the semantic content of her statement was unrelated. Although well elderly subjects used a similar percentage of structural cohesion ties, they did not demonstrate inappropriate use of structural cohesion.

Examination of semantic cohesion in A.L.'s speech reveals an inconsistent pattern suggestive of a "shift" toward discontinuity rather than a loss of particular cohesive devices from her repertoire. All subjects produced referents and conjunctions. In addition, A.L. and two of the well elderly employed ellipsis. These productions suggest knowledge of the rules for proper usage of these devices. Reference was the most frequently occurring semantic link and absence of reference the most common disruption of coherence for A.L. Consistent with the existence of a semantic basis for disrupted cohesion, the elements A.L. most frequently omitted were nominals. It appears that use of referents in the text or context is critical to the coherence of speech.

A.L. rarely made errors in the use of conjunctions, possibly reflecting their structural function within discourse. Coordinating conjunctions appeared unaffected by the cohesion breakdown. It is interesting to note that Obler (1983) reports frequent use of logical conjunctions in the speech of Alzheimer's patients and the infrequent occurrence of these devices in patients with Wernicke's aphasia.

Ellipsis errors and missing elements were combined for analysis of the speech of the well elderly because there were few instances of missing elements. However, in A.L.'s discourse there were many more missing elements than shown by the well elderly and these were treated as a separate category. Missing elements occur at points where a semantic bridge is necessary to connect two unrelated parts of the text. Rochester and Martin (1979), in a study of thought disordered speech in schizophrenics, discuss semantic bridging and conclude that more research is needed to

determine what is required to form the sometimes subtle connections between portions of discourse.

To say that a speaker is incoherent is to say that we cannot understand. The listener is making a statement about his own confusion. It seems that we have acceptable limits of confusion. The well elderly demonstrated disrupted cohesion in all categories for a total of 14% disrupted cohesion. Although 14% disruption appears reasonable for an elderly speaker, 33% disruption, as demonstrated by the SDAT patient, is considered incoherent. There is no clear understanding of where the average listener's tolerance level lies. Additional research is needed to clarify this issue.

This investigation raises a number of issues for speech and language pathologists involved with diagnosis and clinical management of individuals with SDAT. First, further research appears warranted to ascertain patterns of changes in discourse cohesion during the progression of SDAT. Second, exploration into clinical management strategies for facilitating cohesion (particularly the increased use of referents) is indicated. Finally, examining coherence across a variety of tasks and contexts could provide information about a patient's maximum potential for coherence.

Insight into the pattern of cohesion breakdown in SDAT could provide information about the underlying cognitive requirements for discourse cohesion and may have theoretical implications for the relationship between cognitive and communication functioning.

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#### APPENDIX A

##### Definitions of Cohesion Categories

Cohesion Category	Definition
Structural cohesion	Nonpropositional elements which contribute to continuity of discourse but not to continuity of meaning in the text ("Well, well,").

Semantic cohesion	Elements which contribute continuity of meaning in the text.
Referent	Element whose meaning is present in the text or context ("I had twins. <u>They</u> were born so early,").
Conjunction	Linking element whose meaning is appropriate to the elements linked ("You couldn't go <u>unless</u> you could swim all the way,").
Ellipsis	Redundant element eliminated but referable from the text or context ("It was 18 days before we got there, and when we did [ <u>get there</u> ] we had to wait,").
Disrupted cohesion	Elements, present or absent, that disrupt continuity of meaning in the text.
No referent	Reference to element absent from the text and not referable from the context ("The only thing is <u>this</u> and <u>that</u> ,").
Conjunction error	Linking element whose meaning is inappropriate to the elements linked ("Swim all the way <u>so</u> we weren't much in it,").
Ellipsis error	Redundant element eliminated and not referable from the text ("I work very hard when I was [ellipsis] and than I had twins,").
Missing element	Absence of element that provides relationship between preceding text and that which follows ("I made my things for about two days...two no. [missing element] Whatever she I decided what it was,").

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#### DISCUSSION

Q: The background data you gave on this patient indicated that there was a significant naming problem. Since 54 of the 81 disruptions were cases of non-reference, to what extent can we attribute her difficulty to merely a naming problem?

A: In this particular patient the naming difficulty was probably a major contributing factor to the incoherence. However, Appell and associates report that only about 20% of Alzheimer's patients demonstrate anomia. I don't think that naming problems account for the general description of incoherence that is attached to the discourse of SDAT patients. Many of them do not show the degree of naming impairment that A.L. demonstrated.

Q: How do the naming deficits of these patients differ from the naming deficits of a patient that has Wernicke's aphasia?

A: I think in the case of A.L. her language breakdown has an aphasic component, anomia, that is reflected in her discourse.

Q: You feel she is demented and aphasic?

A: Yes I do. Appell reports on a study of 25 Alzheimer's patients in which, based on a standard battery, all were aphasic to some degree. Obler suggests that the Wernicke's and Alzheimer's patients only appear similar. She contends that the problem has very different origins. Alzheimer's is a memory, attentional, pacing problem that appears as a naming problem similar to anomia in Wernicke's aphasia.

Q: My own experience is that patients with Alzheimer's are quite different from patients we call aphasic. The Alzheimer's patient is in the wrong house and the aphasic patient is in the right house but the wrong room.

A: That seems more in keeping with Obler's view. However, I don't think there is clear agreement on this point.

Q: By calling a patient aphasic and demented you're muddying the water and disregarding real differences. It's important to look at those differences in diagnosis.

A: I don't think there is good understanding on this issue and I would agree with you that it is a messy area that needs further examination.

Q: What was duration of disease and was her classification moderately involved?

A: She was diagnosed two years prior to the taping. She has good comprehension which suggests early stage, and yet her naming problem and some other behaviors would fit more into the middle stage of Alzheimer's. I would place her at the border of the early and middle stage.

Q: We recently completed a study of cohesion and coherence in nine Alzheimer's patients and one of the things we found was a strong relationship between duration of disease and cohesion breakdown. Do you have any feel for where in the course of the disease cohesion breakdown would occur?

A: I would suspect it's fairly early. At the Center for Assessment of Aging at Case Western Reserve we find that one of the comments by family members at the initial interview is that they became concerned about the patient when he "didn't make any sense when I talked to him." We have no longitudinal data and by the time patients are referred to us they are often well into the disease.

Q: Did you base your analyses on words, utterances, or propositions?

A: We used words.

Q: Did you do anything with propositions?

A: No.