
Management of a Word-Finding Deficit in Discourse: A Case Example

Gestion du déficit de recherche de mots dans le discours : étude de cas

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Key words: discourse, Alzheimer's disease, speech-language pathology

Abstract

Our understanding of the language and communication disturbances of individuals with Alzheimer's disease (AD), coupled with our awareness of the increasing number of those affected, has led to our recognition of the need for speech-language pathology services for this population. Studies of discourse, both for normal-aging adults and for adults with AD, offer a promising framework for intervention. Such a framework can be further enhanced when developed in light of research findings concerning, for example, specific language abilities such as word-finding, other cognitive processes such as memory, and, in broader terms, the social consequences of communication impairment for individuals with AD and those around them. The purpose of this article is to review such research findings relevant to one aspect of impaired discourse, a word-finding deficit, in the context of intervention planning for one individual with AD.

Abrégé

Notre connaissance des troubles du langage et de la communication chez les personnes atteintes de la maladie d'Alzheimer, jumelée au fait que nous savons que le nombre de personnes touchées ne cesse d'augmenter, nous a incités à percevoir la nécessité de services d'orthophonie pour cette population. Les études du discours, tant chez les adultes vieillissant normalement que chez ceux atteints de la maladie d'Alzheimer, offrent un cadre d'intervention prometteur. Ce cadre peut être perfectionné s'il est élaboré à la lumière de résultats de recherche touchant, notamment, certaines aptitudes linguistiques spécifiques, par exemple la recherche de mots, d'autres processus cognitifs comme la mémoire et, de façon plus générale, les conséquences sociales du déficit de communication chez les personnes atteintes de la maladie d'Alzheimer et dans leur entourage. L'objet des présentes est d'analyser les travaux de ce type et d'exposer les constatations pertinentes à un aspect de la déficience dans le discours, à savoir le déficit de recherche de mots, dans le contexte de la planification de l'intervention chez une personne atteinte de la maladie d'Alzheimer.

KD, a 75-year-old woman, referred herself to a speech-language pathology clinic for help with word-finding difficulties. Her physician supported the referral and reported that the previous year she was diagnosed with probable Alzheimer's disease (AD). He added that she had returned to Vancouver from eastern Canada 12 years ago, shortly after retiring from an active career in her church and in a university department of theology. KD is single, with no immediate family. She has an extensive network of friends across Canada and the United States. Two years ago, she moved in with a late middle-aged couple (now her caregivers) whom she met four years earlier. They have been actively involved in her social network locally and are taking increasing responsibility in the management of her affairs.

KD's caregivers supported her request for language therapy. They expressed a goal of helping her to maintain as much control over her own affairs as possible, although they do have power of attorney for her. They encourage her to keep in contact with her many friends, but are hampered by being unfamiliar with people who live at a distance and with events from her past. They noted that this lack of familiarity also contributes to communication breakdowns, in that they often do not have shared background knowledge to help overcome word-finding problems.

Alzheimer's disease (AD) is known primarily as a disorder of the elderly involving a progressive decline in memory and other cognitive abilities. Disturbances in language and communication are among the most prominent and well-studied symptoms of this disease (Kempler, 1995). Numerous theoretical and clinical issues have arisen in the study of the communication disorders of this population. In recent years, there has been considerable interest in the discourse of individuals with AD, both in terms of assessment and intervention. Major questions include: What is the

nature of the linguistic and cognitive impairments which contribute to disruption of discourse abilities? Do the linguistic and memory deficits which are evident in discourse reflect a loss of semantic knowledge or, rather, a breakdown in the mechanisms that access that knowledge? Further, given the centrality of linguistic and cognitive impairments and the degenerative course of this illness, what are justifiable treatment goals in the management of discourse problems of adults with AD?

This article will address the foregoing questions within the context of an intervention plan targeting the discourse problems of the case example, KD. A key feature of KD's discourse, immediately apparent in conversation with her, is her word-finding difficulty. Our discussion is intended to illustrate the interaction between word-finding deficits and discourse, including ways in which word-finding impairments can be addressed from a discourse perspective. The discussion is not intended to be a report of overall case management, nor of treatment efficacy; at the time of writing, intervention for KD was just beginning. Rather, the discussion will review research findings regarding word-finding and discourse in the context of intervention planning. First, consideration will be given to theoretical issues relevant to KD's word-finding abilities. This review will focus on semantic and autobiographical memory deficits of patients with AD with specific reference to implications for word retrieval. Structural characteristics of discourse which may have implications for word-finding abilities then will be reviewed. Next, assessment findings and conclusions will be discussed in relation to the foregoing theoretical issues. Finally, the intervention plan designed for KD will be described with reference to literature on management of communication disorders of adults with AD.

Theoretical Issues

Semantic Abilities

The nature of the semantic impairments in AD has been widely discussed. Clinically, the disturbances are reflected in impaired naming ability, decreased verbal fluency, and word-finding difficulties in spontaneous conversation, object description, and word definition. Efforts to characterize further these semantic disturbances have employed numerous experimental paradigms and tasks. A central debate in the interpretation of findings concerns whether the performance of individuals with AD reflects a loss of semantic information (i.e., degraded storage), or whether it results from a processing deficit which impedes access to a relatively intact semantic system. This debate is relevant to intervention for KD's word-finding deficits, in that treatment strategies targeting degraded storage could differ from those

used to facilitate access to an intact system.

Before proceeding to a brief review of the literature highlighting this debate, a few cursory points are in order. Much of the research regarding semantic impairments in AD, conducted from within the perspective of cognitive psychology, has focused on the construct of *semantic memory*. As defined by Tulving (1972), semantic memory contains knowledge about "words and other verbal symbols, their meanings and referents, about relations among them, and about rules, formulas, and algorithms for the manipulation of the symbols, concepts and relations" (p. 386). In other words, semantic memory stores the conceptual representation (versus the lexical representation) of words.

Most investigations of the semantic deficits in adults with AD have focused on deficits in semantic memory. Many models of semantic memory are based on some formulation of semantic network theory (for review see Chang, 1986). According to this theory, concepts are represented by nodes which are interconnected by a variety of relationships, including category membership (e.g., *apple* and *orange*), and functional (e.g., *knife* and *cut*), or property relations (e.g., *knife* and *sharp*). When a concept node becomes activated, for example in response to its name, an automatic, diffuse spreading of excitation to other connected nodes occurs, increasing briefly the accessibility of these related concepts to further processing (Nebes, 1989). Many authors have interpreted their experimental results with reference to semantic network theories, whether in support of degraded storage or in support of impaired access to an intact semantic store.

Evidence which has led numerous investigators to conclude that the semantic impairment in AD reflects a loss of semantic knowledge relies primarily on findings which suggest consistency in performance deficits (see Nebes, 1989, and Chertkow & Bub, 1990). Such evidence includes: (a) an item-specific naming impairment which is consistent over time (Huff, Corkin, & Growden, 1986); (b) a decrease in the number of paradigmatic responses on word association tasks (Gewirth, Shindler, & Hier, 1984); (c) failure of semantic cues to facilitate naming; (d) consistency between the inability to name an item and the inability to answer questions about its attributes (Chertkow & Bub, 1990); (e) consistency between an inability to produce a name and later to recognize the same name (Flicker, Ferris, Crook, & Bartus, 1987); and (f) more generally, a correspondence between naming and word comprehension errors (Chertkow & Bub, 1990).

Evidence in support of the view that access to the semantic system is impaired in AD relies primarily on

inconsistency of performance on semantic tasks. It is assumed that inconsistency results from disrupted retrieval mechanisms, while underlying semantic information is intact. The evidence cited includes: (a) preserved ability to spontaneously gesture the function or shape/size of an object in spite of an inability to name it (Nebes, 1989; Bayles & Tomoeda, 1983); (b) the facilitation of naming by phonemic cues (Martin & Fedio, 1983; Neils, Brennan, Cole, Boller, & Gerdeman, 1988); (c) inconsistency of performance on specific items and naming errors which are frequently from the same semantic category (Kempler, 1988); (d) improved naming when an object is handled (Barker & Lawson, 1968); (e) the superiority of comprehension over production of the same words; and (f) more generally, the observation that individuals with AD do quite well on vocabulary tests through the early stage of AD, even when naming may already be markedly affected (Kempler, 1995). In addition, the finding that naming performance is worse for low frequency and abstract words has been used to argue in favor of impaired access (Nebes, 1989).

The impaired access hypothesis states that word-finding problems result from impairment in the processes or mechanisms that establish connections between conceptual and lexical representations of words. Nebes (1989) views the difficulty as an impairment of lexical search processes, emphasizing that individuals with AD are most impaired on tasks that require an active, directed word search, such as verbal fluency, object naming, or generation of associates. Although in an earlier study (Nebes, Martin, & Horn, 1984), the authors accounted for impaired performance in terms of automatic versus intentional processing, Nebes (1989) later concluded that the usefulness of this distinction has not yet been demonstrated. In keeping with arguments of Craik (1984), performance variability could reflect an impairment in self-initiation, such that performance is superior when appropriate processing is induced and directed by the experimental task itself. Although evidence can be cited in support of these views, none provides an entirely satisfactory account of the nature of the access impairment. Nebes (1989) points out examples in which apparently equivalent retrieval demands (e.g., automaticity, familiarity) result in differential performance.

Some of the above findings have been interpreted more broadly to account for the task-dependent variability in semantic performance in general (i.e., not just in support of the impaired access hypothesis), but at present no one explanation provides an adequate account. Perhaps, in part, this is because the methodologically relevant details which differentiate the tasks are not yet apparent. Furthermore, although it is possible to isolate the characteristics of a task, (e.g., requires lexical search), there may be many factors that can influence those characteristics. In this regard, the

relevance of experimental results to an understanding of word-finding in discourse is dependent on our ability to delineate these task differences.

To summarize, the debate concerning semantic impairment as degraded semantic knowledge versus impaired access to intact semantic knowledge is complicated both by conflicting evidence and by conflicting interpretations of the same evidence. It is further complicated by the possibility of differences between individuals with AD, so that each explanation could apply to different sub-groups. Finally, it is possible that both problems occur, either simultaneously or sequentially. Neils et al. (1988) examined responsiveness of phonemic cueing in the AD population. They found that phonemic cueing was most successful in participants with mild AD, a finding which suggests that in the course of the disease, deficits in retrieval of the lexical representation of words (similar to the word retrieval deficits of some aphasic patients) may precede deficits in semantic representation. What is not clear is the extent to which these deficits represent distinct processes, versus different points on a continuum. Without a clearer delineation of the cognitive mechanisms involved in word knowledge and word retrieval, it is unlikely that this question can be resolved. Nevertheless, consideration of the evidence supporting different accounts of word-finding deficits can help the clinician to develop a working hypothesis for a particular client, as will be shown in the case of KD.

When assessing the semantic abilities of patients with AD, the clinician must carefully consider the requirements of the tasks and related performance variability for each individual. Hypotheses about whether a particular individual's impairment derives primarily from a degeneration of the conceptual system or from a difficulty in consistently accessing target words in the semantic network will result in different management decisions.

Semantic Memory and Autobiographical Memory: What is the Relationship?

Semantic memory, which is a long term store of decontextualized knowledge, including facts and schemas, contrasts with *episodic memory*, which is a record of "temporally dated episodes or events, and the temporal-spatial relations among them" (Tulving, 1972, p. 386). Both types of memory are compromised in AD, with some authors postulating an interaction between the disturbances in the two systems (Bayles & Kaszniak, 1987; Nebes, 1989). The way in which these two memory systems interact in both normal and AD populations requires further study. Most research has investigated the impact of semantic memory on episodic memory. Little, if any, direct study has sought to

identify the effects of episodic memory on the functioning of semantic memory. Nevertheless, relevant research has been carried out in the area of autobiographical memory. Although some authors do not draw a distinction between autobiographical and episodic memory (e.g., Tulving, 1983), others suggest that autobiographical memory warrants separate consideration. In part, this is because episodic memory has come to be associated with a particular experimental paradigm involving the recall of word lists rather than the recollection of personal experiences. Conway (1990) suggests that remembering past events from one's own life probably involves somewhat different processes than the recall of more generic episodes.

Before examining the connection between autobiographical memory and lexical retrieval, the status of autobiographical memory in AD must be considered. Fromholt and Larsen (1991) found that the distribution of memories across the lifespan was the same for participants with AD as for normal age-peers, although fewer memories were retrieved overall. That is, participants with AD showed a recency effect, with a greater number of memories retrieved from the most recent years, and a *remembrance peak*, in which memories from the late adolescent and early adult years were more frequent than memories from adjacent time periods. Other studies found a temporal gradient in the recollection pattern of participants with AD, such that there was a relative sparing of more distant memories, namely, those during the reminiscence peak (Kopelman, 1991). Explanations for this latter finding have centred on the saliency of life events in this time period and the fact that accounts of these events are probably very well-rehearsed, having been reflected upon and recounted frequently over the years. (These characteristics of memories from the reminiscence peak are relevant also to the study of discourse, and will be discussed further below.) Importantly, although autobiographical memory clearly becomes impaired in AD, certain life periods may provide a store of more complete or accessible memories. This finding is relevant for KD, in view of her caregivers' lack of familiarity with important life events in her past.

Conway (1990) supports the notion that experiences stored in autobiographical memory may have special representation or distinct status. He notes that information and events which are of high personal significance are remembered more clearly and persistently than information and events which are not. With respect to lexical level processing, Keenan and Baillet (1980) found that participants were much quicker at responding to adjectives which they had judged earlier to be characteristic of themselves or a close friend versus someone less well-known to them. Further studies conducted by these same researchers confirmed that highly self-relevant information

is processed more rapidly and retained more accurately than factual knowledge low in personal significance. To account for this difference in processing, Keenan and Baillet suggest that factual knowledge which has direct autobiographical reference is represented differently than factual knowledge which is not self-referring.

Although the nature of the relationship between autobiographical memory and conceptual/lexical knowledge is far from clear, there nevertheless does seem to be a connection. Snowden, Griffiths, and Neary (1994) observed that five patients with a progressive semantic disorder appeared to have improved word production when talking about current personally-relevant experiences. They investigated the contribution of personal experience in maintaining verbal and nonverbal meaning, using three experiments with names of people, places, and objects. They found that their semantically impaired participants performed consistently better for personally relevant names and places, with currently relevant items better preserved than past relevant items. A control group of participants with AD, who were described as being profoundly forgetful of daily events, with difficulties in verbal expression, but no clear semantic deficit, did not show the same results. The authors concluded that, although their account of the interrelationship between semantics and autobiographical memory for participants with semantic dementia may not be universally relevant, their findings highlight a possible relationship between these two systems which has not been previously investigated.

There are several important points from the above discussion of semantic and autobiographical memory which are relevant to intervention for word-finding deficits in discourse, in particular for KD. The potential contribution of autobiographical memory to the maintenance of semantic knowledge suggests that word-finding abilities may be enhanced in discourse about personally-relevant memories. The relative preservation of reminiscence peaks suggests potential topics which could be incorporated into conversation. Clearly, a careful assessment of both linguistic and memory impairments, with some estimate of the relative degree of impairment of each, is essential.

Discourse Types and the Status of Schematic Knowledge

An understanding of the connection between an individual with AD's discourse performance and the deficits and abilities which could affect it can aid the clinician in planning intervention strategies. If certain discourse genres facilitate language processing (specifically in KD's case, improved lexical retrieval), clinicians can identify which characteristics of those genres are supportive, and then

incorporate those features, if possible, into therapeutic programs for everyday communication. For example, there are a number of factors that potentially influence discourse processing, including: (a) the presence of text structure; (b) the particular characteristics of a specific discourse genre; and (c) numerous task-related variables, such as relevance to immediate environment and use of pictorial support.

The presence of an organizational framework in discourse has been widely proposed to influence memory and language processing (Kintsch, 1985; Bower, Black, & Turner, 1979). Common areas of research have included the implications of schema theory for narrative comprehension and production (Mandler, 1984) and the effect of script knowledge on the processing of discourse involving routine activities or procedures (Schank, 1982). A central notion behind these perspectives is that content-independent knowledge structures, which correspond in some way to the underlying structure of text, provide an organizational framework for the processes involved in language comprehension and production. It is possible that access to such knowledge structures facilitates language processing by reducing demands on the overall pool of cognitive resources (i.e., organizational demands are lessened) and allowing more resources to be directed to language processes such as, for example, lexical searches.

Research findings on the status of script and schematic knowledge in AD have been somewhat mixed, although the majority of evidence suggests that knowledge of discourse structure is compromised. On a script generation task centred around the topic "what you do when you get up in the morning", Grafman et al. (1991) found that participants with AD produced fewer events overall and made a greater number of ordering errors than elderly controls. Using a number of different tasks, Ska and Guénard (1993) examined the narratives of participants with AD and elderly controls for the presence of story elements and the content of macropropositions. Overall, their findings indicate that AD performance on narrative production was consistent with that on script generation tasks (i.e., fewer schema components, more sequential errors, more irrelevant propositions). In contrast, Ulatowska et al. (1991) found, using similar tasks, that structural knowledge was relatively preserved in the participants with AD. The discrepancy in these findings suggests that schematic knowledge may still be available for some, but not all, individuals with AD.

The characteristics of a particular discourse type may influence processing. Ripich (1995) notes that narratives are hierarchical in structure, whereas procedures (e.g., how to change a tire) are more linear. She suggests that the hierarchical structure of narratives is more difficult to process and offers this as a possible explanation for the

finding that both AD and normal elderly participants in her study performed better on a procedural discourse task than on a narrative task. Moreover, Ripich proposes that, because both groups performed best on a conversational task, this genre may be even easier because it has a dialogic structure, in contrast to the monologue nature of both narratives and procedures. It may be easier for adults to follow the flow of ideas in a conversation, in which "partners act jointly to generate and develop the exchange" (Ripich, 1995, p.210).

Conversational turns of adults are often brief. As a consequence, maintaining attention may be easier and demands on working memory may be reduced. Conversations have the additional feature of being highly relevant and content specific, providing more motivation for participation (Ripich, 1995). Furthermore, conversations are supported by well-established pragmatic behaviors, (e.g., turn-taking), the automaticity of which may help to maintain the interaction. (For a review of conversational discourse abilities in older adults, see Garcia & Orange, this issue, and for individuals with AD, see Orange & Purves, this issue).

With respect to the influence of task-related variables on discourse, most studies have found performance on discourse tasks to be linked significantly to the nature of the stimuli used. Several important factors include the use of pictorial support, the use of one complex picture versus a sequence of pictures, familiarity with the narrative, script or conversational topic, and relevance of material to the individual. Ska and Guénard (1993) found in their study of narrative schema in AD that on the most constrained task involving a sequence of seven pictures, performance of the participants with AD closely approximated that of age-matched controls, both in the number and type of schematic elements supplied. Ulatowska et al. (1991) found that their participants produced the greatest number of details in picture-sequence narratives, which they attributed to the less demanding nature of the task.

Similarly, in the Ska and Guénard study, the production of irrelevant details and unrelated information was greater in less constrained tasks. These included narratives based on *Little Red Riding Hood* with no visual support, and a single picture of a bank robbery scene, both of which were considered less constrained than the picture sequence narrative. Nevertheless, even in the picture-sequence stories, the participants with AD were unable to maintain the sequential ordering of the schema components. The authors suggest that this occurred because the dementia participants had difficulty performing the two aspects of the task simultaneously (i.e., producing the appropriate story components and sequencing them correctly). These findings reinforce the importance of task analysis and demonstrate that what seems to be a simple task may involve many

different component processes. Further, they illustrate that the greater the cognitive complexity of the discourse task, the greater the effect on communicative performance.

A number of important conclusions can be drawn from the evidence provided in the above discussion. First, much of the research suggests that schematic knowledge may be somewhat compromised in individuals with AD, though it is unclear whether such knowledge is lost or just inconsistently available. An equally strong finding is that performance depends significantly on the nature of the discourse task and the type of support variables used. The influence of visual support remains unclear. Picture sequences appear helpful in reducing memory demands, resulting in more narrative elements being produced. However, ordering errors may occur despite the inherent sequencing of events in picture arrays. Structural features of the discourse genre, including both textual and interactional properties, also appear to influence performance. In addition, the relevance of the topic of discourse to the participants may affect their discourse performance. Autobiographical memories, for example, which reflect a measure of personal relevance of topic, have the potential to facilitate discourse performance on at least two levels. First, they can be considered an instance of storytelling in that such memories are well-rehearsed and have schematic structure. Second, because of the potential link between semantic and autobiographical memory, lexical retrieval may be enhanced in the context of recalling memorable experiences.

Perhaps the most important conclusion to be drawn for clinical purposes is that each patient's performance, when considered in conjunction with the relevant literature, must be interpreted as a single case, rather than as a reflection of group performance. A comprehensive examination of the patient's discourse which takes into consideration individual variability of performance will help the clinician to determine whether superstructural knowledge remains intact, which factors, if any, affect performance, and what aspects of performance are affected (e.g., perceived coherence, greater occurrence of unique or substantive lexical items, etc.). Findings can then be used to establish individualized treatment goals and to identify compensatory, supportive strategies in an intervention plan.

Assessment of KD's Language and Communication

Comprehensive assessment of discourse in patients with AD must necessarily examine a wide range of measures. Ripich (1995) recommends that a comprehensive evaluation include a standardized test of linguistic performance that assesses oral and written language production and comprehension (with measures to identify specific problems

in the area of semantics, pragmatics, syntax, and phonology), and a language memory task. Bayles and Kaszniak (1987) note that language tasks which are active, non-automatic, or generative are most sensitive to dementia. In keeping with this, KD's language and communication abilities were assessed across a number of contexts, using a variety of formal and informal measures. The assessment procedures are outlined below.

The Arizona Battery for Communication Disorders of Dementia (ABCD) (Bayles & Tomoeda, 1991) was administered to obtain measures of mental status, episodic memory, linguistic expression and comprehension, and visuospatial construction. A modified version of the Boston Naming Test (BNT) (Kaplan, Goodglass, & Weintraub, 1983) was prepared and administered to investigate KD's confrontation naming and semantic abilities. Odd-numbered items were given in standard format; even-numbered items were used in a multiple choice task where KD was required to select correct names from an array of three semantically-related printed words. Further examination of semantic abilities was undertaken using a variety of non-standardized semantic tasks. Discourse and pragmatic skills were evaluated using conversations with the clinician and with KD's caregiver, as well as a picture description task using the Cookie Theft Picture from the Boston Diagnostic Aphasia Examination (Goodglass & Kaplan, 1972). Assessment results are summarized below.

Performance on screening tests of the ABCD indicated that KD did not have significant visual-perceptual, spatial, hearing, or motor impairments that would potentially confound assessment results or figure as important variables in her discourse performance. KD's overall score on the ABCD was consistent with mild- to moderate-stage dementia. Linguistic abilities were relatively more impaired than either episodic memory or visuospatial abilities, although impairment in these abilities was also evident in some subtests. Construct scores, derived from scores of individual subtests, are given in Table 1, with scores also from the modified version of the BNT.

KD's comprehension of spoken and written material was impaired, with greater difficulty apparent on longer items. However, impaired comprehension was also evident when stimulus length and increased demands on working memory were not a factor. Performance on verbal production subtests revealed substantial difficulty that varied according to the degree of support inherent in the task. Performance on generative naming and concept definition tasks was very poor, whereas confrontation naming was better, although still significantly impaired. Performance on episodic memory subtests was marked by inconsistency. KD retold more details on the Wallet Story in the delayed versus the

immediate recall condition, a surprising finding not consistent with normative data for participants with AD. KD showed evidence of word-finding problems with many circumlocutions on both tests, which may account in part for her improved performance in the delayed condition. Her performance on subtests of the word learning section, including a word recognition subtest which should not be affected by word retrieval deficits, fell below the cut-off scores recommended for screening for AD deficits. In visuospatial tasks, figure copying was well-preserved, while generative drawing was impaired.

The relative severity of linguistic versus memory impairment is not a typical presentation of AD (the diagnosis which KD had been given prior to her referral). Such atypical presentations have been discussed in a growing body of literature suggesting the possibility of sub-groups within the diagnostic category of AD (Martin, 1990; Kirshner, 1994).

Performance on Semantic Tasks

KD's performance on the adapted version of the BNT was much better for recognition items than for confrontation naming items (see Table 1). Confrontation naming for specific items was inconsistent, in that some errors made on the second administration differed from those made initially.

Semantic knowledge was probed further with synonym and antonym multiple choice tasks, using auditory and written stimuli. KD's performance was excellent. On sentence completion tasks, KD usually performed better when items were constrained, such as *When it's raining outside you need an _____* versus *I wish I could find a _____*, suggesting some benefit from semantic cues.

Conversation and Picture Description

The clinician engaged KD in a conversation about the nature of her present communication difficulties, recent activities in her life (e.g., a church picnic), and some of her background experiences (e.g., her first job). KD's spoken output was fluent with phrase length often around 10 words or more. Sentence length sometimes extended beyond 25 words. Few phonemic paraphasias were noted. Prosodic features were preserved. Her grammatical constructions were complex and varied (e.g., *I thought she was there in that cubby hole over there and we sat there with the help of people like them to get that for her*). Particularly in multiple utterance turns, KD's spoken output was difficult to follow with few informational content units, numerous empty words and phrases, and pronouns and deictic terms which were poorly referenced. The following example illustrates these features: *Why did this come like that? It it's I know it - I sort of go along with going right to where I want something or to*

Table 1. Assessment Results for KD

Arizona Battery for Communication Disorders of Dementia: Construct Scores

Mental Status	Episodic Memory	Linguistic Expression	Linguistic Comprehension	Visuospatial Construction
3.0	3.5	2.6	2.6	4.0

Note. Construct scores are standardized to a 5 point scale, with upper values discriminating performance by normal elderly, and lower values discriminating performance by patients with dementia.

Modified Boston Naming Test

Confrontation Naming (Time 1)	Confrontation Naming (Time 2)	Multiple Choice Version
13	15	27

Note. Maximum score = 30. Confrontation naming tests used even-numbered items. Multiple choice version used odd-numbered items with semantic distractors.

do something, and it just, at that moment goes click, and there's nothing there. Perseveration and repetition of ideas were also noted. KD was able to follow turn-taking conventions, and always answered yes/no questions appropriately. She had more difficulty providing meaningful, relevant answers when questions were open ended.

In spite of the fluent characteristics of her speech, KD's extended verbal productions were marked by a number of false starts and word repetitions. She frequently failed to complete ideas or sentences, but occasionally, she was able to revert back to her initial idea as illustrated in the following example: *I was going to go to uhm, er, a younger girl that I knew, and we were going to have lunch together....*

Interestingly, although formal analysis has yet to be performed on all discourse samples, initial results showed that KD was able to stay on topic better during the picture description task than in conversation. During that task, she provided more information per utterance and produced shorter, though syntactically complex, sentences (i.e., had less tendency to produce run-on sentences). As well, in recounting her first job, (representing an autobiographical memory from a reminiscence peak) it was noted that KD made fewer pauses and produced a greater number of substantive nouns.

Interpretation of Assessment Results

Considering the results of the ABCD, the various naming probes and the discourse tasks collectively, KD's performance is consistent in a number of ways with our current understanding of language and discourse in AD. Her syntactic and phonological abilities remain relatively intact, whereas disturbance of her semantic and pragmatic system is quite evident.

KD's word finding difficulties were apparent in her spoken output, and semantic deficits were evident on a number of tasks. KD complained frequently of her inability to produce the correct words, sometimes directly (e.g., *I can't find the right words to give people*) and sometimes indirectly (e.g., *I went to the doctor. I thought I needed some some what, some goodness I guess*). Several findings from KD's assessment results indicate that she was having difficulty accessing correct lexical representations. This does not mean that she had no loss of semantic information, but simply that in many cases, it appears that she was unable to retrieve words for which she nevertheless had relatively intact conceptual and lexical-semantic representations.

The following evidence supports our hypothesis that KD suffers from an access problem, rather than from a

deterioration of semantic representations. First, when presented with alternatives on the multiple choice version of the BNT, KD's performance improved substantially, showing that if she was not able to retrieve an item on her own, she was nevertheless able to identify it correctly, even from amongst semantically related distractors. It may have been the case that exposure to the correct alternative was sufficient to raise the activation of the lexical item in her semantic network to a level that made it accessible. Second, KD's near perfect performance on the synonym and antonym probe corroborates that she has little difficulty with semantic tasks that require recognition versus recall or lexical search and retrieval. Third, phonemic cues sometimes were helpful, indicating that additional information from the phonological subsystem was sufficient to facilitate access to an intact lexical item. Fourth, on confrontation naming as well as on concept definition tasks, KD often spontaneously gestured the use, size, or shape of an item which she was unable to name or describe. Fifth, although KD was frequently unable to give full, complete definitions, she was able to provide relevant semantic details as in the following definition of a funnel: *It's like a cup, narrow at the bottom end. Water could be put through it*. This finding suggests that although KD may have difficulty selecting and conveying the most representative details, she nevertheless is still able to access considerable semantic information associated with concepts. Finally, the inconsistency of errors on specific items of the BNT suggests impaired access to lexical representations.

KD's superior performance on memory and mental status constructs in comparison to language constructs on the ABCD contrasts with the often more significant memory dysfunction versus language breakdown frequently seen in AD patients. Her ability to refer to many events from her past is further evidence of her relatively spared autobiographical memory. KD's results suggest that her linguistic impairment may to some extent negatively affect her performance on tasks in other cognitive domains. Moreover, the above evidence on naming performance supports our position that conceptual level information appears to be relatively intact in comparison to the processes that access it for verbal production. Finally, KD's marked variability in performance, even on memory tasks of the ABCD, suggests that her information processing abilities are somewhat unstable. Viewed collectively, these findings warrant the consideration of potential factors that may enhance lexical access.

Assessment data suggested that lexical-semantic and discourse and pragmatic level features of KD's production were enhanced by task and content variables. Our observations are supported by studies in the literature (see earlier discussion) regarding the possible influences of schematic structure and other discourse task variables on

production, as well as the findings which describe possible connections between autobiographical memory and semantic processing. Assessment results and research findings offer sufficient evidence to postulate that schematic structure, discourse task variables (e.g., visual support), and/or autobiographical memory might enhance KD's lexical retrieval abilities. However, more controlled, systematic discourse sample collection and analysis (currently underway) are required before concluding that such enhancement is possible.

Intervention

Clark (1995) discusses the need for a shift in emphasis from a traditional medical model of assessment of pathology followed by rehabilitation to a more holistic model which focuses also on preventing excessive response to disability. She suggests that such a shift, which leads to both direct and indirect interventions, offers a broader orientation encompassing quality of life. These issues will be addressed in the following discussion of the treatment goals selected for KD.

The objectives established for KD's treatment were based on direct intervention to facilitate lexical retrieval and on indirect intervention to maximize communicative effectiveness with caregivers and close friends, with the broader goal of reducing the impact of KD's disability on her independence and social involvement. These two goals are related in that improvement of KD's word retrieval should result in more effective communication as a result of more coherent discourse (e.g., fewer circumlocutions, a greater number of substantive nouns or content words, etc.). We have based these goals on our working hypothesis that manipulation of discourse variables will facilitate lexical retrieval. Use of a working hypothesis is in keeping with a clinical necessity (especially in view of the degenerative nature of AD) to proceed quickly, while at the same time testing this working hypothesis and revising it in response to new results. Specific goals, related activities, and accompanying rationales are presented below.

Goal 1: Facilitation of Lexical Retrieval in Discourse

Discourse genres and support conditions (e.g., well-known narratives, personal memorable experiences drawing on autobiographical memory, picture sequence narratives, conversations) are currently being systematically manipulated to determine their effects on KD's lexical retrieval. The rationale for this goal has already been discussed to some degree. It is expected that KD will have better lexical retrieval in certain discourse genres. Autobiographical memories have been chosen as a focus because they typically involve schematic structure, have been frequently

rehearsed, are highly relevant and, by definition, are highly personal. Moreover, KD frequently initiated conversation about memorable experiences, so it was thought to be a motivating activity for her. The use of photographs from KD's past to initiate autobiographical stories is supported by the findings presented earlier that visual support may enhance discourse production. Additional support is found in a study by Bourgeois (1991) in which she effectively trained moderate stage AD individuals to use *memory wallets* to improve their conversations with familiar partners. Furthermore, in keeping with a holistic approach to treatment, *reminiscence therapy* with AD patients has been explored by other health-care professionals, who have considered general benefits to include an increase in feelings of self-worth and a reduction in emotional stress (Clark & Witte, 1995; Clark, 1995).

Typically, language specific goals are not targeted for AD patients because cognitive impairments are considered to be more severe than language deficits and because of the degenerative course of the disease. In KD's case, however, because language deficits appeared to be somewhat more severe than general cognitive and memory decline and because she was still in the relatively early stages of the illness, the facilitation of word-finding ability within a communicative context was considered a viable objective. Anticipating the inevitable decline in KD's cognitive and linguistic functioning, this would cease to be a goal at some point in the future. Finally, the goal does not involve the teaching of any overt strategies to KD. Although individuals with early stage AD can successfully learn conversation repair strategies (e.g., Shadden, 1995), KD was already aware of and able to signal her word-finding difficulties. Hence, the more indirect approach of manipulating contextual support was selected.

Goal 2: Increase Caregiver Support through Conversation Strategies

KD's caregivers will be invited to attend and participate in all sessions. They will learn more about people and past experiences in KD's life through participation in conversation. Effective prompts and cues will be identified and their use reinforced.

Counselling and environmental therapy to optimize current communicative effectiveness are usually the predominant focus of treatment (Lubinski, 1995). With regard to the first activity, KD's caregivers noted that their communication with KD was most successful on subjects about which they shared knowledge, while discussion of unfamiliar topics was becoming more difficult. By participating in therapy activities involving KD's recounting of autobiographical memories, KD's caregivers will be

provided with information which will help to fill gaps in their knowledge about KD's past. This activity is particularly important for KD and her caregivers because, unlike many spousal dyads in which one participant has AD, KD's caregivers do not have the shared context of her past. Hence, in learning more about the significant events and people in KD's life while KD's autobiographical memory is relatively preserved, the caregivers will be able to facilitate, through prompting, successful exchange of information in the event of later memory decline. Such caregiver repair strategies may help to extend KD's ability to converse about topics which are not dependent on the immediate context.

There is a second important consideration in focusing KD's communication on the topic of her past. Sabat and Harré (1992) have discussed the importance of language (discourse) in the individual's ability to construct and maintain, with the necessary co-operation of others, a *public self*, which they define as "the selves that are socially and publicly presented" (p. 444). They illustrate through two case examples that this public self can be lost indirectly as a result of AD, suggesting that as AD individuals discourse abilities become impaired, they lose the co-operation of others in maintaining their social identities; their conversational partners instead respond to them as confused, helpless, etc. The authors go on to suggest that caregivers can facilitate the maintenance of social identity by responding to the sometimes fragile cues to those identities in the conversation of individuals with AD.

In view of Sabat and Harré's discussion and the intention of KD's caregivers to help her to maintain her independence (and her social identity) for as long as possible, the activity of focusing conversation on KD's past takes on additional significance. KD's first conversations in the assessment interview revealed that she has led an active, varied life, and is part of several distinct social networks. In learning all they can about these aspects of KD's life, KD's caregivers may be better able to help KD maintain her sense of self. This is especially important in view of the results of a longitudinal study of conversational topic by St. Pierre, Wilk, and Orange (1995) which showed that the percentage of context-dependent talk and talk of undetermined topic increased dramatically in an AD spousal dyad over a period of nine months.

Finally, by participating together in therapy sessions, KD's caregivers and clinician will have the opportunity to share information about successful repair strategies. During the discourse tasks, the clinician can explore various types of cueing and prompting such as semantic or phonemic cues, topic maintenance cues, and specific requests for clarification to see if they facilitate word-finding and, in turn, discourse performance. The caregivers can provide

feedback about these and other strategies in familiar contexts which collectively provide linguistic, discourse, and environmental support. Throughout the intervention process with the caregivers, the clinician will identify strategies which will facilitate their transition, in keeping with Bourgeois' (1991) description, from equal participants in communicative exchanges to facilitator of KD's communicative attempts.

Conclusion

In theory-based intervention for discourse problems in AD, relevant research findings provide a framework for interpreting assessment results and designing treatment procedures. The case example of KD has illustrated how assessment findings for an AD adult can be interpreted in light of the literature regarding language, memory, and communication in AD, and, further, how such information can facilitate the identification of effective strategies to enhance communication. Assessment of and intervention for one aspect of KD's discourse profile, (i.e., her word-finding impairment), incorporated elements from studies of semantic network models, autobiographical and semantic memory, and discourse production. This approach highlighted the abilities, impairments, and needs which are specific to KD, while at the same time it offered possible explanations for these findings. Treatment goals were congruent also with concepts from pragmatics and social psychology, in that promotion of functional communication and the social consequences of impaired discourse were taken into consideration. We conclude that individual assessment and treatment planning that is supported by a critical review of the literature offers the best potential for enhancing communication and helping the person with AD to preserve self-identity.

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