Université de Montréal

Conversational Topic Shifting Styles in Dementia of the Alzheimer Type:
A Multiple Case Study

par

Linda J. Garcia

Ecole d'orthophonie et d'audiologie

Faculté de médecine

Thèse présentée à la Faculté des études supérieures
en vue de l'obtention du grade de
Philosophiæ Doctor (Ph.D.)
en sciences cliniques

février, 1991

Université de Montréal
Faculté des études supérieures

Cette thèse intitulée:

"Conversational Topic Shifting Styles in Dementia of the Alzheimer Type:
A Multiple Case Study"

présentée par:

Linda J. Garcia

a été évaluée par un jury composé des personnes suivantes:

_____ président-rapporteur
                          Louise Coderre, M.A.

_____ directeur de recherche
                          Yves Joanette, Ph.D.

_____ co-directeur
                          Jean-Luc Nespoulous, Ph.D.

_____ membre du jury
                          Howard Chertkow, M.D.

_____ examinateur externe
                          Audrey L. Holland, Ph.D.

Thèse acceptée le: _____

ABSTRACT

It is now well recognized that the clinical diagnosis of Dementia of the Alzheimer Type (DAT) is made by considering the results of systemic blood tests, the use of investigative radiologic procedures and a detailed neuropsychological evaluation. Some of these investigations will rule out any sign of degenerative dementia, whereas others will suggest DAT. Communication is one of the most important functions to be examined in a thorough neuropsychological evaluation. Although behavioral impairment is rarely uniform across DAT patients, most have some level of difficulty in the sharing of ideas and in rendering a coherent discourse. This deficit may be attributable to a difficulty in accessing meaning, a disturbance with meaning itself, or an inability to relate meaningful propositions. One of the more representative ways of examining meaning relationships in conversational discourse is to study topic shifting behaviour.

Generally, the investigation of DAT patients' conversational discourse has received minimal attention, in part due to the inherent methodological problems. It does not lend itself well to group study design and there are known problems with heterogeneity. The present investigation attempted to provide an initial example of how meaning relationships, expressed through topic shifting behaviour, can be described in DAT and normal elderly (NE) subjects in conversational discourse.

The subjects were five patients with the diagnosis of probable DAT and five NE subjects. All subjects were female, over age 65, and of the same cultural background. A social worker (S.W.) served as common conversational partner. None of the subjects were institutionalized. All were asked to engage in an unstructured conversation with S.W. for the total of one hour, of which the middle half hour was analyzed. No restrictions were made on the conversation and all conversations were audio and videotaped in the subject's own home. Following transcription of the 30 minutes of conversation, all *Topic Units* were analyzed by consensus using three speech/language pathologists. *Topic Units* were described on a *Global Dimension*, with regards to *Place of Topic Shift*, *Type of Topic Shift*, *Reason for the Shift* and the *Context* to which the topic shift related. Data was represented visually using bar graphs and tables for descriptive purposes. Profiles were thus obtained for (1) each conversation as a whole, (2) the contribution each

speaker made to the conversation, and (3) the individual profiles of each speaker, irrespective of her conversational partner.

Although very little differences were visually observable in the *Global Dimension* and *Place of Shift* categories, some differences were apparent in others. In *Type of Shift*, whereas the NE subjects tended to have proportionately more *Topic Shadings*, and *Inserts*, the DAT subjects tended to have more *Unexpected* shifts. In addition S.W. was more inclined to shift topics using a *Renewal* or a *Topic Shade* when speaking with a NE subject but used a *Topic Initiation* when speaking with the DAT subjects. In *Reason for Shift*, there were proportionately more shifts as a result of *End of Topic* and for *Anecdotal* reasons in the conversations with the NE. On the other hand, there were more shifts as a result of *Decreased Comprehension* and because of a *Failure to Continue* the topic in the DAT conversations. S.W. again had different profiles when she was speaking with NE versus DAT subjects. In *Context*, the NE conversations tended to relate proportionately more often to *Specific Knowledge* and the DAT conversations tended to relate proportionately more often to the outside *Environment* (i.e. things in the room, etc...). In addition to these and other results, subject A1 (a DAT subject) often obtained a different profile from the other patient subjects. This was particularly interesting since her working diagnosis of DAT has been changed to Multi-infarct Dementia. Of further interest is S.W.'s profile in using different styles with NE and DAT subjects.

Further discussion of the results showed that it is operationally possible to describe, at least at a superficial level, the topic shifting behaviours of brain-damaged subjects in a natural conversational discourse. The particular impairments found in subject A1 suggest that different cognitive impairments may differentially affect discourse. S.W.'s adaptation to so-called "incoherent" discourse in the DAT subjects was discussed in terms of discourse theory models and in terms of clinical repercussions. In short, the present doctoral dissertation offers an example of conversational discourse description using theoretical discourse model issues and pragmatic issues as a basis to description.

RESUME

Le diagnostic clinique de la démence de type Alzheimer (DTA), se fait à partir d'une liste de facteurs d'exclusion et d'inclusion, entre autres basée sur les résultats de tests sanguins, des données radiologiques et de l'évaluation neuropsychologique. Plusieurs de ces tests ont pour but d'éliminer la présence de certaines maladies correspondant à des démences dite traitables telle une démence d'origine endocrinologique. L'évaluation neuropsychologique, par contre, joue un rôle primordial dans le diagnostic de démences dégénératives dont la DTA. Au cours de cette évaluation, les habiletés de communication sont parmi les fonctions cognitives les plus importantes à être documentées.

Toute étude portant sur les déficits de communication que peut amener une démence doit tenir compte des effets du vieillissement "normal". Malgré l'interêt démontré par plusieurs chercheurs pour cette question, les études se sont surtout limitées à quelques aspects de la fonction linguistique, notamment les composantes lexico-sémantiques et discursives. Les difficultés mise en évidence par les études portant sur les composantes lexico-sémantiques semblent dépendre de la complexité et du niveau d'abstraction des items. En ce qui a trait à l'extraction de l'information sémantique, les questions d'automaticité et de "flexibilité" semblent également déterminantes. Des recherches seront nécessaires pour identifier le ou les processus lexico-sémantiques affectés. Du coté du discours, les personnes agées normales se distinguent des plus jeunes par une difficulté à se rappeller les propositions thématiques contenues dans un texte narratif. C'est particulièrement le cas pour les propositions ayant peu de valeur sémantique par rapport au thème général du texte. Ces déficits sont plus marqués en tâche de rappel qu'en tâche de reconnaissance. Ce résultat laisse croire que, chez la personne agée, il y aurait une difficulté plus importante pour retirer l'information de la mémoire sémantique que pour la stocker. En discours conversationnel, on remarque que les personnes agées peuvent utiliser le même "code" et le même "contexte" que leur partenaire. En somme, les sujets normaux sembleraient connaître les règles de la pragmatique.

Tout comme pour le vieillissement normal, les effets d'une démence sur la communication se manifestent par des déficits aux niveaux lexico-sémantique et discursif. Malgré le fait qu'il existe une hétérogénéité dans le tableau clinique que peut présenter le patient atteint de DTA, il semblerait y avoir une préservation

relative de la phonologie et de la syntaxe. Dans les recherches portant sur la sémantique, on se questionne sur la présence d'une perturbation au niveau de l'accès à la mémoire sémantique par opposition à une perturbation au niveau de l'information qui y est encodée. Tandis que le nombre d'études sur ce sujet s'accroît, l'analyse du discours reste à un stade embryonnaire. Les quelques études déjà publiées rapportent que le sujet dément éprouve moins de difficultés sur le plan de la cohésion que sur celui de la cohérence. En ce qui concerne le discours narratif, les recherches témoignent d'un problème de coréférence, d'une augmentation dans la quantité de termes indéfinis (par exemple, cette "chose") et de commentaires, ainsi que de la présence d'un pourcentage plus élevé de phrases incomplètes. Le discours conversationnel semble se caractériser par un contenu sémantique 'anormal', des changements thématiques inappropriés et une difficulté dans le maintien du thème conversationnel. On note aussi un nombre plus abondant de tours de parole, d'hésitations et de terminaisons prématurées des phrases. Les conclusions des recherches sur le discours conversationnel du sujet atteint de DTA restent souvent anecdotiques et les descriptions sont rarement définies de façon opérationnelle. Le discours conversationnel comme tel fait rarement l'objet d'étude dans les recherches sur les relations entre la démence et la communication. Ceux qui ont tenté d'étudier la question se sont servi de modèles théoriques tels que le modèle des actes de langage. Celui-ci n'est peut-être pas le plus approprié pour une étude qui cherche à décrire les relations sémantiques entre les propositions, c'est-à-dire, la cohérence.

Le présent travail s'est donné comme but de décrire la nature des changements thématiques du discours conversationnel de sujets agés normaux et de sujets atteint de DTA. Ce choix se motive par l'importance que ces changements apportent à la cohérence de la conversation. Il est evident que le but primaire d'un élocuteur est de partager une information particulière, un thème. La stratégie utilisée par un sujet pour changer de thème peut être un indice du type d'analyse sémantique/pragmatique qu'il fait. La littérature préliminaire démontre que les sujets atteints de DTA ont des perturbations distinctes dans ces deux domaines, tandis que les sujets normaux ne semblent avoir aucun problème à déceler les informations pragmatiques. Cette étude s'inspire donc plus de la littérature sur la pragmatique et

des modèles contemporains de discours narratifs que des modèles d'actes de langage.

A cause d'un problème d'hétérogénéité des déficits chez les personnes agées normales et les patients atteints de DTA, le présent projet repose sur une étude de cas multiples. Les sujets correspondent à cinq patients atteint de DTA et cinq sujets agés normaux. Les sujets sont tous des femmes agées de 65 ans et plus, provenant de la même culture générale. Elles sont toutes unilingues anglophones, nées au Canada (à part un sujet qui a immigré lorsqu'elle n'avait que 2.5 ans) de parents eux-mêmes nés au Canada dans la plupart des cas. Aucun des sujets ne vivait en institution lors de l'expérimentation.

Les sujets furent invités à participer à une conversation libre avec une travailleuse sociale. La conversation durait une heure; les analyses n'ont cependant porté que sur les 30 minutes centrales. Il n'y avait aucune restriction quant aux thèmes de conversation et à la façon de procéder des sujets au cours de l'échange. Aucun des sujets, y inclus la travailleuse sociale, n'était au courant des buts de l'étude. Les conversations ont eut lieu chez le sujet et furent enregistrées sur audio- et vidéo-cassette.

Suite à la transcription des 30 minutes de conversation, chaque *Unité Thématique* fut analysée par trois orthophonistes. Les *Unités Thématiques* furent décrites en termes de la dimension globale (*Global Dimension*), par rapport à l'endroit du changement thématique (*Place of Shift*), et en relation avec le type de changement (*Type of Shift*), la raison du changement (*Reason for Shift*), et le contexte dans lequel le changement thématique se rapportait (*Context*). Afin de faciliter la description, les données furent présentées en graphiques et tableaux. La "dimension globale" visait à donner un aperçu de la conversation en général (par exemple, le pourcentage de changements thématiques et de maintiens thématiques -- sémantique ou non sémantique). "L'endroit" du changement de thème visait à décrire si les changement avaient plus souvent lieu à l'intérieur ou à l'extérieur des tours de parole. Le "type" de changement thématique visait à décrire la technique utilisée pour faire le changement. Les sous catégories étaient: l'initiation de thème (*Topic Initiation*), le changement thématique nuancé (*Topic Shading*), le renouvellement de thème (*Renewal*), l'insertion d'un nouveau thème sans terminaison

du précédant (*Insert*), le changement inattendu de thème (*Unexpected*), et les changements indéterminés (*Undetermined*). La "raison" du changement thématique visait à décrire les motivations possible de l'interlocuteur lors de son changement de thème. Les raisons possibles furent: la cessation du thème précédant (*End of Topic*), les changements dû à un manque de compréhension (*Decreased Comprehension*), un arrêt soudain du thème précédant par le partenaire (*Failure to Continue*), un changement dû à un stimulus externe (*Outside Stimulus*), la répétition d'une idée déjà partagée (*Repetition of Idea*), le partage d'une anecdote (*Anecdotal*), et des raisons inconnues (*Unknown*). La rubrique "contexte" visait à incorporer les notions de contextes telles que présentées dans la littérature sur la pragmatique. Les changements thématiques pouvaient avoir trait au texte précédant, déjà partagé dans la conversation (*Text*), aux objets dans l'environnement immédiat (*Environment*), aux connaissances spécifiques aux locuteurs (*Specific Knowledge*), aux connaissances générales susceptibles d'être présentes dans le savoir général (*General Knowledge*), ou bien le contexte précis ne pouvait pas être identifié (*Unknown*). Un calcul du nombre d'incidences dans chacune des catégories fut entrepris et un pourcentage des productions totales fut généré. Ainsi un profil a put être obtenu pour (1) la conversation prise dans son ensemble, (2) les contributions de chacun des deux locuteurs, (3) les changements thématiques pour chaque sujet (DTA et agé normal - AN) indépendamment des productions de la travailleuse sociale (T.S.) et enfin pour (4) la travailleuse sociale (T.S.), indépendamment des productions du sujet (DTA et AN). De cette façon, des comparaisons furent possible entre une conversation sujet DTA/T.S. par opposition à une conversation AN/T.S., des comparaisons du profil individuel du sujet DTA par opposition au sujet AN, et des comparaisons du profil T.S. quand elle s'adressait à un sujet DTA par opposition au sujet AN.

Très peu de différences furent observées à l'examen des graphiques et tableaux se focalisant sur la "dimension globale" et "l'endroit" du changement thématique, mais plusieures différences sont apparues dans les autres catégories. Sous la rubrique "type" de changement thématique, les conversations avec les sujets agés normaux avaient proportionnellement plus de changements nuancés (*Topic Shading*) et d'insertions (*Inserts*) que les conversations avec les sujets DTA. Ces types de changements thématiques requièrent que le sujet puisse retenir le thème

précédant en mémoire. Les conversations avec les sujets DTA, par contre, avaient proportionnellement plus de changements thématiques inattendus (*Unexpected*). De plus, la travailleuse sociale avait tendance à utiliser un renouvellement de thème (*Renewal*) ou un changement thématique nuancé (*Topic Shade*) avec les sujets agés normaux, et utiliser une initiation thématique (*Topic Initiation*) avec les sujets DTA.

Sous la rubrique "raison du changement", il y avait proportionnellement plus de changements thématiques à cause d'une cessation de thème (*End of Topic*), et de partage d'anecdotes (*Anecdotal*) dans les conversations avec les sujets agés normaux. Les conversations avec les sujets DTA avaient proportionnellement plus de changements thématiques résultant d'un manque de compréhension (*Decreased Comprehension*) et d'un arrêt soudain du thème précédant (*Failure to Continue*). La travailleuse sociale avait encore un profil différent avec les sujets DTA. Par exemple, elle avait plus tendance à changer de thème pour partager une anecdote (*Anecdotal*) avec les sujets normaux qu'avec les sujets DTA. Concernant le "contexte", les conversations avec les sujets normaux avaient proportionnellement plus tendance à se rapporter à des connaissances spécifiques (*Specific Knowledge*) et les conversations avec les sujets DTA avaient proportionnellement plus de changements thématiques ayant trait aux objets de l'environnement immédiat (*Environment*).

En plus des résultats énumérés çi-dessus, le sujet A1 avait un profil considérablement différent des autres sujets DTA. Ce qui rend ces résultats intéressants est que le diagnostic clinique du sujet A1 fut reconsidéré depuis cette expérimentation. Son diagnostic est maintenant celui d'une démence vasculaire. D'après les évaluations neuropsychologiques, ce sujet avait de sérieux troubles cognitifs. Par contre, son discours conversationnel s'est avéré relativement plus cohérent que les autres sujets DTA. Un autre résultat intéressant fut le comportement de la travailleuse sociale. Les différents profils conversationnels qu'elle a adopté en fonction de son partenaire conversationnel démontrent une certaine adaptation au discours incohérent des sujets DTA.

Les résultats sont discutés dans le cadre du modèle de Kintsch et Van Dijk (Kintsch & Van Dijk 1978; Van Dijk & Kintsch 1983). Aucune généralisation ne peut être faite aux populations atteintes de DTA ou aux populations agées normales

étant donné que cette étude n'est que descriptive et qu'il s'agit d'une étude de cas multiples. Néanmoins, quelques hypothèses peuvent être envisagées. La première hypothèse concerne la nature des changements thématiques des sujets. Dans cette étude, les sujets agés normaux semblent avoir une plus grande connaissance des règles pragmatiques de la conversation. Les relations sémantiques entre les propositions sont plus étroites et subtiles que chez les sujets atteint de DTA. Ceci pourrait s'expliquer par une difficulté qu'auraient les sujet DTA à retenir en mémoire le thème précédant afin de rendre le prochain cohérent. La deuxième hypothèse concerne la performance du sujet A1. Son discours relativement normal dans un tableau clinique cognitivement anormal nous force à considérer le rôle que jouent certains facteurs cognitifs dans le discours. La troisième hypothèse a trait à l'adaptation dont a fait preuve la travailleuse sociale. Il est possible qu'une telle adaptation soit présente lorsqu'un locuteur "normal" doit s'engager dans une conversation avec un interlocuteur "anormal" et qu'une telle adaptation ne soit pas réservé qu'aux sujets atteints de DTA. Cette hypothèse pourrait avoir de fortes implications pour le travail clinique auprès de ces populations.

En somme, le présent travail offre un exemple possible de description du discours conversationnel chez une population cérébrolésée, tout en s'inspirant d'un modèle de discours et d'approches pragmatiques. Il offre une description plus détaillée du discours conversationnel des sujets atteints de DTA et permet ainsi de caractériser de façon plus systématique, ce qui se passe au niveau des relations sémantiques entre les propositions.

TABLE OF CONTENTS

Title   Page

Title | Page

Université de Montréal

Conversational Topic Shifting Styles in Dementia of the Alzheimer Type:
A Multiple Case Study

par

Linda J. Garcia

Ecole d'orthophonie et d'audiologie

Faculté de médecine

Thèse présentée à la Faculté des études supérieures
en vue de l'obtention du grade de
Philosophiæ Doctor (Ph.D.)
en sciences cliniques

février, 1991

To all those patients suffering from

Dementia of the Alzheimer Type

and to

Luc and Sophie G. Duchesne

ACKNOWLEDGEMENTS

It is impossible to thank each and every person who has somehow helped me in my dissertation, for such work involves the support of a great many people. To the following people, I would like to extend my most sincere gratitude for having given generously of their time and patience.

First and foremost, I must thank my thesis director, Yves Joanette. Not only has Yves done an excellent job at directing this thesis, but he has earned my utmost respect in allowing me to do this dissertation in a way which suited my needs and my personality. His feedback was always constructive and stimulated my own thought processes. I was encouraged to think rather than have answers simply given to me. As a result, I have grown tremendously. Secondly, I would like to thank my codirector, Jean-Luc Nespoulous. Although the physical distance between our two cities made exchanges difficult during the latter stages, I have always felt that he was there and ready to give me feedback whenever necessary. Jean-Luc has been a real inspiration in helping me pinpoint exactly what I wanted to study within the vast array of pragmatic issues and showed incredible scope in exploring nontraditional avenues.

Marcia Zuker, the social worker who gave generously of her time to converse with each and every subject, was a cornerstone of this dissertation. She has been a strength of support since the beginnings of this project. I would like to thank her most sincerely for giving so unconditionally. Without her, this dissertation would have been nonexistent.

A group of very special people must also be thanked: my subjects. I would like to extend my sincere gratitude to all those subjects who allowed me to come into their homes in order to collect the conversational data and who gave willingly of their time. I extend my gratitude to the families of the patients with Dementia of the Alzheimer Type who trusted and believed in my work enough to take time from their busy schedules for the necessary appointments. In trying to reach these subjects, I would like to thank Dr. J. Willmer and Dr. A. Guzman for allowing me access to patients from the Memory Disorders Clinic at Ottawa General Hospital and to Fran Hadley and her team of the Alzheimer and Related Disorders Unit. Special thanks also go to Allyn Heyes, of the Alzheimer Day Away Program who

made a special effort in locating subjects fitting my criteria and to the Alzheimer Society of Ottawa-Carleton. Jennifer Platt also merits a note of thanks for doing all the audiological testing during her lunch hour.

Data analysis and scoring would not have been possible without the help of Caroline Bredeson and Jane McGarry, both Speech/Language Pathologists. I would like to thank them for being so flexible and generous with their time and for their insightful comments.

A dissertation is not possible without time. For this, I would like to thank my boss, Mr. Michel Bilodeau, for granting me the frequent leaves necessary to complete the work on my dissertation. I would also like to thank all my staff in the Department of Speech/Language Disorders at Ottawa General Hospital for their patience and resourcefulness during my frequent absences.

Finally, in order to survive the emotional strain a dissertation demands, one needs great personal support. I have been fortunate enough to be surrounded by friends and family who have always believed in me. More specifically, I would like to thank my husband, Luc Duchesne, who has never questioned my decision in undertaking this work and who has believed in my potential to succeed right from the beginning. Thanks also go to my daughter, Sophie G. Duchesne, who was born during this dissertation and who probably believes that all families live this way. Without them, completion of the dissertation would have been extremely difficult, if not impossible.

INTRODUCTION

Speech/Language Pathologists are increasingly called upon to make a differential diagnosis of aphasia and language of dementia. The experienced speech/language pathologist will gain a subjective impression that the discourse of the dementia patient is somewhat unusual or incoherent in comparison to the aphasic, despite his high level of fluency. Yet, no available standard aphasia battery is capable of deciphering the subtle differences felt by the experienced clinician.

In order to better understand what is happening in this disordered discourse, the clinician must first gather a good spontaneous sample. In order to provide feedback to families, the clinician must obtain a discourse sample that is representative of what may be occurring outside the clinic and he/she must have the tools to describe the behaviour. Neither of these requirements is easily available both in practice and in the theoretical literature. It is therefore not surprising that speech/language pathologists have difficulty describing what they know to be incoherent discourse.

There are several reasons for the unavailability of information on these issues. First, there is no real measure of incoherence and researchers have much difficulty arriving at a unanimous definition of what it means to be relevant. Secondly, there is a known heterogeneity in brain-damaged populations, in normally aging populations and in addition, in the way in which we all converse. Thirdly, there has been, in the clinical literature, a tendency to approach the analysis of conversation by taking a very global descriptive, checklist approach. The checking off of a particular category in a checklist of pragmatic behaviours gives the clinician no detailed knowledge about the possible processes involved, nor does it offer any detailed information about the interactions between these complex behaviours. There is generally minimal understanding of pragmatic issues because the global approaches are too vague. Lastly, there is a strong tendency amongst researchers to assume that, unless controlled, a conversation can give no valuable operational information.

The present dissertation hopes to offer an example of how one aspect of natural conversational discourse can be described. It hopes to illustrate that understandings of the notions of relevance and incoherence can be inspired by the

theoretical literature on discourse processing and on pragmatic issues. It hopes to illustrate that heterogeneity in conversation can be seen as an asset rather than a liability, since it offers a multitude of situations and examples from which to explore strategies and it is precisely these differences which make conversational analysis so interesting. It hopes to illustrate that it is time to go beyond the checklist approach and take one aspect, namely, topic shifting, and describe it more fully. In this way pragmatic issues can be used to interpret the observable data, just as a conversational partner does in a real conversation. Lastly, it hopes to illustrate that conversations need not be controlled to show patterns, and that, in fact, conversational behaviour is not as random as one would be led to believe.

This dissertation tries to achieve these goals by first reviewing, briefly, the vast literature on the diagnosis of Dementia of the Alzheimer Type. This is followed by an exploration into the literature on communication skills in normal aging and in dementia. Next, there will be a rudimentary review of the very stimulating literature on the notions of pragmatics, relevance and discourse models, in hope of developing an operational, descriptive methodology to study one aspect of discourse, namely topic shifts. A description of the methods and results will follow with a discussion of the results in the last chapter.

CHAPTER 1

DEMENTIA

The term "dementia" with it's implied cognitive deterioration is no longer considered a symptom of normal aging (Damasio and Van Allen 1979), nor is it used to represent a specific disease process (Berg, Hughes, Coben, Danziger, Martin, and Knesevich 1982; Boller, Tomohiko, Roessmann, and Gambetti 1979; Chatelois and Renaseau-Leclerc 1980; Cummings and Benson 1983; Gauthier and Gauthier 1987; Gustafson and Nilsson 1982; Maletta, Pirozzolo, Thompson and Mortimer 1982; Marsden 1978; Mayeux, Stern, Rosen and Leventhal 1981; Ropper 1979; Shore, Overman and Wyatt 1983). It refers to a global impairment of cognitive functioning. Approximately 80% of dementias in patients 65 years or older are a result of Alzheimer's disease or Multi-infarct dementia or both (Gurland 1984) while some 15 to 30% of dementias are of more treatable etiologies, such as low pressure hydrocephalus or metabolic disorders such as hypothyroidism, and vitamin deficiencies (Kushnir 1982).

Alzheimer's Disease per se is an illness which, at the moment, can only be confirmed upon analysis of the histopathological changes (Cummings and Benson 1983; Damasio and Van Allen 1979; Kushnir 1982; Morris, Cole, Banker & Wright 1984; Price 1984). Laboratory investigations of the disease are possible but these cannot lead to a definite diagnosis and are more useful in eliminating the likelihood of other disease processes. Supplementary to the essential blood tests, such investigations may include electroencephalography, evoked potentials, computerized axial tomography, positron emission tomography, magnetic resonance imaging, and regional cerebral blood flow (Cummings and Benson 1983; Gauthier, Robitaille, Quirion, and Leblanc 1986; Gustafson, Hagberg and Ingvar 1978; Hachinski, Potter and Merskey 1987; Hagberg and Ingvar 1976; Heilman and Valenstein 1985; Kaszniak, Garron, Fox, Bergen, and Huckman 1979; McKhann, Drachman, Folstein, Katzman, Price and Stadlan 1984; Pedley and Miller 1983; Ropper 1979; Veroff, Pearlson and Ahn 1982; Wilson, Fox, Huckman, Bacon and Lobick 1982).

The etiology of Alzheimer's Disease is still unknown. Several theories have been put forth. They embrace a genetic predisposition theory, an "infectious agent" theory, a "high level of aluminum" theory, and a reduced neurotransmitter theory (Breitner and Foldstein 1984; Foncin, Salmon, Supino-Viterbo, Feldman, Macchi, Mariotti, Scoppetta, Caruso and Bruni 1985; Gauthier and Gauthier 1987; Gauvreau 1987; Miniszek 1983; Randels 1984; Wurtman 1985).

The trouble in diagnosing this disease in vivo has compelled researchers to consider a "demential syndrome" likely to be a result of Alzheimer's Disease. This "syndrome" has been commonly referred to as Dementia of the Alzheimer Type (DAT). The McKhann et al (1984) paper has been instrumental in suggesting what might constitute possible, probable and definite Alzheimer's Disease.

The clinical diagnosis of DAT is highly dependent on neuropsychological evaluation. Ideally, a full neuropsychological battery should include assessment of language, visuospatial skills, memory, personality, cognition and affective state. There are several existing standardized tests for assessing these functions but the clinician must make an effort to identify the impaired neuropsychological processes rather than pinpointing a clinical diagnostic label, since diagnosis of DAT rests on a global, clinical picture rather than impairment on one subtest in one session.

Miller (1981) recognizes that there exists a shortage of good experiments to study various neuropsychological functions such as memory, visuospatial functions, and distractibility in dementia patients. He stresses the methodological problems with subject selection, experimental design, and the progressive nature of the diseases involved.

Complicating these facts is the increasing evidence of separate subtypes of DAT (Albert 1985; Chui, Teng, Henderson and Moy 1985; Haxby 1985; Joanette, Poissant and Valdois 1989; Mayeux, Stern and Spanton 1985; Morris et al 1984; Seltzer and Sherwin 1983). Subjects are found to have certain cognitive functions proportionately more problematic than others and/or with diverse patterns of

progressive impairment. Although memory problems are cardinal in DAT subjects, language difficulties, or more correctly, communication problems, are reported in the literature as a frequently found impairment in most subtypes of DAT.

CHAPTER 2

COMMUNICATION SKILLS

The conceptual framework used to study language disorders in neurological patient populations has certainly evolved over the years. Historically, the focus rested on the description of **speech** disorders in patients with brain damage. Later, with the advent of syntax, there came a realization that there was an obvious difference between being able to produce the sounds of the language and being able to verbalize ideas into structured sentences and phrases. At this point, investigators directed their attention to what were **language** disorders in patients with aphasia. Since then, a higher level of analysis has surfaced: the existence of text/discourse level processes compounded with pragmatic elements. It has become increasingly evident that there are cortical processes which allow us to formulate our ideas and our structured sentences into a cohesive and coherent whole; processes which allow us to make sense and be appropriate. This skill has been termed **communication**. The present work's main focus is on communication skills.

2.1 COMMUNICATION SKILLS AND NORMAL AGING

Changes in communication resulting from normal aging must be understood before grasping how communication can be affected by a dementing process. For instance, speech perception and visual perception are often decreased in the elderly, especially after age 70 (Pickett, Bergman and Levitt 1979; Robertson-Tchabo 1984). Such peripheral components and the cognitive heterogeneity found in the normal elderly (Valdois, Joanette, Poissant, Ska and Dehaut 1990) can all contribute to an understanding of the communication changes in normal aging and in DAT.

Some authors have commented in a general way on the communication abilities in aged subjects. Meyerson (1976) has suggested that linguistic abilities were not grossly impaired in aging. Critchley (1984) observed that there was a growing dependance of elders on others which was reflected in their language (eg: there might be more requests on their communicator). He also suggested that

"memory lapses" in the normal aged caused effects of repetitiousness and leaving sentences unfinished.

2.1.1. PHONOLOGICAL AND LEXICO-SEMANTIC LEVELS

At the PHONOLOGICAL level, no age-related significant differences have been noted (Emery 1985) and phonological deterioration in normal aging has not been the subject of extensive review. Closer examination of performance at the LEXICO-SEMANTIC level shows that there are some subtle differences. Emery (1985) has found some differences with aging depending on the semantic complexity, redundancy and abstractness. In an animal classification task, Howard (1983) found that the elderly in their 60's and 70's placed more emphasis on the concrete dimension of size rather than the more abstract dimension of predativity as compared to individuals in their 40's and 50's.

In naming studies, Nicholas, Obler, Albert and Goodglass (1985) found the elderly were significantly worse than the younger group on both the naming of nouns and actions with the former yielding a worse performance. Critchley (1984) also noted that the elderly had more word blockages on nouns (especially proper nouns). Goodglass (1980) found that the elderly made primarily semantic errors rather than phonemic errors on naming tasks with more misperceptions and circumlocutions than any other group. Thomas, Fozard, and Waugh (1977) made the same observations.

These preliminary observations led researchers to consider whether aging individuals have increasing difficulty with voluntary access to the lexical network. The hypothesis implies that younger and older subjects have no difficulty with automatic access to the lexical network, but have progressively more problems with voluntary access as he/she ages.

In a priming study, Bowles & Poon (1985) used a lexical decision task and a word retrieval task to explore subjects' ability to retrieve words. The authors found no age differences in the lexical decision task but a significant difference in the

word retrieval task. The older group was slower in every prime condition (i.e. orthographically related, neutral, unrelated,...), although they had a greater vocabulary than the younger group. It was suggested that older subjects were intact in their automatic processing abilities because of their accomplishments on the lexical decision task. Their performance on word retrieval led the authors to suspect a deficit in proceeding from the semantic network to the lexical network. Chiarello, Church and Hoyer (1985) confirmed these results. These age-related priming results have been thought to be a result of delays in semantic activation with aging (Howard, Shaw and Hersey 1986) or with problems in selective attention (Burke, White, and Diaz 1987).

Pouliot (1988) examined the question of a deficit in voluntary cognitive control of word retrieval. Two groups of subjects (young-old - mean 50 years; and old-old - mean 79 years) were asked to do a verbal fluency task using semantic categories (animals, clothes, etc.) and "formal" letter categories (P, M, T, etc.). Subjects were timed and analysis was done on the appropriate or inappropriate responses within the time limit. It was assumed that older subjects would be able to generate more automatic responses during the initial thirty seconds but that afterward, when more voluntary access would be required, older subjects would have progressively more difficulty (Bowles and Poon 1985; Rosen 1980). Pouliot's (1988) results showed a significant interaction between group and criteria. The more aged group produced less words than the younger group, with greater difficulty in the letter category fluency task. The aged group did not, however, have the expected decline in productions in the semantic categories, over time. The results did not support the hypothesis that voluntary cognitive control would affect performance on a lexico-semantic task.

It is very likely that word retrieval is indeed a problem with aging but the nature of this naming disorder and the influence of other factors remains unclear (Ska & Goulet 1989). Ska and Goulet point to several of the weaknesses in the present literature on naming in the normal elderly. On the one hand, it is not completely convincing that studies have seriously considered such factors as the

subject's state of health or the time at which they started having naming problems. In addition, and more importantly, many relevant questions have been neglected by investigators in this field. Ska and Goulet (1989) refer to the models of staging. Word retrieval is not a single stage process, yet there is undoubtedly a paucity of research addressing the nature of the word retrieval deficit in the normal elderly.

2.1.2. SYNTACTIC LEVEL

In terms of SYNTACTIC processing, Hutchinson & Beasley (1976) found that the elderly had little impairment with grammatical inflections. Holtzman, Familitant, Deptula, and Hoyer (1986) found that the elderly were able to use syntactic rules of sentence strings to facilitate word recognition but that they were poorer at this than the younger group. Obler, Fein, Nicholas, and Albert (1985) found deficits in the elderly's capability to comprehend syntactically difficult sentences as did Emery (1985). In fact, Emery (1985) saw a syntactic deficit as being the primary linguistic deficit associated with aging.

2.1.3. DISCOURSE LEVEL

In observations of narrative and procedural DISCOURSE tasks, Obler (1984, 1980) found the elderly displaying more abundant discourse in a more elaborate style. This 'style' was explained as a greater number of words embodied in fewer but more complex sentences. Obler (1980) also noted an increase in indefinite terms (eg: thing, "whatyoumaycallit") as did Critchley (1984). Similarly, one notes more ambiguous referencing with age (Matheson & Edwards 1982; Ulatowska, Hayashi, Cannito and Fleming 1986).

In a typical story recall task, older subjects appear to have greater difficulty recapitulating the gist of a story. Cohen (1979) rated subjects' story recall on number of propositions correctly produced, number of summary propositions (aimed at extracting the gist of the story) and number of modifiers. Both older highly educated subjects and older subjects with lower education were significantly poorer on all three measurements than a younger aged group. Ulatowska, Cannito, Hayashi, and Fleming (1985) and Ulatowska et al (1986) also found older subjects

to have unacceptable summaries of the stories they were asked to recall. Exactly how this was measured is not clear.

Rather than using a story recall task, Cohen (1979) looked at subjects' abilities to answer inferred and factual questions about texts. Old and young subjects differed significantly on their performance with inferred questions but not with factual questions. Hess and Arnould (1986), using another test of inferencing, saw no age differences. Target sentences (half with inferred information; half with explicitly stated information) were embedded in short paragraphs. Subjects were asked to recognize the inferred information in later questions. Contrary to the Cohen (1979) study, this was a recognition task; not a recall task.

Spilich (1983) used an intentional recall and recognition task with 2 narratives. The importance of this study is how the author related the elderlies' performance to the role of working memory. The author had three groups of subjects: one young, one elderly-normal and one elderly-impaired. The reader must be cautioned that there were some serious methodological problems with the subject selection in this study. For instance, the elderly-normal were all institutionalized in a nursing home, yet institutionalization has an effect on certain cognitive functions such as communication (Lubinski 1984). The elderly "impaired" were judged as cognitively impaired based only on scores on the Wechsler Memory Scale. This having been said, the study stimulates discussion on the effects of aging on discourse and its possible relationship to memory functioning.

Subjects were invited to read 2 passages separately, and asked to free recall the text immediately after reading. Following the free recall, they were requested to examine a recognition booklet to determine which sentences were exactly the same as those that had been written in the passage. In free recall, the elderly-impaired recalled less propositions than the elderly-normal and these, in turn, recalled significantly less than the younger group. In looking at the relationship of the propositions to thematic structure, the elderly-normal did not differ significantly from the younger group in recalling information high in the stories' thematic

structure. In other words, for propositions that were extremely important to the story line, younger subjects were not significantly better than the normal elderly.

In the recognition task, the results were identical to recall in that the elderly-impaired recognized significantly fewer sentences than the elderly-normal and the latter, significantly fewer than the young subjects. The error statements chosen by the groups were interesting. The young, when erring, tended to choose statements that preserved the meaning of the sentences. The elderly-normal were also concerned with preserving the meaning but were less careful about syntactic differences. The elderly-impaired group were not accurate on either preserving meaning or syntactic form. The elderly-impaired tended to choose a distractor which frequently is a true statement about the world but not directly related to the theme of the story.

The author gave an interesting discussion of text processing models which might explain some of the results. The young-normal were thought to be using a leading-edge strategy (Kintsch & Van Dijk 1978) for processing text information into a coherent whole, with a buffer capacity of four propositions. The buffer is thought to hold propositions in Working Memory to be later processed in relation to future propositions (Spilich 1983).

The elderly-normal, it was hypothesized, also used a leading-edge strategy, but with a buffer capacity of 2 propositions. This reduced buffer capacity would lead "*to fewer opportunities for the elaboration of and interconnection among idea units in a text*" (Spilich 1983, p. 246).

The elderly-impaired, on the other hand, would be using a random load model; where there would be no systematic organization and retention of propositions. The elderly-impaired data is explained in terms of problems with the loading of Working Memory. The author postulated that either the elderly-impaired could not distinguish the information in Episodic Memory (i.e. what was said in the story) from that in Semantic Memory (i.e. what they know about the world in

general) or that they had intrusions of information from their Semantic and Episodic Memories into their Working Memory as they were processing the text. It is premature to determine whether or not this is indeed what is happening, but the hypotheses are interesting when contemplating the functioning of on-line processing of propositions in discourse such as conversation.

In conversational discourse, Critchley (1984) noted that the elderly may appear incoherent because their memory lapses cause a certain level of repetitiousness and unfinished sentences. Emery (1985) found the normal elderly, as compared to the normal pre-middle aged, to have no problems in using a common code and context when communicating. A common "code" referred to use of the same lexical units, grammatical form and so on. Patients with dementia, in comparison to the normal elderly, were found to have problems with this aspect of the communicative process.

In answering 4 open-ended questions in a conversational style, nursing home elderly referred to key-life figures (eg: family, friends,...) & events (eg: marriage) more than either private home elderly or younger subjects (Matheson & Edwards 1982). Both groups of elderly mentioned vested interests like hobbies more than any other group. Of particular interest to this study, Matheson & Edwards (1982) found nursing home elderly to have a higher frequency of inappropriate interruption of a current topic with a new topic.

Memory for topics of conversation was examined by Kausler and Hakami (1983). These authors had 2 groups of subjects (24 young, 24 old) recall topics of conversation. Half of the subjects were told specifically that they would be asked to recall the topics (intentional recall) and half were not specifically told (incidental recall). There were 12 topics of conversation, each with 2 questions about the topic. After all topics were presented and discussed, subjects were asked to recall as many topics of discussion as possible. Later, they were asked to recognize whether or not a specific question had been asked or not. The results showed a significant effect of age, with younger subjects recalling more topics. This age

effect was particularly significant for primarily presented topics, thereby showing a primacy effect for young subjects but not for older subjects. There were also no significant differences between intentionally and incidently learned material. Likewise, older and younger subjects were not more likely to remember topics about personal facts than about the world in general. Older subjects had more difficulty with recalled topics than with recognized topics, thereby supporting the differences in results obtained in the Cohen (1979) and the Hess and Amould (1986) studies on narrative discourse. One may suggest that older individuals may have greater difficulty in <u>retrieving</u> the information from memory than in <u>storing</u> it per se.

2.1.4. SUMMARY - COMMUNICATION AND NORMAL AGING

In summary, the literature is just beginning to get some consistent results in the research on the effects of aging on communication. At the phonological level, there is a grave paucity of research but no significant problems appear to exist based on the literature so far. Lexico-semantic processing capabilities appear to be dependent on the complexity and abstractness of the items in question and may relate to the level of cognitive automaticity and /or "flexibility" in retrieving information, although more rigorous studies are needed to look at the <u>stages</u> at which word retrieval breaks down. Syntactically, there appears to exist some problems in the encoding/decoding of complex syntactical information and this may or may not be a primary deficit occurring with normal aging. Narrative discourse styles are characterized as elaborate and more abundant with a greater use of vague terms. The elderlies' recall of stories is inferior to that of the young especially in relation to recall of low level thematic propositions. In conversation, the elderly can effectively use the same code and context as their addressee. They tend to talk more about an interest of theirs and have no problems referring to previous topics. Older subjects tend to have greater difficulty <u>recalling</u> topics of conversation than <u>recognizing</u> them, suggesting they may have some problems in retrieving the information from memory rather than storing it. One hypothesis is that their strategies for processing text is the same as for younger subjects but their working memory buffer has a smaller capacity, thereby diminishing the number of chances a proposition is reprocessed.

In short, the aging process may have more of an effect on "communication" than on language. The information that is shared either in discourse or in lexico-semantics may simply represent a different "style" of communication associated with aging or it may, as some researchers postulate, represent some type of cognitive decline and/or lack of flexibility.

2.2. COMMUNICATION SKILLS AND DAT

One of the first papers to note a language problem in dementia patients, was Jules Séglas' book in 1892 (see Obler & Albert 1985). In the monograph entitled *"Des troubles du langage chez les aliénes"*, Séglas referred to *"modifications of speed, intonation, and quantity of language, of syntax and graphic form, and of certain word images and word types"* (Obler & Albert 1985, p.324.). It would seem that Séglas saw difficulties in every area of linguistic processing. More recent literature suggested that dementia does not necessarily affect every level of the semiotic hierarchy but that certain areas, namely lexico-semantics and discourse, are specifically affected. Obler & Albert (1981a) suggest that the type of pragmatic deficits found in dementing individuals may, in fact, be a criteria on which one could distinguish patients with dementia from aphasics. Obler (1983) further suggested that there is not enough known about the nature of these pragmatic problems and that studies should attempt to determine at which level of pragmatics they exhibit the most problems.

The profile of language deterioration in dementia varies from case to case and with level of impairment. There is, nevertheless, some type of communication impairment in all stages of dementia (Obler & Albert 1981b). In fact, Kirshner (1982) reported on literature citing that 5% of 136 hospitalized dementing individuals had a normal ability to communicate. Holland, McBurney, Moossy, and Reinmuth (1985) described a case where syntax was primarily impaired. Whitaker (1976) described one where creative language appeared impaired with more automatic language being spared. Despite these individual differences, researchers generally agree that patients with dementia have impaired lexico-semantics and

pragmatics/discourse with relative sparing of phonology and syntax as compared to normal elderly (Bayles, Kaszniak and Tomoeda 1987; Irigaray 1967, 1973; Obler 1973). Deterioration of language functions will vary with the stage of the disease, with phonological and syntactical aspects being impaired in the later stages (Bayles 1984). Although appearing "aphasic" on test scores (see Section 2.2.1. below), dementing patients can be distinguished from aphasics based on the quality of the responses.

2.2.1. PERFORMANCE OF DEMENTIA SUBJECTS ON APHASIA BATTERIES

The primary concern in initial investigations of language in dementia was to determine these subjects' level of "aphasia" by administering standard aphasia batteries. Results of the Boston Diagnostic Aphasia Examination (Goodglass & Kaplan 1976), yielded poor informational content, poor comprehension, poor naming, and poor writing, with intact repetition in the earlier stages (Cummings, Benson, Hili, and Read 1985; Emery & Emery 1983; Hier, Hagenlocker, and Shindler 1985; Kirshner, Webb, and Kelly 1984; Seltzer & Sherwin 1983; Stein 1982). The test profile of the DAT patient ressembled that of Transcortical Sensory Aphasia or Wernicke-type aphasia (Cummings et al 1985; Hier et al 1985). The same results were obtained using the Western Aphasia Battery (Kertesz 1980). Appell, Kertesz, and Fisman (1982) used the WAB on 25 dementing patients from a psychogeriatric unit, on a stroke group and on normals. Naming and Information Content were the most impaired subtests in the dementia group and their profiles ressembled Transcortical Sensory Aphasia or Wernicke Aphasia. Generative naming was particularly impaired in dementia. Murdoch, Chenery, Wilks, and Boyle (1987) found the same results using the WAB and the NCCEA - Neurosensory Center Comprehensive Examination for Aphasia (Spreen & Benton 1977). Naming, especially fluency naming, was found to be a major problem in dementia as shown on standardized tests (Bayles, Boone, Tomoeda, Slauson, and Kaszniak 1989; Cummings et al 1985; Kirshner et al 1984). The "aphasic" profiles demonstrated on standardized tests was even suggested as indicative of a particular diseases process: namely the difference between DAT and Multi-infarct Dementia (Kontiola, Laaksonen, Sulkava, and Erkinjuntti 1990).

Group studies of such linguistic parameters may lose some of the important individual differences among patients within a particular demential syndrome. In a multilple case study design, using the Montréal-Toulouse Aphasia Battery (Lecours, Rascal, Nespoulous, Joanette, and Puel 1986), Ska, Poissant, Béland, Lecours and Joanette (1990) found subjects to have very different language profiles on a standardized aphasia battery. They stressed the importance in identifying the impaired language components in subjects with DAT since these can be differentially affected. Although the above-mentioned studies converged on the identification of preserved phonology and syntax with impaired semantics, Ska and her colleagues showed that in some cases, there may be clear isolations of each of these components. The remainder of this section will focus on how researchers have begun looking at the quality of responses of these patients to examine their performance at different levels of linguistic processing.

2.2.2. PHONETIC/PHONOLOGICAL LEVEL

Irigaray (1967, 1973) found the phonological code to be intact in degenerative dementia. Other researchers have since supported that these patients perform best at this level of linguistic processing (Appell et al 1982; Emery 1985; Emery & Emery 1983; Murdoch et al 1987). De Ajuriaguerra & Tissot (1975) found that there were phonetic/phonological disturbances as the dementia progressed. Assal, Favre, and Regli (1985) thought there was some evidence of phonetic disintegration in their case of degenerative dementia. Bayles (1984) agreed with de Ajuriaguerra & Tissot (1975) that the phonetic/phonological code appears to resist most the degenerative process, and it is not until the later stages that one notes difficulties in this area. She also postulated that phonology does not require conscious awareness and that this may be one of the reasons why it becomes impaired only in the later stages of the disease.

In sum, the major difficulties with communication skills in dementia do not lie in their phonetic/phonological abilities. The focus of research in communication and dementia, justifiably, has not concentrated in this area.

Nevertheless, there could be a potential interest in the deterioration found in the later stages of the disease.

2.2.3. LEXICO-SEMANTIC LEVEL
2.2.3.1. NAMING STUDIES

Although researchers do not uniformly agree on the nature of the naming deficit in DAT, there is agreement as to the existence of a naming problem (Albert 1980; Assal et al 1985; Bayles 1984; Bayles and Boone 1982; Cummings et al 1985; Irigaray 1973; Morris et al 1984; Seltzer & Sherwin 1983; Whitaker 1976). For instance, Flicker, Ferris, Crook, and Bartus (1987) administered the Boston Naming Test (20 items) to a group of young normals, elderly normals, early DAT and advanced DAT subjects. Confrontation naming was found to be insensitive to normal aging but progressive deterioration occurred with advancing DAT. Bayles and Tomoeda (1983b) looked at 33 normals and 61 demented patients (29 Alzheimer, 11 Huntington, 13 Parkinson, 8 multi-infarct) on a confrontation naming task of 20 colored pictures. Only the Alzheimer patients were found to be significantly poorer than the normals and this was true of the moderately impaired group, not the mildly impaired. Skelton-Robinson and Jones (1984) administered a 73-item test of objects and actions to name, to a group of inpatients with dementia, in order to explore the relationship between naming and cognitive and behavioral measures. Although the authors' choice of test material to measure cognition and behavior can be questioned, the authors found that not only were the patients impaired in naming but that word frequency influenced naming. Barker & Lawson (1968) had also found an influence of word frequency on naming.

Bayles & Tomoeda (1983a) tried to correlate generative naming and confrontation naming tasks to other linguistic measures and found that generative naming (F, A, S) correlated more highly with linguistic measures than confrontation naming. Shuttleworth and Huber (1988) found a significant impairment in the DAT group on confrontation naming. In the fluency naming task, they found a progressive impairment in formal fluency naming but not in category naming. These results did not coincide with Rosen's (1980) previous results reporting a

progressive impairment on <u>both</u> the formal fluency naming (letters C, F, L) and category fluency naming (animals) tasks. These initial results of DAT subjects' performance on confrontation and fluency naming have urged researchers to explore the possible underlying processes which may be defective.

Initially, it was thought a perceptual difficulty was at the origin of the naming problem. Barker & Lawson (1968) controlled for word frequency, whether or not the use of the object was demonstrated, and whether or not the word could be used as noun and verb. The first two of these factors had significant effects in the negative direction for dementing subjects but not for the elderly normals. The authors quickly concluded that in dementia, there were problems in both the object recognition and the word search stages of naming. Rochford (1971) after studying 23 patients on an 8 item naming test, concluded that there was evidence of a perceptual impairment. Kirshner et al (1984), in a later study, divided 40 naming items into 4 levels of perceptual difficulty. The results showed that level of perceptual difficulty was an important determinant of naming performance for the DAT subjects but not for the normal controls. The authors concluded, as did Barker & Lawson (1968) that there were problems with both perceptual and word search stages of naming in these patients.

Bayles and Tomoeda (1983b), also using a naming task, found that 23% of error responses were visually confused only. Martin & Fedio (1983) likewise explored this avenue. Their results showed that every subject produced more language related errors than perceptual errors. The authors concluded that perceptual problems were not at the origin of these patients' naming problems but rather a deterioration of meaning in these words. More recent studies (Chertkow, Bub and Seidenberg 1989; Huff, Corkin, and Growdon 1986; Shuttleworth and Huber 1988; Smith, Murdoch and Chenery 1989) agreed that perceptual difficulties are not the primary reason for the naming problems in these patients.

2.2.3.2. SEMANTIC MEMORY BREAKDOWN

In accessing the name for an object/action or in accessing a series of names in a semantic category, it is generally thought that access must be made to (1) those characteristics (functional, perceptual) that are necessary to label the object or concept and (2) the core semantic concept itself (Chertkow, Bub and Caplan 1987). In DAT, some authors have postulated a breakdown in the semantic structure itself (Huff, Mack, Mahlmann, and Greenberg 1988) while others believe the problem is more one of access (Nebes, Martin and Horn 1984) to the information. The results of these and other priming studies (Albert and Milberg 1989) raise the question as to whether there is a distinction in DAT between access to information which is done automatically versus voluntarily.

It is not enough to simply state that these patients have naming difficulties. Analysis of raw scores may not differentiate a DAT patient from a normal (Bayles & Boone 1982) or from the depressed or psychiatric patient (Stein 1982). Patients affected by DAT may have no problems with accessing the formal lexical form of an item (Bayles 1984; Chertkow et al 1989; Emery 1985; Nebes & Boller 1987) but have problems accessing the semantic structure. For this reason, error analysis has proven much more fruitful in response to the question of intact or impaired semantic memory in these patients.

Originally, it was assumed that DAT patients had some type of semantic impairment (Appell et al 1982; Bayles 1982; Murdoch, Chenery, Wilks and Boyle 1987). Emery & Emery (1983) found that the more the task became semantic in nature, the bigger the difficulty in patients with dementia. Bayles & Boone (1982) found their semantic correction test to be the most sensitive in identifying dementia.

Ober, Dronkers, Koss, Delis, and Friedland (1986) examined the errors of letter fluency and category fluency naming in patients with DAT. DAT patients gave the expected result of fewer responses the more severe the dementia. The

Moderate-Severe DAT subjects had less clustering with the subcategories and fewer items per category in relation to the milder DAT subjects. The authors concluded that cognitive decline in these patients correlated with semantic retrieval performance. Item to item loss of information have led authors to believe that there is, in fact, a loss of semantic information per se in the semantic memory of DAT patients. For instance, Huff et al (1986) found that if DAT subjects made a semantic error in a name recognition task, the words were less likely to be accessed for naming purposes. Chertkow et al (1989) later supported these results in an item to item loss on picture naming and word/picture matching. The question remained as to whether the information was totally lost or simply degraded in nature.

In a small scale study, Desmarais and Joanette (1988) compared subjects' levels of item productivity to normals' performance and examined subjects' semantic clustering abilities within a given semantic category. All DAT subjects produced what was termed a higher proportion of 'nonacceptable responses'. Protypicality scores (ie: how prototypical of the semantic category was the item) were similar to the normals, suggesting that at least at the automatic level, these patients could access an intact semantic memory. Clustering analysis showed that DAT subjects had a decreased amount of clusters, as compared to the normals. The implication of this was that either patients had difficulty accessing Semantic Memory voluntarily or, at a detailed level, semantic content was beginning to deteriorate, not yet affecting the more global semantic categories. In the Huff et al (1986) study, DAT subjects were able to recognize category names for pictured objects but were impaired in the names for specific objects within the category, supporting a possible degradation of information.

The structure of semantic information in a category fluency naming task (supermarket task) was further analyzed in a more recent study (Troster, Salmon, McCullough, and Butters 1989). DAT subjects sampled fewer categories than the controls and they had a lower number of items per category sampled. This finding was also significant in comparing the mild and the moderately impaired DAT

subject groups. The authors concluded that there may be a bottom-up deterioration of *"the hierarchical structure of semantic knowledge in DAT"* (p.510).

Smith et al (1989) did an error analysis of responses given on a visual naming task and a tactile naming task. They suggested that one of the reasons why DAT subjects made more semantically related errors was that they had lost some of the salient semantic attributes which distinguish one item from another in a specific semantic category. Chertkow et al (1989), using a priming design, examined subjects' response to associatively related words (eg: hammer-nail) versus semantically related words (eg: hammer-wrench) versus words that were unrelated. DAT subjects were slower in responding to words that had a degraded semantic representation.

2.2.3.3. ACCESS TO SEMANTIC MEMORY

The question of the intactness of semantic memory in these patients is far from being resolved. Although many researchers support the theory of some impairment in semantic memory, some suggest that in certain DAT patients, the problem may be one of access to the information rather than a problem with the information itself. Nebes et al (1984) did a three part priming study to examine this question. Although DAT subjects had decreased episodic memories and decreased fluency naming based on a previous battery of cognitive tests, they showed no significant difference from the matched controls on the semantic priming test. They were inferior to the normals, however, on the incidental learning task. In short, DAT subjects showed some intact semantic information organization based on their semantic priming performance. The result of intact priming in a paradigm using semantically related and unrelated primes was repeated in the Albert and Milberg (1989) study. DAT subjects showed a difference between related and unrelated words suggesting at least some intactness at the level of semantic memory.

Flicker et al's (1987) DAT subjects showed the expected impairment in confrontation naming but early DAT subjects could identify an object after presentation of its label. DAT subjects did not perform significantly differently

from the elderly normals in identifying what an object was used for and in then selecting the name for the object from a list of words. Although this would support an intact semantic memory theory, it was also shown that if a subject could not spontaneously produce the name of the object, the early DAT were also usually unable to recognize its name or describe its function; suggesting a deficit in the semantic information per se.

In comparing DAT subjects to patients who had had cerebro-vascular accidents (CVA), Huff et al (1988) found the two groups to perform similarly in a naming to definition task (eg: A tool to pound nails is called a _____) and a regular object naming task chosen from 6 semantic categories. DAT responses were, however, more consistent. Subjects then underwent a semantic discrimination test where they had to match a picture of an object to a definition and match a picture of an object to a pantomime of its use. It was hypothesized that CVA patients would show an access problem with the verbal portion, without impairment on the nonverbal portion, whereas DAT patients would show deficits in both. There was a group effect on the Pantomime Recognition Test but not on the Semantic Discrimination Test. It was concluded that, although DAT and CVA patients showed impairment in both access to information and in the structure of the information itself, loss of information may be more prominent in the DAT subjects. The dilemma of whether DAT subjects have a semantic access or a semantic information deficit was again demonstrated in a study by Diesfeldt (1989). Results showed DAT subjects to be significantly poorer on the Dutch Aphasia Test Battery and in picture identification with same semantic category foils (SC). Those items with foils from differing semantic categories (MC), did not pose a problem for the DAT, suggesting at least some intactness of semantic knowledge. Also supporting the access problem theory was the inconsistency of the responses. That is, the performance on the picture identification task and the naming task were not item-specific. The impaired performance in the Semantic Category foil condition, however, did suggest at least some deterioration in semantic organization.

2.2.3.4. AUTOMATIC VS CONTROLLED ACCESS TO SEMANTIC MEMORY

The results of certain priming studies with DAT subjects has led some researchers to consider whether or not the semantic information is there but only accessible on an automatic basis (Flicker et al 1987; Smith et al 1989). Ober et al (1986) suggested that DAT patients may have controlled access problems related to attentional difficulties. Their subjects' performance on a fluency naming task correlated with decreased performance on tasks requiring attention, learning, naming or language comprehension. Exploring the attentional question a little further, Nebes, Brady, and Jackson (1989) found no support for this theory. Chertkow et al (1989) have found impairments in both automatic and effortful tasks. Priming, as a research paradigm, has yielded quite different results with varying populations of DAT subjects (Albert & Milberg 1989; Chertkow et al 1989) and to make a statement on the controlled vs automatic access to semantic memory based on these data is still a bit premature.

2.2.3.5. SUMMARY - LEXICO-SEMANTIC LEVEL

In summary, DAT subjects appear to have clear confrontation naming and fluency naming problems. The process responsible for this lexico-semantic difficulty is not clear. Difficulty in perceiving the stimulus item may play a role in certain patients but it is unlikely that it is the primary reason for the impairment in naming. It is possible, based on the research so far, that DAT patients have some semantic information intact with a degradation of the detailed information distinguishing items from a specific semantic category. In short, the semantic problem in DAT rests in the information that is stored in Semantic Memory or in the access to this information.

2.2.4. SYNTACTIC LEVEL

Despite an undisputed deficit at the lexico-semantic level of linguistic processing, DAT patients appear sensitive to the grammatical class of words (Smith et al 1989). In a word association task, for instance, Gewirth, Shindler and Hier (1984) found dementing patients performed normally. As normal controls, they

produced more paradigmatic responses (eg: shoes -feet) than syntagmatic responses (eg: sit - down) to noun stimuli. In Schwartz, Marin, and Saffran's case study (1979), their patient, although showing evidence of difficulty in differentiating certain semantic categories, had no difficulties when asked to do a syntactic task. The authors claimed there to be a dissociation between semantics and syntax in these patients. Schwartz et al (1979) concluded about their case that she had some knowledge of word meaning but was also sensitive to the syntactic category of the lexical item. Other authors have also postulated that syntax was relatively preserved in dementia (Appell et al 1982, Murdoch, Chenery, Wilks, and Boyle 1982).

Based on a Test of Syntactic Complexity, Chomsky's Test of Syntax, and The Token Test, Emery (1985) found dementing patients to be totally unable to process syntactic information. One of their tests, "*The Test for Syntactic Complexity*", appeared to be heavily weighted for semantics. An example of a test question for determinining time sequence was "*What season comes before Spring and after Autumn? (p.18)*"; for comprehension of possessive relationships, "*Suppose I point to someone across the street and say, "That person is my husband's sister", Whom am I looking at? What is the relationship of that person to me? (p.18)*". Emery (1985), as well as de Ajuriaguerra & Tissot (1975), were of the opinion that patients with demential syndrome regress to the use of more elementary forms of syntactic patterning and that this pattern of dissolution is the reversed process of syntactic acquisition in the child. No other support has been found for this theory.

In the hope of exploring dementing subjects' use of syntactic information to facilitate sentence recall, Nebes et al (1989) showed subjects groups of seven words, some of which formed bizarre or semantically anomalous sentences. Subjects read each of the singly presented words within each of the groups of seven words, were given an interference task after the last word and then asked to recall the words back. There were 25 groups of words forming 'sentences': 5 were 'normal' (eg: "*Five girls swam in the shallow pool*"), 5 were 'bizarre' in that they had normal surface structure but bizarre content (eg: "*Three bugs jumped over the rotten meat*"), 5 were 'semantically anomalous' (eg: "*Many carrots sang to the sickly*

ashtray"), 5 were sentence 'anagrams' (eg: "*Ship near sunken two floated ducks the*") and 5 were 'word lists' (eg: "*Dentist town a the decided tender broken*"). It was hypothesized that DAT patients would have more difficulty when the syntactic structure was aberrant since they would then have to rely soley on semantic information to process the sentence. Results showed no significant differences between DAT and normal controls except on the 'semantically anomalous' sentences, where the normal elderly performed worse that the DAT subjects. Qualitatively, it appears that the more likely a syntactic pattern will have an effect on meaning, the more chance it has to be impaired in dementia (Irigaray 1973; Schwartz et al 1974).

2.2.5. DISCOURSE LEVEL

The study of DAT subjects' communication abilities beyond the sentence or the study of their <u>use</u> of language (pragmatics) remains in its embryonic stage. Initially, the literature reported researchers' general observations of these patients' communicative abilities. Irigaray (1967) described demented patients as being "incoherent" with an absence of 'real control' over their utterances. Bayles (1984) spoke of fewer perlocutionary acts and less diversity in illocutionary acts. De Ajuriaguerra & Tissot (1975) noted that terms implicit in the situation were omitted. Ernst, Dalby, and Dalby (1970) noted a "lack of language initiative". Ledoux, Blum and Hirst (1983) found that patients could not appreciate the constraints on the plausibility of sentences.

Shindler, Caplan, and Hier (1984) found subjects with DAT to have a higher incidence of intrusions in a battery of behavioral tests. Subjects would be more inclined to inappropriately repeat previous test responses although the stimuli had changed. Fuld, Katzman, Davies and Terry (1982) suggested that these intrusions were a clinical sign of Alzheimer's Disease. In a later study, Bayles, Tomoeda, Kaszniak, Stein and Eagans (1985) found an increase in ideational perseveration in DAT subjects as compared to normal elderly. Obler (1979) and Obler and Albert (1981) found patients with dementia to have little communicative intent and to repeat material more often. They suggested that pragmatics of language can be

used to distinguish dementing individuals from aphasics. Whatever the findings of the pragmatic deficits in dementia, clearly this area of study is in dire need of research. The increased attention to discourse analysis in linguistics has allowed researchers to go beyond the anecdotal observations and into a more systematic analysis of these patients' communicative abilities.

2.2.5.1. NARRATIVE/PROCEDURAL DISCOURSE

Narrative discourse tasks (such as describing a well known story, retelling a story or telling a story based on a series of pictures) as well as procedural discourse tasks (eg: all the steps needed in order to perform a specific task) are often used in dementia studies but few authors give systematic analyses of these discourses. In standardized tests, using open ended questions, several researchers have found dementing individuals to be poor in their information content (Appell et al 1982; Cummings et al 1985; Stein 1982). Obler (1980) looked at written narrative discourse and found demented patients to have more indefinite terms and a greater number of additions of information.

In a later study (1982), Obler, Albert, Helm-Estabrooks and Nicholas compared 15 Alzheimer's, 15 Wernicke aphasics and 40 normal subjects on a picture description task ("Cookie Theft" picture of the Boston Diagnostic Aphasia Examination). They found Alzheimer subjects to have more logical conjunctions and more comments than the other two groups. Wernicke aphasic subjects, in contrast, had significantly more verbal paraphasias and neologisms. Obler (1984) reported that the narrative discourse of demented patients could be characterized by more total words, more words per theme, more commentary and more judgement statements (eg: unfortunately....).

Shekim & Lapointe (1984) studied narrative (picture sequences, memorable story), expository (picture description) and procedural discourse in 9 normal and 9 DAT subjects. Discourse was analyzed in terms of four measures: basic measures of duration, number of syllables, number of words, number of 'communication units' and number of 'maze words', cohesive measures such as referencing, substitution,

ellipsis, conjunction, and lexical cohesion, and other more sophisticated measures called performance measures and derivative measures. In terms of cohesion, DAT patients used all cohesive ties but to a lesser degree than the control group. Referencing was present but the referent was not always clear. Exophoric referencing was frequent in the DAT subjects. In terms of performance measures, the DAT subjects had more frequent incomplete utterances, stops and revisions, filler words and long pauses. DAT subjects were also found to have a significantly slower rate of speech and a significantly higher percentage of 'maze words'. These were defined as a series of words that did not constitute a "communication unit" which was any independent clause plus its dependent modifiers.

Counting the number of indefinite terms and the like is very limited in the information it gives regarding discourse. Indeed, these analyses do not constitute discourse level processing analyses just because the data used goes beyond the sentence. The use of current discourse level processing models is practically nonexistent in any of these studies and even worse in the analysis of conversational discourse. Kahn, Joanette, Ska and Goulet (1990) pointed to the shortcomings of discourse studies in neuropsychology. They referred to a paper written by Chapman and Ulatowska on aphasics, but the same can be said of the discourse studies done with DAT subjects. For example, there is no consideration of other nonlinguistic factors such as memory, yet clearly, discourse has a strong mnesic component.

2.2.5.2. CONVERSATIONAL DISCOURSE

The status of conversational discourse analyses of dementia subjects is even poorer than that of narrative discourse analyses. Although conversational discourse is an ideal situation to observe discursive skills, it is far from being easily operational in a research design or in trying to conceptualize a theoretical framework for conversational behavior. Reported general comments of dementing individuals' performance in conversation were increased repetitiousness (Critchley 1984; de Ajuriaguerra & Tissot 1975) and poor informational content (Cummings et al 1985), while maintaining a normal response to automatic social remarks like "good morning" (Stevens 1985).

In her Ph.D. dissertation, Campbell-Taylor (1984) looked at what professionals and non-professionals identified as being unusual in the conversations of a DAT patient and an examiner. The more prominent categories selected by both groups reflected a pragmatic deficit. Dementing patients were found to make inappropriate topic shifts, have disordered eye gaze, and abnormal content in their conversations. Ripich, Terrell, and Spinelli (1983) found their case of dementia to use structural cohesive ties but the semantics of the discourse was unrelated. In a later study (1988), Ripich & Terrell looked at cohesion and coherence during topic directed interviews using a few more subjects with DAT and normal elderly subjects. Results showed that DAT patients used more than twice as many words and more than 4 times as many turns as the normal controls. Interestingly, the interviewers also altered their communication pattern so that they too produced more words and turns than when speaking to the normal elderly. DAT subjects were less impaired in their structural cohesion than in what the authors called 'semantic cohesion'. Absence of a referent was the most frequent cohesive error in DAT. As reported in previous studies cited above, information errors were the most frequent type of errors associated with incoherence. None of the normal elderly were labeled as incoherent.

> *"Although the elderly comparison group may have lacked some features of well formedness in their discourse, listeners generally found their speech coherent. However, the listeners experienced an inability to follow the flow of discourse in each of the DAT subjects"* (Ripich & Terrell 1988, p 14)

Illes (1986, 1989) also looked at the conversational skills of patients with dementia. Subjects were interviewed in a sound treated room and asked to respond to questions about various personal topics. She found the patterns of spontaneous language in patients with Alzheimer's Disease, Huntington's Disease and Parkinson's Disease to be significantly different from each other and from normal elderly language. More specifically, she found a significant increase in the number of long silent hesitations, a significant increase in the number of self corrections and a significant increase in the number of aborted phrases in patients with Alzheimer's

Disease. She also found that unlike DAT patients, Parkinson Disease and Huntington Disease patients had a 'press for speech'. She hypothesized that these patients spoke quickly so as to not forget an ongoing topic. In DAT, they did not exhibit this press for speech. Illes suggested that perhaps DAT patients are not aware of their Short Term Memory deficit and do not therefore try to cope with it by speaking quickly in order to not forget the topic.

Hutchinson and Jensen (1980) compared five dementing elderly females to five normal elderly females in a nursing home for an evaluation of their conversational discourse skills. They found the dementing individuals to have more turns and fewer utterances per turn which suggested that they did not elaborate their topic. The experimental group also made extensive presuppositions regarding shared knowledge. They initiated new topics more, violated rules of continuation of one's own topic and partner's topic.

> *"The senile elderly frequently introduced new topics in the absence of appropriate closings of previous topics".* (p 69)

Emery (1985) also addressed this issue, but in more general pragmatic terms. In looking at the conversational skills of DAT subjects as compared to normally aging subjects, she found that "...*many of the SDAT [Senile Dementia of the Alzheimer Type] subjects showed neither equivalence in code nor commonality in context* (p.48)", with equivalence in code remaining intact longer. In order to facilitate communication and ensure that the addressee understands the message, a speaker must use a code which is equivalent to both communicators. For example, they must both know the rules for word order in that code. In addition, the speaker must refer to a common context. Emery (1985) found the normal elderly to use a common code and context in contrast to the DAT subjects.

The process of deterioration of pragmatic skills in dementia is far from being understood. Future directions should encourage the description of conversational behavior more specifically so as to discover semiotic hierarchies of pragmatics (Obler 1983). In a recent paper, Ripich, Vertes, Whitehouse and Fulton (1988)

presented a study which makes some effort in determining some of the processes involved in DAT conversations. They involved 11 normal elderly and 11 DAT subjects in a 9 minute unstructured conversation which had been disguised as a coffee break from regular clinic testing. Conversations were transcribed and analyzed according to Dore's classification of speech acts (1979). Conversations were between the examiner and either a DAT subject or a normal elderly. All tapings were done in the clinic. Results showed that the normal elderly used more words per turn, did more assertions and made more responses to choice questions. The DAT used more process questions. The examiner made more requests with the normal elderly, asked more process questions and used more descriptions. In conversation with the DAT subjects, the examiner used more words per turn, more action requests and asked more clarification questions. The authors do not make any significant interpretations of the data in terms of communication theory and dementia but the results do suggest that one may, in fact, identify different communicative processes/styles in conversations with patients with dementia as compared to the normal elderly.

As with narrative discourse studies, these investigators failed to plan their studies in relation to models of discourse processing. The only study which tried to integrate pragmatic theory into their analyses was the Ripich et al (1988) study and this was limited to a checklist format, so common in child language studies of the late 1970's (Bloom and Lahey 1978). Again, no consideration of the subjects' mnesic skills was made nor was any attempt made at explaining the results in terms of discourse processing models.

2.2.5.3. MEMORY DEFICITS AND DAT DISCOURSE

Memory cannot be ignored when studying high level communication skills such as discourse. Functionally, it is obvious that if a converser wishes to maintain a coherent conversation, he/she must be able to retain in memory what has just been said. This section will give a rough synopsis of the impaired memory systems in DAT so that the discourse problems just reviewed may be better understood.

2.2.5.3.1. Primary Memory

To speak of a 'memory' problem is meaningless since memory is believed to comprise several components (Baddeley 1976; Baddeley 1986; Craik & Lockhart 1972; Tulving 1972). In current models, **primary memory** is the memory in which information is stored for relatively short periods of time before it undergoes more processing. Few people have attempted to describe the primary memory deficits in patients with DAT. In a review of this literature, Morris and Kopelman (1986) have concluded that these patients would appear to have some problem with primary memory. Evidence of this would come from memory span results, the recency effect during free recall in these patients and their performance on the Brown-Peterson test (Brown 1958; Peterson & Peterson 1959).

Working Memory

"implies a system for the temporary holding and manipulation of information during the performance of a range of cognitive tasks such as comprehension, learning, and reasoning" (Baddeley 1986, pp 33 - 34).

From this definition, it is clear that a deficit in Working Memory could have strong repercussions on discourse level processes. Discourse models suggest that propositions are held in working memory for further processing (see section 3.5.2.3.).

According to Baddeley (1986) there would be 3 basic components to working memory: the articulatory loop, the visuospatial scratchpad, and the central executive system. The articulatory loop is a subsystem of Working Memory controlled by the central executive system. It allows for articulatory rehearsal and the creation of a passive phonological store, thereby making less demands on the central processor.

Phonological similarity appears to have the same reduced effect on immediate recall in DAT patients as in normals (Morris 1984). This would suggest that DAT patients have an intact passive phonological store. In Morris' (1984) study, DAT and normals showed similar word length effects in recall, suggesting that their

articulatory rehearsal mechanism was functioning. In short, it was hypothesized that patients with DAT have no problems with the articulatory loop subsystem of working memory (Baddeley 1986; Morris & Kopelman 1986; Van der Linden 1988).

The visuospatial scratchpad is the nonverbal equivalent to the articulatory loop. It allows rehearsal of visual patterns held in memory and allows the creation of a passive visual store. This system is minimally significant for the processing of conversational discourse and will not be examined further. Moreover, Morris & Kopelman (1986) stated that the possible deficits in the visuospatial scratchpad in DAT have not received extensive investigation.

Both the articulatory loop and the visuospatial scratchpad are systems subserved by a central executive. This last component of working memory is by far the most complicated of the three and the most important. Baddeley (1986) envisioned the central executive as both a 'ragbag' and a 'supervisor'. In the first sense of the word, it includes the conceptual store of processes not directly related to the articulatory or visual systems. In the second sense of the word, it implies a superior system capable "*of selecting strategies and integrating information from several different sources*" (Baddeley 1986, p. 225). The central executive has limited storage capacity but it is thought to coordinate and plan. Therefore, doing two tasks at the same time, such as the Brown-Peterson test, would be difficult if your central executive was malfunctioning. If one extrapolates, processing pragmatic information would also be difficult since pragmatic material needs to be inferred from different sources (see section 3.2.).

Exploration of a deficit with the central executive system in patients with DAT is still ongoing (Baddeley 1986). It is hypothesized that these patients may have a reduced pool of processing resources in the central executive (Morris & Kopelman 1986, Van der Linden 1988). The more demands that are put on this system, the less the patient is thought to be able to coordinate and plan the processing of the information.

In summary, there appears to be a deficit in DAT patients' working memory, but not all aspects. The central executive system appears to be the most impaired. In addition, a relation appears to exist between this impairment and the severity of the dementia.

2.2.5.3.2. Secondary Memory

In contrast to primary memory, **secondary memory** allows one to store information for longer periods of time. This memory has been subdivided into episodic versus semantic memories, and implicit versus explicit memory.

Tulving (1972) described episodic memory as:

> "*a system that receives and stores information about temporally dated episodes or events, and temporal-spatial relations among them*" (Tulving 1984, p. 223)

Semantic memory, in contrast, is:

> "*the memory necessary for the use of language. It is a mental thesaurus, organized knowledge a person possesses about words and other verbal symbols, their meaning and referents, about relations among them, and about rules, formulas, and algorithms for the manipulation of the symbols, concepts, and relations*" (quoted in Tulving 1984, p 223).

Tulving (1984) does not deny the close association between these two types of memory yet he sees them as being capable of functioning entirely independently from one another.

The majority of classical memory tests given in neuropsychology, examine what would be considered episodic memory (eg: to remember a list of given words). Episodic memory is closely linked to context, whereas Semantic memory is not. For instance, a subject would need his episodic memory to tell you what he had had for breakfast but he would also need his semantic memory to remember what he usually has for breakfast (Van Der Linden 1988).

In conversational discourse, Episodic Memory information would allow the sharing of anecdotal information. Likewise, Semantic Memory is clearly paramount

in language processing as well, since its very definition relies on linguistic information. For instance, the establishment of meaning relationships is part of the Semantic Memory definition. It is needless to say that these relationships are absolutely necessary for processing coherent discourse.

The ability to use semantic information to help remember episodic information is apparently at fault in DAT patients, according to Morris & Kopelman's (1986) review of the literature. As a result, these patients not only have problems in organizing the material but also have problems in using semantic information to help encode and retrieve episodic information.

The nature of this deficit can be viewed as a difficulty with the consolidation of the information in Episodic Memory and/or as a result of difficulties with Semantic Memory. There does not appear to be much argument as to the existence of an episodic memory problem in DAT, although the exact nature of this deficit is being explored.

Most studies exploring the "intactness" of **Semantic Memory** in DAT use language tasks as the basis to their investigation. The majority of tasks involve semantic priming, word list generation, and picture naming/classification. These results have been reviewed in a previous section (see section 2.2.3.).

As with episodic/semantic memories, implicit/explicit memories are best described in opposition to each other. Implicit memory is involved for the recollection of material that was not explicitly requested. Information usually shared in conversational discourse is implicitly provided. Explicit memory is the memory usually required in standard memory tests where the subject is consciously asked to remember specific information. Implicit memory is necessary to remember other information learned by chance. In daily life, information is not usually learned or remembered consciously and often requires an intact implicit memory. For this reason, researchers have become increasingly interested in the functioning of these

types of memories (Schacter 1987). The exploration of the involvement of explicit/implicit memories in DAT patients is still embryonic.

Morris & Kopelman's (1986) review suggested that implicit memory is preserved in DAT due to their normal semantic priming results (Nebes 1985; Nebes, Boller and Holland 1986; Nebes et al 1984) and their similarity to the performance of amnesic patients (Graf & Schacter 1985).

Explicit memory involves conscious recollection of material; it is not an automatic activation process. In this area, DAT patients are known to have problems. The questions still asked regard the stage at which the process is problematic: the acquistion of material, the retention or the retrieval? The strategies utilized by these patients for encoding and retrieving information need to be explored. Van der Linden (1988), in reviewing the literature, found a paucity of research specifically addressing the issues of processing phases in implicit/explicit memories in DAT.

2.2.5.3.3. Summary - Role of Memory

In conclusion, to speak of "memory" problems in dementia is noninformative. At present, researchers have identified a problem of Primary Memory in patients with DAT, as evidenced by their performance on tests such as digit span and the Brown-Peterson test. Within Working Memory, these patients appear to have an intact articulatory loop but a defective central executive system. One may hypothesize, then, that holding discourse propositions in memory while waiting for further processing would be difficult for these subjects.

Patients with DAT also seem to experience problems with Secondary Memory. Researchers who believe in the episodic/semantic memory distinction appear to agree on a deficit with Episodic Memory but are still debating on the existence of a Semantic Memory deficit. Extrapolating to discourse, DAT subjects would have difficulties or exhibit incoherence in the retelling of anecdotes and the like. As was seen at the word level, controversy exists as to whether there is a

problem with the **structure** of semantic memory or with the **access** to this memory. Lastly, patient subjects' performance on semantic priming tasks has led some researchers to believe that implicit memory was relatively intact in patients with DAT. Explicit memory, on the other hand, is a problem, but researchers have not yet identified if the problem lies with the acquisition, retention or retrieval stages of explicit memory. Explicit memory tasks, one would assume, rarely occur in natural conversation.

2.2.5.4. SUMMARY - DISCOURSE

In short, there is clearly a deficit in the discourse of DAT patients, although the nature of the deficit is still not fully understood. Preliminary research showed that DAT patients used structural cohesive ties but had disordered referencing, an increased amount of indefinite terms and comments, and a higher percentage of incomplete utterances. Examination of conversational discourse showed abnormal semantic content, inappropriate topic shifts and maintenance of topic, more aborted phrases, hesitations and more turns. Some of these observations may be explainable by the memory deficits found in DAT subjects. Namely, deficits in the central executive of working memory, episodic memory, and perhaps semantic memory.

2.2.6. SUMMARY - COMMUNICATIVE SKILLS AND DEMENTIA

The communication problems seen in dementia are clearly different from those seen in "aphasic" individuals. Dementia, although resulting in different clinical profiles, as in aphasia, seems to primarily affect the lexico-semantic and the pragmatic/discourse levels of the semiotic hierarchy. Lexico-semantic disturbance manifests itself through undisputed problems in confrontation and fluency naming. Performance on these tasks may be related to a progressive, bottom-up deterioration of semantic information itself or to a difficulty with the access to this information. There is an ever increasing amount of literature addressing these issues.

Close examination of the pragmatic/discourse problem is still immature due to lack of research in this area, possibly as a result of the inherent methodological problems and the lack of a theoretical framework. Studies so far have limited

themselves to almost anecdotal descriptions of conversations or to a global checklist format of pragmatic behaviors. None have considered discourse level processing models, nor have they hypothesized how the evident memory difficulties in these patients might affect their discursive skills. Although challenging, research directed at a specific area of pragmatics/discourse may prove useful in understanding how these patients are unable to form a coherent discourse at the same time as forming perfectly syntactical sentences.

CHAPTER 3

TOWARDS THE ANALYSIS OF CONVERSATION

3.1. CONVERSATION: A COMPLEX ORGANIZED DISCOURSE

Although it may be foolish to assume that one can develop a full comprehensive model of conversation which takes into account all factors (Kintsch 1988), conversation is far from disorganized. Everyone can distinguish the difference between a coherent relevant conversation and a set of unrelated sentences.

At first glance, it is the maintenance of conversational topics which seems to keep the conversation together. It is the process of contributing new information and 'grounding' it so that both speaker and hearer can agree as to what was meant and what was said (Clark & Schaefer 1987). To do this, speaker-hearer pairs must attend to the *"formulation, maintenance and shifting of topics"* (Crow 1983, p.137) so that conversational interactions are not random and can be perceived as coherent.

Although the structural aspects of openings, closings, turn taking, pauses, and timing (Feldstein & Welkowitz 1978; Kraut & Higgins 1984; Sacks, Schegloff, & Jefferson 1974; Wardhaugh 1985) are very interesting, the most challenging area in conversational discourse analysis is the examination of how the 'body' of conversation is realized; how participants exchange information. Instrumental in the understanding of conversation was the development of the field of study known as "pragmatics" (MacWhinney et al 1982). The remainder of this section will explore the notion of pragmatics, its contribution to meaning relationships, the role of context, and the role of speech acts. Subsequent sections will explore the intital attempts at characterizing conversational discourse with a particular focus on the notion of relevance. Lastly, the importance of topic shifts in conversation will be examined and existing discourse models summarized. It is hoped that through this, one will be able to logically see the choice of topic shifting style as an initial area of study within the conversational discourse of DAT subjects.

3.2. PRAGMATICS

3.2.1. PHILOSOPHICAL ORIGINS

Before becoming an area of linguistic study, pragmatics was rooted in philosophy and to this day, the 'mandate' of this field of study is still unclear to some researchers. Charles Morris, a philosopher, was the first to introduce the term 'pragmatics' as it is used today (Levinson 1984). Several schools of thought have since followed, but one of the most popular is the Anglo-American school, beginning with Austin (1962).

Searle (1965, 1969, 1975), one of Austin's students who systematized Austinian theory, said that pragmatics is fundamentally concerned with the philosophy of language. It is only incidentally considered with a particular language and does not, unlike other areas of linguistics, attempt to describe specific structures. Pragmatics is concerned with how we use our language rather than the structures that are inherent to it.

The most innovative notion introduced by Austin (1962) and followed by Searle (1965, 1969, 1975) was the notion of **speech acts**. These authors believed the speech act to be at the core of linguistic communication. It is *"the production or issuance of a sentence token under certain conditions"* (Searle 1969, p.16). The words *"production or issuance"* imply that the utterance is indeed an act generated by a user. The words *"certain conditions"* imply that this act is rule-governed. The 'speech act' includes several different types of acts: utterance acts (sentence meaning irrespective of speaker), propositional acts (what the speaker means; includes referencing), illocutionary acts (intended meaning by speaker) and perlocutionary acts (effect of meaning on hearer). The major 'force' behind the speech act is the illocutionary force. It describes the relationship between 'doing' (intention; the notion of 'act') and 'saying' (utterance). For instance, one can perform the act of persuasion by realizing it through a particular utterance. Berrendonner (1981) was uncomfortable with this notion of 'doing' for he stated that one cannot always 'do' what one says. Sometimes the act may not be possible

to perform, or be too long to execute which means that the relationship between illocutionary force and perlocutionary effect does not always follow. In other words, although one intends to persuade, it does not always follow that the hearer will be persuaded. In his opinion, 'saying' may replace 'doing' in these circumstances and speech is not an <u>act</u> at all.

Berrendonner (1981) appeared to have interpreted the notion of 'act' quite literally. The notion of 'act' emphasizes the fact that one does not communicate just for the sake of communicating. One does not in fact communicate at all (like one eats or drinks), but rather one <u>participates</u> in a communicative process whose goal is to convey an intended meaning to the hearer. Bach and Harnish (1979) call this the 'communicative presumption'. This notion of participation is integral to conversation. What is said in a conversation will largely be built on the hearer's perception of the speaker's intended meaning.

Deciphering that intended meaning is no simple task. Certain linguistic and contextual indices are used to help the hearer. Van Dijk (1977) suggested that in deciphering the illocutionary force of an utterance or set of utterances, we gather information from the following:

A. *properties of the structure (as assigned on the basis of grammatical rules);*

B. *paralinguistic properties such as speed, stress, intonation, pitch etc. on the one hand, and gestures, facial expression, bodily movements, etc. on the other hand;*

C. *actual observation/perception of the communicative context (presence and properties of objects, other persons, etc.);).*

D. *knowledge/beliefs in memory about the speaker and his properties or about other properties of the actual situation.*

E. *more in particular: knowledge/beliefs with respect to the type of interaction going on; and the structures of preceding contexts of interaction;*

F. *knowledge/beliefs derived from previous speech acts c.q. previous parts of the discourse, both at the micro (or local) level and on the macro (or global) level;*

G. *general semantic, in particular conventional, knowledge about (inter) action, rules, etc. - especially those of pragmatics;*

H.   other kinds of general world knowledge (frames). (Van Dijk 1977, p. 214)

It is only after integration of all this information will a hearer be able to arrive at the correct message as intended by the speaker. In addition to these pieces of information, there are conditions under which certain illocutionary forces are possible. For instance, one may consider the Gricean Maxims (see section 3.3.) as one such set of conditions. If these conditions are not met and/or if there is a conflict with any one of the pieces of information cited by Van Dijk, a breakdown in communication may occur.

3.2.2. IMPORTANCE OF CONTEXT

Much of the information necessary to decipher the illocutionary force relates to context. In fact most definitions of pragmatics include some reference to the importance of context (Levinson 1984). Context can take on various forms. One may refer to semantic context, to situational context or to the role of knowledge.

Semantic context, for obvious reasons, is undeniably important in the comprehension and expression of a message in discourse (Bellert 1970; Bransford & Johnson 1972; Lundquist 1980; Van Dijk 1977) but, as has been discussed, semantics is not <u>enough</u> to interpret a message (Clark & Lucy 1975; Hymes 1968; Van Dijk 1977). Situational context also plays a major role in pragmatic comprehension, but, again, it is not enough. Borrell and Nespoulous (1973) saw the importance of incorporating situational factors in their 'communication schema' as did Bach and Harnish (1979) in their 'speech act schema' and Planalp (1985) in her 'relational schemata'. Such factors as speaker status and familiarity of participants have gained increasing importance in pragmatics (Holtgraves, Srull, & Socall 1989; MacWhinney et al 1982; Planalp 1985) and any study of conversational behavior must be aware of these factors. If an utterance is appropriate to its context, then, it will be interpreted as its intended meaning (Clark & Lucy 1975) and any subsequent utterances will be related to that context.

3.2.3. PRAGMATICS AND SEMANTICS

When one says that a hearer must decipher what a speaker 'means', reference is made to more than what that utterance means in the language spoken. Reference is made to the underlined meaning. This is the contribution pragmatics has had on semantic theory. A theory incorporating both semantic and pragmatic issues may include a set of semantic representations, a set of rules assigning semantic representations to sentences and a set of inference rules to determine illocutionary force (Bach & Harnish 1979).

Bellert (1970) suggested there may be two types of rules of inference. The first, obtainable by deductive reasoning, is included in the description of language and may refer to the semantic interpretation of an utterance independently of the context. This information would be obtainable through logico-semantic rules. The second rule of inference, obtainable by inductive reasoning, is based on the knowledge of the world, and refers to the broader sense of the term semantics. This inference is not obtainable from logico-semantic rules. It is a result of the processing of pragmatic information (i.e. the context). Inductive inferences make great use of world 'knowledge'. Murphy (1990) suggested that such inferences are so pervasive in linguistic communication that we hardly notice that we must make such inferences. The example cited in his chapter is: "A: *I'm out of gas.*, B: *There's a gas station around the corner.*" (p. 32) In order to correctly identify the underlying illocutionary force of utterance "A", the hearer must infer that the speaker is requesting where he may find some gas. Such inferences are fundamental in the maintenance and proper shifts of topics in conversation. Such implications are so frequent that much of what is unsaid is, in fact, meant (Ellis, Hamilton & Aho 1983; Murphy 1990; Searle 1975; Van Dijk 1977).

3.2.4. PROBLEMS WITH SPEECH ACT ANALYSES

Despite the important role the field of pragmatics has played in conversational analysis, it is not particularly useful in determining conversational coherence. Pragmatic theory received most of its earliest applications in the literature on child language (Bates 1976; Dore 1975; Prutting 1979; Prutting &

Kirchner 1983) and in one well cited study of a speech act analysis of a 5 minute therapeutic session (Labov & Fanshel 1977). In these forms, speech act analysis has taken a checklist format to studying pragmatics in conversation.

Some of these analyses have come to bear on so-called 'adjacency pairs' (see Levinson 1984) which state that one member of an adjacency pair automatically requires a particular second member. Therefore a 'summons' leads to a 'response' and a 'question' to an 'answer' and a 'greeting' to another 'greeting'. This type of information does not enlighten us on the dynamic aspects of conversation. Futhermore, these more 'structural' aspects of conversational behavior, assuming one believes they are so structured, are not the real interests of conversationalists (Bennett 1981).

Levinson (1981) made a further, very eloquent, critique of speech act models of dialogue. First, he noted that speech acts are not unit acts and can express several acts at once. For example, "Would you like a drink?" performs the speech act of offering and request. Secondly, unit acts cannot always be segmented as demanded by speech act theory. For instance, silences can have an illocutionary force and hence, be very communicative. Thirdly, Levinson went on to argue against the principle behind adjacency pairs. An assertion, for instance, can be followed by a whole range of speech acts; not just one, as implied in adjacency pair theory. Lastly, speech act theory appears to assume that topic is always preserved. Topical coherence cannot follow a predetermined set of rules. Topic shifting and maintenance has no place in speech act theory. Topic shifting/maintenance are managed globally in relation to what is going on at that particular time, to what has gone on before, what we know about the speaker, the situation, general world knowledge, etc. These cannot be pre-determined and predicted as would an adjacency pair (Goldberg 1983; Levinson 1981). In summary,

> "Speech act models of dialogue are thus not viable as general models of conversations, even though they may capture a number of observable regularities like those, for example, between adjacency pairs, or in ritualized sequences, like greetings..... My objection to them [speech act models] though is more fundamental than that they are merely partial accounts; I do not

believe that this is, fundamentally, how we participate in conversation at all."
(Levinson 1981 p 114)

3.2.5. SUMMARY - PRAGMATICS

Pragmatics, with its introduction of the notion of <u>use</u> of language, has contributed a philosophical approach to the study of conversation. It has stressed that communication is an interactive process where meaning is conveyed through underlying illocutionary forces. It has also stressed the importance of context in deciphering these entailed meanings. Although pragmatic approaches have brought this very interesting orientation to conversational analysis, it remains an <u>approach</u> and cannot in and of itself explain meaning relationships in a dynamic ever changing discourse like conversation.

3.3. MAXIMS OF CONVERSATION

The first notable attempt at describing conversational interaction was made by Grice (1975). In order to emphasize the importance of cooperation in conversation, he postulated what he called the **Cooperative Principle**. It stresses that conversation is an interactive process and that certain rules must be followed in order for this interaction to be useful. Four 'Conversational Maxims' were then devised in order to guide conversants in following the Cooperative Principle.

<u>Maxims of Conversation</u> (Grice 1975, p.45-46)

QUANTITY:
1. *Make your contribution as informative as is required (for the current purposes of the exchange).*
2. *Do not make your contribution more informative than is required.*

QUALITY:
1. *Do not say what you believe to be false.*
2. *Do not say that for which you lack adequate evidence.*

RELATION:
1. *Be Relevant.*

MANNER:
1. *Avoid obscurity of expression.*
2. *Avoid ambiguity.*
3. *Be brief (avoid unnecessary prolixity).*
4. *Be orderly.*

Many would agree that several of these maxims are not being observed in the conversations of patiens with dementia. At first glance, one could say that these patients violate the Maxim of Quantity in terms of informative content, they violate the Maxim of Relation and the Maxim of Manner. According to Grice (1975) and Mura-Swan (1983) violations of these maxims are possible even within the normal population. For instance, deliberate lies violate the Maxim of Quality. Likewise, we decide to violate the Maxim of Quantity when we refuse to add necessary information (eg: "I cannot say more"; "My lips are sealed") and such phenomenon as implicature and humor violate several maxims.

One maxim that was not well explained in Grice's paper and yet seems to be fundamental in dementia is the Maxim of Relation. Grice did not appear to know how to describe "relevance". Mura-Swan (1983) suggested that several violations of this maxim are possible. For instance, the shifting of a topic in conversation that does not make a 'smooth transition' can be regarded as such a violation.

3.4. THE CONCEPT OF RELEVANCE

It is precisely because of the problem in defining the term 'relevance' as well as the difficulty in determining what is acceptable in conversation that linguists have steered away from conversational discourse analysis and have concentrated on studying judgements of grammaticality (Stubbs 1983). Relevance can be described as the relationship between the proposition expressed and the set of propositions in the hearer's accessible memory (Wilson & Sperber 1981). Based on the hearer's assumption that the speaker is using the Cooperative Priniciple, he will assume that the speaker is intending to make a relevant statement (Werth 1981). This relevancy, however, "is a matter of degree rather than a dichotomous choice" (Tracy 1983, p. 116). One can choose not to be relevant. Conversational digressions are not always 'relevant', yet they are considered by many speakers as still 'coherent' (Dascal & Katriel 1979). This does not, of course, imply that speakers can say anything following another speaker's turn (see Schank 1977 for an excellent

example of this). The point made is that not only can we choose to be relevant in our spoken discourse but all discourse/conversation that we hear can be made relevant by choice. The question of whether or not a statement is relevant,

> "... *depends entirely on the interpreter's ability (or willingness) to infer or invent a situationally plausible, topically relevant motive for the communicator's having included the item: no principled basis for saying categorically that an item is relevant or not seems to exist.*" (Sanders 1983, p. 69)

Sanders (1983) reminded his reader that this was the message that was conveyed in the movie "*Being There*". If one believes that a person is communicatively competent, he/she will <u>interpret</u> the speaker's remarks as being relevant and, more importantly, will work at trying to compensate for any missing or implied information.

This line of reasoning has interesting repercussions on the DAT population. If one assumes that the speaker is 'incompetent' as a communicator, the listener may 'choose' not to bridge any gaps which may occur; chalking up any inconsistencies in interpretation to the disease process. Our perception of this patient as an 'incompetent' communicator may be a result of learned previous experiences with this person or it may be a result of our own biases when we learn that the patient has a diagnosis of dementia. For instance, an irrelevant shift in topic, made by someone we know as a 'competent' communicator or unimpaired neurologically, may pass unnoticed and conversational coherence may prevail. In short, it is not <u>whether</u> a proposition is relevant or not that matters but <u>how</u> the proposition is relevant that is important (Sanders 1983).

Relevance implies having a clear sense of the topic of conversation (McLaughlin 1984; Mura-Swan 1983; Vuchinich 1977). Most conversers would understand what was meant by 'topic of conversation' (Planalp & Tracy 1980), but this does not mean that the notion of "relevance" is fully understood. Such factors as implicature (Murphy 1990), 'Frames' (Frederiksen, Bracewell, Breuleux, Renaud 1990; Korpimes 1978) and the ever important role of knowledge (Clark and Marshall 1981; Engelkamp and Zimmer 1983; Kintsch 1988; Kintsch and Van Dijk

1978; Murphy 1990; Vuchinich 1977; Werth 1981) influence our judgements of relevance. Although there is no consensus in the literature as to a definition for this term, most authors agree that relevance can be had at a 'local' level or at a more 'global' level.

3.5. TYPES OF "RELEVANCE"

3.5.1. THE LEXICO-SYNTACTIC OR 'LOCAL' LEVEL OF ANALYSIS

Relevance is held by keeping a discourse both cohesive and coherent. The first of these terms, 'cohesion', involves *"links that can be derived from the propositional content itself"* (Patry & Nespoulous 1990, p. 15). The second of these terms, "coherence", includes links between the inferences made from propositions.

> *"...the main difference between coherence and cohesion is that the latter is concerned with word-level semantic relations while the former studies higher-discourse processes not always realized by linguistic material"* (Patry & Nespoulous p.15)

Although a 'local' level study of cohesion relies heavily on linguistic analyses, it does not relate to syntactic rules, since these are not necessary for cohesion (Vuchinich 1977). The interest in this form of analysis emanated from the realizations of the inadequacies of story grammars (Mandler & Johnson 1977). Cohesion relates to local semantic information at the word level and how the relationships among these words are realized within the text (Bellert 1970; Frederiksen et al 1990; Mross 1990; Widdowson 1979). It is achieved through argument overlap where new information is added to what was assumed to be 'given' or shared information. The 'shared' or 'given' information is expressed through referencing and lexical cohesion (Bates, Masling and Kintsch 1978; Clark and Marshall 1981; Mross 1990; Patry & Nespoulous 1990). Other terms such as given/new, theme/rheme, and topic/comment (Bates 1976; Clark & Haviland 1977; Goldberg 1983; Haviland & Clark 1974) have been used to relate these different types of information at the 'local' level.

The problem with such a local level of propositional analysis is that it has been used primarily in narrative discourse comprehension and does not lend itself

easily to conversational analysis. It gives no consideration to underlying meaning, ignores causal relationships (Mross 1990) and uses a bottom-up approach which limits itself in terms of strategy and top-down prediction (Engelkamp & Zimmer 1983). Such 'sentence topic' relations link pieces of information linearly, whereas 'discourse topics' are necessary to globally organize the information (Van Dijk 1981; Van Dijk and Kintsch 1983).

3.5.2. THE GLOBAL/THEMATIC LEVEL OF ANALYSIS

3.5.2.1. IMPORTANCE OF TOPIC

In a conversation, it is, at least initially, the theme or topic of the conversation which keeps it together (Goldberg 1983). In understanding a speaker, the hearer will try to determine how the speaker's utterances relate to the main point in the conversation, to information stored in memory about the speaker, previous interactions, shared knowledge and to information in the immediate environment. The hearer will then redefine what the topic of conversation is, based on these global conclusions (Wardhaugh 1985) and make judgements of relevance and coherency as the conversation evolves (Golberg 1983; Tracy & Moran 1983). In determining relevance, having a notion of the topic is crucial to making a pertinent contribution (McLaughlin 1984). Conversers do not relate to just one topic of conversation and there often exists a multitude of shifts. If one assumes that conversational partners function under Grice's Cooperative Principle, then it is their duty to make these shifts as relevant as possible. Determining how these shifts take place is the *"most important and complex process involved in conversational analysis"* (Patry & Nespoulous 1990, p. 20).

3.5.2.2. THE ANALYSIS OF TOPIC SHIFTS

3.5.2.2.1. Initial Attempts

Using the notion of topic as a conversational unit of analysis appears to be warranted. In trying to determine if topic change points were easily identifiable by conversers, Planalp and Tracy (1980) asked 120 subjects to segment 2 conversations into topics without giving them any definition of topics or topic changes. Agreement was quite good ($r = .926$ on conversation 1 and $.919$ on conversation 2).

Although there was excellent agreement on the division of a conversation into topics, it did not imply that there was agreement as to the types of transitions that might occur between these 'topic units'.

Keller (1981) suggested that 'gambits' (a kind of starter phrase) are used to facilitate transitions. Mura-Swan (1983) suggested that hearers may suspend their judgements of relevancy during a shift in topic until more information is available to support their impressions. Dascal and Katriel (1979) tried to make a case for the existence of digressions as an example of 'permissible' topic shifts. Patry & Nespoulous (1990) go a step further and suggest four basic requirements which must be realized in order to produce a 'permissible' topic shift.

> "...the participant who wishes to undertake a topic shift in conversation must (1) inform the other participant(s) of a desire to abandon the discussion of the topic at hand, (2) receive the agreement of the other participant(s) to do so, (3) introduce the new topic for discussion, and (4) establish the relevance or the absence of relevance of this topic to the preceding one(s)" (Patry & Nespoulous 1990 p.20)

Schank (1977) proposed that shifts occur on the basis of discursive 'free association' to the previous topic on the part of the speaker. Golberg (1983) discussed the importance of using the notion of a 'move' to symbolize this 'thought unit'. A move links itself to the previous topic through lexico-syntactic ties, as in the local level of analysis, but it does not specify which lexical item or syntactic structure is responsible. Unlike the notion of shift expressed by Patry & Nespoulous (1990), a 'move' does not presuppose an agreement on the topic discussed (Golberg 1983). Goodenough and Weiner (1978) explained how a pair of 'passing' moves such as "mmhm, yeah..." can serve to indicate the imminent conclusion of a topic.

Another concept put forth to explain the transitions between topics was the notion of a "context space", introduced by Reichman (1978). Because topics cannot be said to shift at each utterance, Reichman suggested that successive utterances relating to the same topic be considered as part of the same "context space" and topic shifts considered as transitions from one context space to another. The author

further classified context spaces into two types: issue context space and event context space. The former referred to a general activity or state (eg: 'Boys hitting girls' or 'Mary being depressed') and the latter referred to a particular episode that occurred sometime in the past.

Tracy (1982) had 80 students identify the topic of conversation of 5 dialogues; each with different issue/event formats. She found that issue context spaces were usually considered the topic of conversation when there were both issues and events. When the conversation only had a single event, that event was considered the topic of conversation. In a second experiment, in that study, Tracy (1982) looked at subjects' judgements of the appropriateness of different continuations of the conversations. Two choices were continuations of the 'issue' and two continued the 'event'. These constructions were artificially construed and may not be generalizable to natural conversations but, nevertheless, subjects tended to judge 'issue' continuations as more appropriate than 'event' extensions. She later supported these results in another study (Tracy & Moran 1983) which also described particular types of linkages or continuations one may have of the issue.

In summary, initial attempts at describing topic have shown that topics, as such, are easily identifiable and that what is of more crucial and urgent importance is to describe how the transitions between these topics is made.

3.5.2.2.2. Typologies

Most typologies incorporating the notion of topic shift transitions use surprisingly similar concepts with differing terminology. Most authors agree on three (possibly five) basic types of shifts. The *first* of these describes a shift to a topic that was not previously discussed and which does not incorporate information from the previous topic. This type of shift has been termed "Introducing Discourse Topic (Discontinuous)" (Keenan & Schieffelin 1976), "Topic Initiation" (Crow 1983) and has been referred to by Brinton & Fujiki (1984) under "Topic Change". Keenan & Schieffelin (1976) have suggested that this type of shift is noncoherent but Crow distinguishes between this and 'Noncoherent' shifts by the nature of the

interchange before the shift. A 'Topic Initiation' indicates that the conversers had finished the previous topic, whereas in a 'Noncoherent' shift, there is no evidence that the conversers had completed their discussion of the previous topic.

The *second* type of shift is one in which there is a return to a topic previously discussed. Keenan & Schieffelin (1976) refer to this as "Reintroducing Discourse Topic (Discontinuous)", Crow (1983) as "Renewal" and Brinton & Fujiki (1984) as a second type of "Topic Change". The *third* type of shift signals its relation to the previous utterance and incorporates some of this previous information. This shift is termed "Incorporating Discourse Topic (Continuous)" by Keenan & Schieffelin (1976), and "Topic Shading" by both Crow (1983) and Brinton & Fujiki (1984). Different linkages which describe how previous information is integrated in a Topic Shading shift is further discussed by Tracy & Moran (1983). Lastly, Crow (1983) introduces *two more* types of shifts: 'Noncoherent' (discussed above) and 'Insert'. This latter shift indicates an *"abrupt shift that does not succeed in gaining the topical floor"* (p. 148); an aside where conversers have every intention to return to the topic at hand.

In summary, a typology for topic shifts is not only possible but many of the similar concepts are repeated in various theoretical papers. Using Crow's typology, then, topic shifts can be grouped into Topic Initiation, Topic Shading, Renewal, Noncoherent and Insert.

Other authors have gone a step further and tried to find a categorization for the contexts to which shifts may relate (Planalp & Tracy 1980) or the possible reasons why a shift may take place (Maynard 1980). In the Planalp & Tracy (1980) paper, topic shifts were seen as having conversational or nonconversational contextual foci. Conversational contexts were described as pieces of information that either immediately preceded or occurred earlier in the discourse. In a nonconversational contextual focus, the shift related to environmental or unspecified information. In turn, each of these was seen to be explicitly or implicitly stated.

Maynard (1980), on the other hand, focussed on the reasons why a shift may occur. A shift in topic may be necessary:

1. following the occurrence of a series of silences,
2. in order to restore topical talk following a story,
3. due to an absence of supportive nontopical talk (eg: uhmmm) which helps to keep the conversation going,
4. due to an absence of supportive nontopical talk after you have introduced a new topic, indicating that your partner does not wish to continue along this train of thought,
5. in order to refocus the conversation,
6. due to absent supportive nontopical talk and refocusings in combination, and
7. due to disagreements.

Clearly, there are efforts being made in trying to categorize the 'body' of conversation and to describe how conversers achieve this coherence while maintaining a series of topic shifts. Planalp & Tracy (1980) believed that development of a typology of topic shifts is greatly influenced by how we perceive the way in which conversers integrate information.

The ability to integrate this information is especially vulnerable in understanding and making topic shifts. As has been mentioned above, processing discourse involves extracting information from a great number of contexts, be they semantic, situational or from the knowledge structure. The ability to understand and/or make a shift in topic of conversation implies some level of cognitive competence which allows you to integrate this information. In addition, if information gathered from these sources is conflicting, the hearer must 'fill in the blanks' from information he may have in memory and arrive at the best possible interpretation (Kintsch & Van Dijk 1978). Although the mechanism by which a 'competent' communicator goes about integrating this information is not completely understood, some very attractive models of processing have been suggested.

3.5.2.3. MODELS OF DISCOURSE PROCESSING

Theoreticians interested in formulating a model of processing for information beyond the sentence, were concerned with three basic problems (Miller 1985). The

first concern was how the 'meaning' of the text is represented in memory. The second concern was how the text information is extracted from the text itself and the third consideration was how this representation is influenced by the knowledge structure. One model which has received wide consideration is the one developed by Kintsch and Van Dijk (Bates et al 1978; Kintsch 1988; Kintsch & Van Dijk 1978; Van Dijk 1981; Van Dijk 1980; Van Dijk 1977; Van Dijk & Kintsch 1983). The model presented by Kintsch and Van Dijk is much too complex to describe in great detail for the purposes of the present research. Familiarity with some of the basic concepts introduced by these authors will suffice to understand how impairment in some cognitive functions such as memory could conceivably lead to discursive problems and more specifically a possible description of topic shifting styles.

3.5.2.3.1.Microsturctures, Macrostructures & Superstructures

Most authors would agree that a sentence's meaning can be represented by what is called a 'proposition' (see Mross 1990). For instance, the following example: *"The lawyer discussed the case with the judge. He said "I shall send the defendant to prison."* could be represented as the following propositions:

Proposition 1:	"DISCUSS [LAWYER,JUDGE,CASE];
Proposition 2A:	SAY [LAWYER, [SEND [LAWYER,DEFENDANT,PRISON]]]; AND
Proposition 2B:	SAY [JUDGE [SEND [JUDGE,DEFENDANT,PRISON]]]."
	(Kintsch, 1988)

The psychological reality of propositions and a detailed analysis of how one goes about developing such propositions is eloquently covered in other reviews (Frederiksen et al 1990; Mross 1990; Van Dijk and Kintsch 1983).

The question addressed by discourse models is how these propositions are tied together and represented in memory. In the example above, the question would concern how Proposition 1 is tied in with Proposition 2A or with Proposition 2B and how one goes about choosing whether the speaker intended to communicate

interpretation 2A or 2B. As has been reviewed in the above sections, coherence can be had at the local and global levels. Local coherence can be realized in terms of the MICROSTRUCTURE, according to the Kintsch and Van Dijk model. The microstructure forms a connection between two propositions based on argument overlap. In the example given above by Kintsch, Proposition 1 and Proposition 2A repeat the item LAWYER, signifying a relationship between the two. The argument 'LAWYER' is repeated in Proposition 2A in order to tie in with Proposition 1 and it is expressed in the sentence through the use of pronominal referencing ('He'). In Interpretation 2 (Proposition 2B) the same mechanism applies but this time "He" is expressed propositionally as referring to "Judge" and hence the argument "JUDGE" is overlapped. The 'old' information (information presented in Proposition 1) is repeated and 'new' information is added. Although this type of local coherence analysis is much more sophisticated than presented here, it remains a local analysis. Argument overlap analysis will help in deciphering how two propositions related to each other, but one needs additional information in order to arrive at the appropriate interpretation and intention of the speaker (Interpretation 2A or Interpretation 2B). The hearer must resort to higher level coherence relationships to decipher the message as it was intended (Black 1985; Fletcher 1986; Frederiksen et al 1990; Kintsch & Van Dijk 1978; Mross 1990; Tracy 1982; Van Dijk 1983; Vuchinich 1977).

The local model of discourse processing, although powerful, is not adequate to explain topicality skills in conversation (Tracy 1982). What is needed is the formation of a hierarchy of propositions that allows the listener to form higher level, more salient propositions which can be identified as a 'topic'. It is this kind of information that Kintsch and Van Dijk have tried to describe in their development of a MACROSTRUCTURE. The formulation of topics in conversation is basically a function of the macrostructure and is, in essence, a type of macrostructure (Mross 1990; Planalp & Tracy 1980).

Propositions are formed into a macrostructure by using MACRORULES (Kintsch & Van Dijk 1978; Lorch, Lorch & Matthews 1985; Mross 1990; Van Dijk

1980). These rules relate the information gathered from the microstructure to a more global dimension of the text. Kintsch and Van Dijk (1978) and Van Dijk (1980) identified three basic macrorules. Propositional information in the microstructure can be either deleted, generalized or constructed to form new propositional information called a MACROPROPOSITION. Macropropositions are then processed to form the macrostructure.

Formulation of this macrostructure implies that one must cognitively process the information and decide what is kept to be further processed and what will be discarded. Although most authors would agree that communicators apply strategies to form some type of hierarchical structure such as the one proposed by Kintsch and Van Dijk, they do not all agree on the nature of these strategies.

One mechanism which may be used to relate propositions into a hierarchical whole is what Kintsch and Van Dijk have termed SUPERSTRUCTURES. Superstructures characterize the functional relations between macropropostions (Van Dijk 1980) and have been variously termed "schemata", "frames" and "scripts". A "schema" is an 'outline' which binds semantic information into a concept. For instance, a "schema" of a conversation would contain information stating that a conversation typically has a beginning, an end and a middle. A "frame" is used when it involves prototypical combinations of concepts. For instance, how one communicates in a restaurant versus a library would be information stored in "frames". "Scripts" refer to even more specific information relating to a specific goal, a specific episode. For instance, a converser may want to communicate specific information to a judge in a courtroom. The "script" would guide the speaker in choosing the appropriate propositions in that setting at that particular time. Therefore, superstructures are rigid, preset semantic 'outlines' of propositional information. Because of this rigidity, Kintsch himself (1988) has questioned their applicability to conversational usage over a broad range of situations.

3.5.2.3.2. Pragmatic Comprehension

Pragmatic analysis of discourse will give another source of information for formulating appropriate macrostructures and arriving at intended meanings. In fact, one can argue that some pragmatic information is included in superstructures. As has been stressed throughout this chapter, pragmatic information is crucial to interpreting entailed meaning. In a conversational situation, perceptions of what is intended by the speaker will be greatly influenced by the contextual foci of the utterance.

Holtgraves et al (1989) found that in certain situations, speaker status affected whether remarks were remembered as assertive or not. MacWhinney et al (1982) and Keenan, MacWhinney, and Mayhew (1977) found that sentences with differing illocutionary and perlocutionary acts were remembered to differing degrees. High interactional content sentences (eg: *"Do you always put your foot in your mouth?"*) were remembered more than low interactional content sentences (eg: *"Do you always use CRT displays?"*). In Planalp & Tracy's (1980) study, how skillful a subject was at changing a topic, and the salience of the context that was used, affected listeners judgements of the speakers as competent communicators, their perceptions of the speaker's involvement and attentiveness to the listener and the degree to which the conversation was easy to follow.

In short, a speaker must make great use of pragmatic information if he wishes his utterance be <u>interpreted</u> as he had intended (Van Dijk 1977). Some of this contextual knowledge is perceived simultaneously in the environment but some of this pragmatic information is stored in memory in some sort of knowledge structure. It is only after integration of this knowledge, pragmatic information and propositional information that one can arrive at an appropriate macrostructure and topic.

3.5.2.3.3. Integration

Integration, then, is made by amalgamating information derived from two major sources: the Text Base and the Situation Model (Kintsch 1988). The Text Base is formed from the propositional information found in the micro- and macro-structures. The Situation Model is formed using knowledge and nonpropositional information.

According to Kintsch and Van Dijk (1978), in the formation of a coherent Text Base, the hearer must first check for referential coherence. If, during this process, a gap should be found where there is no referential coherence, inferential techniques could be used to draw on information from memory in order to hypothesize how these propositions are related. The additional information derived from memory is added to the propositional information so that coherence can be had.

Because our working memories have a limited capacity, it is impossible for hearers to continually add information in arriving at a coherent text base, and information must be processed in cycles. Only some of the propositions can be kept in the Short Term Memory buffer at any one time. According to the model, strategies are used to drop or reshape the propositions so that there will be room in the buffer for the new incoming propositions.

Many strategies have been suggested as useful in deciding which propositions will be stored in the Short Term Memory buffer to be further processed (Britton, Glynn, & Smith 1985; Fletcher 1986; Fletcher 1981; Kintsch and Van Dijk 1978). Kintsch and Van Dijk (1978) proposed a 'Leading edge strategy' which basically states that those propositions which occur the most frequently and which are the most recently processed will be the ones retained in the Short Term Memory buffer. The Spilich (1983) paper reviewed in the section on Normal Aging (section 2.1.3.), hypothesized that both normal young and elderly subjects used this strategy but that the elderly-impaired used a random load model.

Fletcher (1986) has challenged the leading-edge strategy hypothesis and has found that a strategy based on the plans and goals of the characters in a text provides a better description. Britton et al (1985) did not appear to espouse to one single approach, but suggested that there are several strategies which may be appropriate in different contexts and that such factors as familiarity with the information would reduce information processing and require perhaps less elaborate tactics.

Kintsch & Van Dijk (1978) noted that sometimes speakers may not entrust their listeners with the ability to correctly select what is an important proposition. In such instances they may begin each new utterance by repeating the necessary information. One can hypothesize that this may be the process involved in 'Topic Shading'. To account for the fact that the speaker is going to be 'irrelevant', the speaker signals to the hearer how his new proposition relates to the last topic or macrostructure. In this way, the hearer may correctly choose the appropriate information for integration.

In an interesting paper, Lorch et al (1985) questioned whether this macro-processing was really done on-line as proposed by Kintsch and Van Dijk or whether the integration of information could be processed later. They used a reading paradigm, which, of course, is fundamentally different from conversation. In any case, they hypothesized that readers may typically be 'lazy' processors and realize only in hindsight, after having read a few pages, that they did not really understand what they had just read. Their argument is that if readers process the information in cycles, on-line, they should be continually up-to-date on the information they've read and have a continually modified coherent macrostructure. Lorch et al found support for on-line macroprocessing and found that the processing of this information on-line is under the control of the reader.

It is difficult to imagine how an interactive discourse such as conversation could progress without on-line macroprocessing. In fact, those of us who have been

caught 'tuning out' of a conversation or losing the train of thought, have been hard pressed to find a relevant statement to add to the conversation. Often, the person will make a statement that is relevant to the information that was shared prior to 'tuning out' or will rely heavily on prior knowledge to develop a plausible macrostructure to which he can respond, even though this may not be at all what was being discussed.

The suggestion made by Lorch et al (1985) that this on-line macroprocessing is under the control of the hearer/reader, coincides quite nicely with Sanders (1983) suggestion that one can choose to understand a statement as being relevant. If the hearer has decided that the speaker has nothing of value to say, he may not make the effort to process the information on-line in order to achieve coherence.

Whatever the strategies one uses to choose the propositions for retention in Working Memory, the importance of knowledge in arriving at the appropriate macrostructure is undeniable. Mutual knowledge allows a speaker/hearer to make/understand implicit statements (Van Dijk 1980). Bransford and Johnson (1972) have found that having prior contextual knowledge facilitated comprehension.

Mutual knowledge can be seen as incorporating three sources: community membership, physical copresence and linguistic copresence (Clark and Marshall 1981). Mutual knowledge is not simply a case of knowing the same things as the person you are speaking with; it includes knowing what that other person knows and vice versa (Murphy 1990). In other words, in order to not violate the maxim of quantity, you must not repeat information you know your hearer already knows. Fundamentally, in conversation, one is trying to communicate something new. That implies not telling the hearer things he already knows. When making a relevant contribution to a topic of conversation or when shifting the topic appropriately, a speaker will draw on the knowledge he has about what is stored in his conversational partner's memory: the community in which he belongs, the immediate physical environment and the linguistic information that was shared previously in the conversation. Frederiksen et al (1990) stressed the use of

knowledge from 'frames' as well as other types of knowledge in choosing relevant statements. Kintsch (1988) found that 'frames' were too inflexible for the ever changing context of conversation. Kintsch's vision of the structure of the knowledge system is a very attractive one for conversational discourse. He suggested that a knowledge system is an 'associative net' of which the nodes are concepts and propositions. The structure of the knowledge and its interrelationships are not prestored as in a 'frame' but <u>developed</u> in relation to what is going on in the context of the task for which it is needed. A particular concept will take on a different 'meaning' as the discourse unfolds.

In summary, propositional information from the micro and macrostructure form the Text Base. Nonpropositional information from pragmatics and mutual knowledge forms the basis of the Situation Model. Integration of all this data is done through a very complex, not yet fully understood process of strategies and a notion of the intended meaning is achieved.

3.6. SUMMARY - CONVERSATION

Conversation is not random behavior. There are rules for communicating such as postulated in Grice's Maxims. One of these maxims, the Maxim of Relation, states that one must be "relevant". Further exploration of the term "relevance" leads to the conclusion that this notion is not easily explainable. One element which seems crucial is the notion of topic and how meaning is related to topic. Analysis of these relations could be made at the "local" or "global" levels or by taking a "speech act theory" approach. Neither the "local level" nor speech act theory have proven useful in describing topical coherence in conversation. The main contribution of pragmatics was the stresses put on context and the notion of entailed meaning.

The global level of analysis requires that one have a notion of topic. Several initial attempts have tried to divide the conversation into 'context spaces' or 'moves' but the ability to identify topics appears to be a 'natural' phenomenon. What is of greater interest in conversational coherence is how one succeeds in

shifting topics while keeping the conversation relevant. Typologies for topic shifts have been developed and although they use different terminology, the descriptions of these basic types are very similar.

Beyond simply categorizing the types of shifts, authors have stressed the importance of using context and knowledge in integrating this information for appropriate shifts. A model of text analysis, the Kintsch and Van Dijk model, describes how such information integration occurs and proposes that propositional information can be processed in cycles in order to form a hierarchical structure called a macrostructure. A topic of conversation can be seen as one such macrostructure. In order to integrate this information, the hearer would draw on the text base and the situational model (which incorporates nonpropositional information from memory and the context). This macroprocessing appears to occur on-line and the strategies used for constructing an appropriate representation may differ.

CHAPTER 4

STATEMENT OF PROBLEM AND QUESTIONS

As a result of the review of the literature many unanswered questions remain regarding the nature of the communication problem in patients with dementia, and particularly those with Dementia of the Alzheimer Type (DAT). Communication problems are one of the behavioral characteristics of DAT. Although there are some impairments in several areas of communication, the majority of difficulties found in communication in dementia are at the lexico-semantic and discourse levels. Research on the lexico-semantic nature of the problem is well documented whereas research addressing the discursive problems is scanty.

Research on conversational discourse, in particular, is almost nonexistent and yet conversation is the fundamental pillar of communication. Many have steered away from such an analysis due to the inherent methodological problems but conversational discourse is not made up of totally random sequences of utterances as one may initially suspect. Although conversations have structural components, it is the meaning relationships that link these structural components. Meaning relationships is precisely the area in which DAT subjects are known to have difficulty.

Meaning relationships are best expressed in conversation through topic and one of the more fruitful ways of looking at discourse continuity is to formulate rules for "permissible" topic shifts. The notion of topic structure and an ability to "flow" from one topic to the next is indicative of a competent communicator who is able to form an internal representation of a coherent, well integrated discourse structure.

Processing and integration of information in discourse may be done in cycles according to the Kintsch and Van Dijk model and this operation uses several memory systems. For instance, propositional information must be stored for brief periods of time in working memory and consolidated with other new information

previously stored in secondary memory. The role of Working Memory according to Baddeley (1986) is to temporarily hold and manipulate information during a task such as comprehension. The literature on memory in DAT points to a Working Memory deficit with possible particular impairment in the central executive whose role is to coordinate and integrate all this information.

The development of a macrostructure is a theoretical model which can be applied to the development of topic in conversation since a topic is, in fact, a macroproposition. The ability to maintain and appropriately shift a topic of conversation, then, could be seen as an ability to do on-line macroprocessing. Hence, an impairment in memory systems, provided they have this influence on discourse, should result in a difficulty with processing topic in conversation.

Typologies for topic shifting styles are being developped and have gone a step beyond the usual checklist of pragmatic behaviors. Dascal and Katriel (1979) state that "... *the first challenge in discourse analysis is to account for our intuitions*" (p. 203). Based on the literature so far on the discourse abilities of DAT patients and on their performance on tests of memory, one could intuitively suggest that their abilities to produce appropriate topic shifts in conversation would be somehow impaired. Before such "rules" for "permissible" topic shifts can be developped with DAT subjects, there must be a description of their topic shifting abilities that is more precise than verifying its presence in a pragmatic checklist.

The present doctoral dissertation has given itself these goals. The paucity of research in this field has prevented the development of precise hypotheses regarding the nature of the topic shifting profile and therefore the endeavor has been to set objectives of description rather than predictive hypotheses. After describing the methodology used in this investigation, more informative descriptive hypotheses will be put forth in Chapter 6. In short, the present research has undertaken the following objectives:

1. To describe in as great detail as possible the topic shifting profiles of certain patients with DAT in comparison to those found in normal elderly subjects.

2. To describe in as great detail as possible the topic shifting profiles of a normal adult conversational partner engaged in conversation with a subject affected by DAT in comparison to a conversation with a normal elderly subject. Assuming the DAT subject produces inappropriate topic shifts, as shown in the literature, then the endeavors made by the normal partner to keep the conversation relevant should be different from those used when she is conversing with a normal elderly subject.

3. More specifically, the present research wishes to explore:

    A. the basic structure of topic manipulation (i.e. percentage of topic maintenance and topic shifts; place of shift)

    B. the technique used to shift the topic (based on Crow's typology).

    C. the possible reasons for the occurrence of the shift (partly based on Maynard 1980)

    D. the contexts to which the shift occurred, including the role of knowledge (partly based on Planalp & Tracy 1980).

In so doing, a first step will be taken at better describing one aspect of the natural conversational abilities of some DAT subjects. This much needed detailed description based on theoretical models of discourse processing may help in providing insight into the effects of a demential syndrome such as DAT on the interactional communicative abilities of certain subjects.

CHAPTER 5

METHODOLOGY

The present research proposes a multiple single case descriptive study of topic shifting styles in DAT and normal elderly (NE) subjects in conversation with the same normal unfamiliar conversational partner in a "natural" setting. A descriptive study was required at this point since no research interested in brain damaged populations has concentrated on topic shifting behavior per se. Likewise, no neuropsychological or neurolinguistic research has investigated topic shift behavior using typologies and concepts developed in human communication research.

Traditionally, the methodology used to study topic related issues in the conversations of brain damaged subjects has been to tick off a category, usually called "appropriate topic shift" or "inappropriate topic shift" in a checklist of behaviors (Davis & Wilcox 1985; Holland 1982; Holland, Miller, Reinmuth, Bartlett, Fromm, Pashek, Stein & Swindell 1985; Morin 1985; Penn 1985; Prutting & Kirchner 1983; Rampello, Wright & Wollner 1982; Rees 1978). As a result, any initial exploration into the topic shifting styles of a brain damaged population, must, at this time, be descriptive.

In developing the customary checklists, investigators have tried to capture, prematurely, the essence of conversational discourse. In a sense, the "essence" of conversational discourse may not be "capturable" at all (Bennett 1981). What is needed is a description of what is happening in a particular exchange with specific participants. Another interaction with those same participants may yield very different results, but it remains that much can be learned about the processes that were involved during the conversation that was observed. Although checklists were initially useful, it is time to concentrate on only one aspect of these checklists and try to define it as clearly as possible.

A multiple case study as opposed to a group study paradigm was chosen as best able to provide this descriptive information. Aside from the reasons mentioned

in the previous chapter for avoiding to study conversation, researchers have also steered away from this type of investigation because it does not lend itself well to group study. First, a group study of conversational behavior requires control of those extraneous factors which influence conversational behavior. Results are, otherwise, inevitably nonsignificant. The number of factors involved in performing a topic shift and/or maintaining a conversation are so numerous and cumbersome to be operationally controlled. Furthermore, control of all these factors implies developing a very artificial situation which may not be representative of conversation at all.

Secondly, the group approach requires a significant number of subjects to balance for the degree of variability. The amount of data generated by a significantly long enough conversation to explore topic shift behavior is enormous. A large subject sample would be unmanageable for research purposes.

Thirdly, the heterogenous nature of the subject populations involved in the present study also warrant a single case design (Ska, Poissant, Béland, Lecours, Joanette 1990). As discussed in the previous chapter, not only the heterogenous nature of conversation is important but the cognitive heterogeneity found in DAT and normal elderly subjects is particularly troublesome in a group design.

Fourthly, the literature has shown that on-line macroprocessing of topics is optional (Lorch, Lorch & Matthews 1985). Lorch, Lorch and Matthews have postulated that there may be individual differences in how actively topic structure processing is done. What is of interest is how these goals are achieved; not whether everyone has the same goals. In this sense, if the topic structure processing is different depending on the personal goals of the converser, this heterogeneity makes conversational analysis even more attractive in that it may reveal a whole variety of topic shifting strategies. Case studies allow one to concentrate on these differences in strategy rather than assume the null hypothesis.

In short, it is felt that the case study option as a methodological choice is warranted at this stage of research in conversational analysis of brain damaged populations. A _multiple_ case study allows maintenance of freedom of individual analyses while minimizing the possibility that a single case is an unusual subject.

5.1. SUBJECTS

The present study included 11 subjects: 5 with probable Dementia of the Alzheimer Type (DAT), 5 normal healthy elderly who served as normals for comparison (NE) and one normal healthy younger adult (S.W.) who served as conversational partner for all subjects. All subjects were female, to control for possible sex differences. In order to avoid the controversy over the existence of senile and presenile dementia, all subjects (except the conversational partner) were 65 years of age or older (DAT: range = 69-76 years; mean = 72.8 years; NE: range = 67-76 years; mean = 72.0 years; conversational partner = 42 years; Table V.1.). To control for impact of cultural and/or educational influence (Emery 1985; Hymes 1968; Murphy 1990; Stubbs 1983), all subjects, except one, had a high school education (one DAT subject - A2 - had an 8th grade education), were Canadian born (one NE subject -N4 - was born in England but moved to Canada when she was 2.5 years old) with preferably Canadian born parents and were unilingual English speakers. All subjects received an audiological screening by an audiologist to rule out any major hearing problems which may affect conversation on a one-to-one basis.

5.1.1 DAT SUBJECTS

All DAT subjects had a diagnosis of probable Alzheimer Disease following the criteria set up by the NINCDS-ADRDA Work Group (McKhann et al 1984) (see Table V.2. for a summary of those factors which did not comply with these criteria). One subject, A1, has since had the diagnosis reconsidered and it is now doubtful that she has DAT. The present working diagnosis is Multi-Infarct Dementia. All information was documented for descriptive purposes and did not serve to specifically categorize subjects for group comparisons. Subjects were

PAIR	SUBJ.	SEX	AGE	D.O.B.	EDUC.	PAST OCCUP.	PLACE OF BIRTH	OF PARENTS
1	A1 (DAT)	F	76	04/05/13	SECONDARY	SECRETARY/ ARTIST	WIN-NIPEG	BARBADOS (F) MONTREAL (M)
	N1 (NE)	F	76	19/12/12	SOCIAL WORK DEGREE; NO BACHELOR'S	SOCIAL WORKER	OTTAWA	NOVA SCOTIA (F) OTTAWA (M)
2	A2 (DAT)	F	69	24/05/20	GRADE 8	HOUSEWIFE	OTTAWA	QUEBEC (F) ONTARIO (M)
	N2 (NE)	F	67	27/08/22	SECONDARY, SOME UNIV.	SECRE-TARIAL	OTTAWA	ENGLAND (F) OTTAWA (M)
3	A3 (DAT)	F	73	28/09/16	SECONDARY	CLERICAL/ SALES	ST. JOHN, N.B.	NOVA SCOTIA, NEW BRUNSWICK
	N3 (NE)	F	74	27/08/15	10TH GRADE, COMMER-CIAL	SECRE-TARIAL	OTTAWA	OTTAWA (F) ENGLAND (M)
4	A4 (DAT)	F	72	27/01/17	SECONDARY, SECRE-TARIAL	SECRE-TARIAL	FREDER-ICTON	NEW BRUNSWICK
	N4 (NE)	F	71	21/12/17	SECONDARY, SECRE-TARIAL	SECRE-TARIAL	ENG-LAND, MOVED AT 2.5 YEARS	IRELAND (F) ENGLAND (M)
5	A5 (DAT)	F	74	15/09/15	SECONDARY	HOUSEWIFE	CARL-ETON PLACE, ONT.	CARLETON PLACE, ONT.
	N5 (NE)	F	72	01/03/17	SECONDARY	HOUSEWIFE	OTTAWA	OTTAWA

Table V.1.: Subject Demographic Information: D.O.B. = Date of Birth, DAT = Dementia of the Alzheimer Type, NE = Normal Elderly.

SUBJECT	NONCOMPLIANCE
A1	- possible deterioration in memory only - some focal problems: balance problems - compliant on all others
A2	- progressive nature is very slow - almost no progression - compliant on all others
A3	- some hypertension - compliant on all others
A4	- seizures at age 10 - EEG: (Nov 1985): moderate difffuse disturbance; sharp waves in temporal area; more on left
A5	- full compliance

Table V.2.: Noncompliance for NINCDS-ADRDS Criteria

chosen from the Memory Disorders Clinic at Ottawa General Hospital. One subject (A4) was referred by the Alzheimer and Related Disorders Unit - Ottawa General Hospital. All received routine neuropsychological tests (summary of scores Table V.3.), neurological and systemic tests. Likewise, subjects were staged for their dementia using the Global Deterioration Scale from Reisberg and collaborators (Reisberg, Ferris, DeLeon and Crook 1982). All subjects, except for A1 were in a Stage 5 (Moderately severe cognitive decline or early dementia) according to this scale. Subject A1 was considered Stage 4 (Moderate Cognitive Decline). In addition, patient subjects were evaluated using the "Logical Memory" subtest from the Wechsler Memory Scale (Wechsler, 1945) as well as received a full Boston Diagnostic Aphasia Examination (Goodglass & Kaplan 1972). All subjects received a score of "0" on the delayed recall portion of the "Logical Memory" subtest.

Figure 5.1. summarizes the BDAE test results. Virtually all subjects had difficulty with the "Complex Ideational Material" subtest (Subtest 7, in Figure 5.1.) and most had difficulties in Fluency Naming (Subtest 10, Figure 5.1.). The BDAE allowed a more detailed investigation of these DAT subjects' language abilities as tested by a standardized aphasia test. Subject A5 appeared to be the most "aphasic" and subject A1, the least. In order to eliminate the effects of institutionalization on subjects' conversational skills, all DAT subjects were living in the community in their own home.

5.1.2 NORMAL ELDERLY SUBJECTS

Healthy elderly were defined as having a *"history of good health, lack of chronic illness, and [be] self sufficient in everyday function"* (Emery 1985, p. 17). Each normal elderly was matched for age and education to a single DAT subject. The only pair that was not appropriately matched was pair A2/N2. Matching subject A2 to a NE subject with equivalent education did not yield considerable differences in results and so the pair was kept as presented.

The normal conversational partner was 42 years of age and a professional social worker who was familiar with DAT patients but not with these particular subjects. Familiarity with the subjects was an important factor since mutual knowledge is used to

SUBJ	DEM RAT.	REIS BERG	HA-CH	DATE TEST	OGH SCR-EEN	MA-TH	APRA XIA	MMS	KATZ-MAN (DEM-ERIT)	MATTIS	LOGICAL MEM.
A1	.5	4	0	22/8/89	30/40	5/8	9/9	22/30	14/28	122/144	7 DELAY, 0
A2	1	5	1	30/1/89	22/40	2/8	4/9	19/30	20/28	100/144	2 DELAY, 0
A3	2.5	5	1	2/5/89	21/40	3/8	9/9	18/30	22/28	94/144	0
A5	1	5	1	16/1/89	12/40	1/8	9/9	10/30	28/28	100/144	1 DELAY, 0

A4   Report from Neuropsychologist. A4 was not seen by Memory Disorders Clinic and therefore did not get the same tests.

Aphasia: none
Apractognosis: none
Verbal I.Q.: = 98; Performance I.Q. = 92; (08/10/85)
Full Scale I.Q. on R-WAIS   =   95 (1985)
                   =   113 (1984)
                   =   114 (1983)
WMS: M.Q.   =   93 (1985)
                   =   101 (1984)
Randt: delayed recall of 43; Memory Index of 60: "Increased difficulty on tests of ability to retain new information following delay."
Trail Making: borderline Normal
Tactual Performance Test: mild to moderate
MMPI: no dysfunction
Hierarchic Dementia Scale: 166/200.
Logical Memory: 0
Reisberg: 5

Table V.3.: DAT Subjects' Neuropsychological Test Results: Dem Rat. = Clinical Dementia Rating (Hughes et al 1982); Reisberg = Global Deterioration Scale (Reisberg et al 1982); Hach = Hachinski Scale (Hachinski et al 1975); OGH Screen = Ottawa General Hospital Screening Mental Status Examination (Memory Disorders Clinic); MMS = Mini-Mental State (Folstein, Folstein and McHugh 1975); Katzman = Katzman Short Orientation Test (Katzman et al 1983); Mattis = Mattis Dementia Rating Scale (Mattis 1976); Logical Mem. = Logical Memory subtest of the Wechsler Memory Scale - Revised (Wechsler 1987); R- WAIS = Revised Wechsler Adult Intelligence Scale (Wechsler 1981); WMS = Wechsler Memory Scale (ref. above); Randt = Randt Memory Test (Randt & Brown 1983); MMPI = Minnesota Multiphasic Personality Inventory (Hathaway & McKinley 1943); Hierarchic Dementia Scale (Cole & Dastoor 1983).

Percentages

Legend: • A1 + A2 * A3 □ A4 × A5 ◇ Maximum
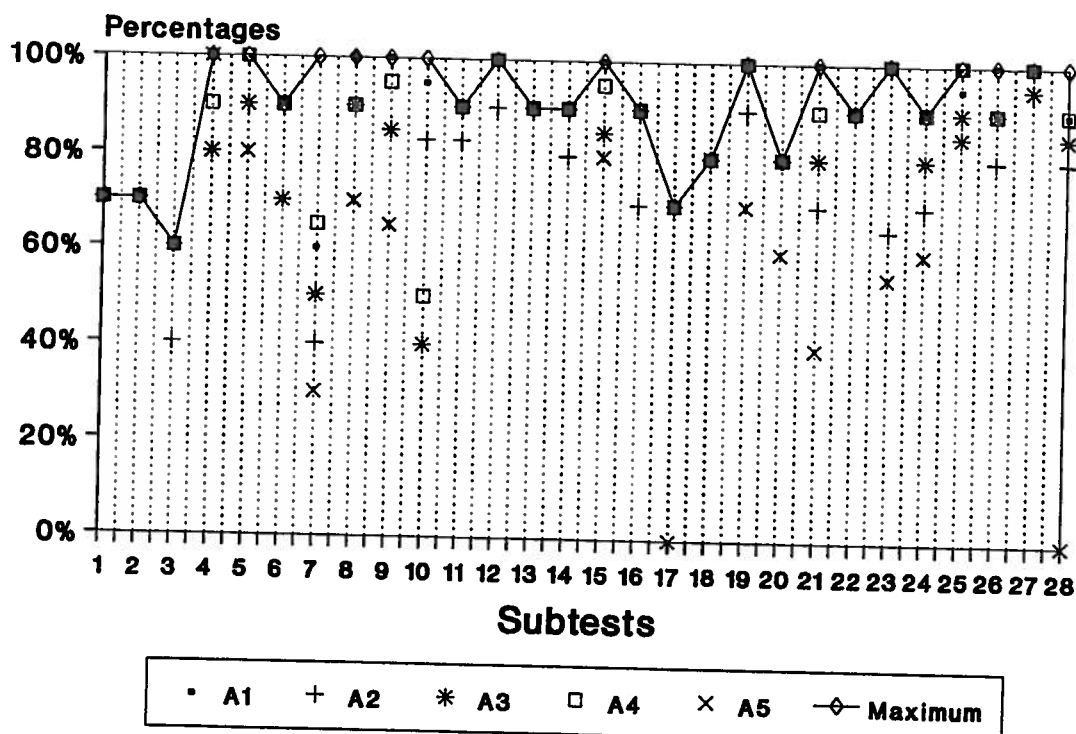
BDAE Subtests
Description

Subtest 1: Artic. Rating
Subtest 2: Phrase Length
Subtest 3: Melodic Line
Subtest 4: Word Discrim.
Subtest 5: Body-Part Ident.
Subtest 6: Commands
Subtest 7: Complex Idea. Mat.
Subtest 8: Responsive Naming
Subtest 9: Confrontation Nam.
Subtest 10: Animal Naming
Subtest 11: Word Reading
Subtest 12: Oral Sent. Reading
Subtest 13: Repetition Words
Subtest 14: High Prob. Repet.

Subtest 15: Low Prob. Repet.
Subtest 16: Automatized Seq.
Subtest 17: Symbol Discrim.
Subtest 18: Word Recognition
Subtest 19: Compr. Oral Spell.
Subtest 20: Word Pict. Match.
Subtest 21: Read. Sent./Parag.
Subtest 22: Mechanics/Writing
Subtest 23: Serial Writing
Subtest 24: Primer Level Dict.
Subtest 25: Spell. to Dict.
Subtest 26: Written Conf. Nam.
Subtest 27: Sentence - Dict.
Subtest 28: Narrative Writing

Figure 5.1.: BDAE Subtest Scores

process propositions and arrive at appropriate macropropositions (Kintsch and Van Dijk 1978; Mross 1990; Murphy 1990). Since the social worker was not familiar to the subject, interpretation of the exchanges in the conversation could not rely on special knowledge between the conversers and unknown to the experimenter. Hence, any specific knowledge shared by the subject was as novel to the conversational partner as to the experimenter.

5.2. CONVERSATIONS - COLLECTION OF DATA
5.2.1 RECORDINGS

All subjects were videotaped in their own homes using a Sony Handicam video 8 camera Model no. CCD-F40 fitted on a tripod. In addition, the conversation was recorded on a Sony two-channel cassette recorder Model No. TC-D5M using two Sony F-25 table-top microphones. No differences were expected due to obvious video recording. Wiemann (1981) found no statistical difference in behavioral indices of relaxation/anxiety or responsiveness due to obviousness of video recording procedures.

Subjects were asked to converse about any topic they desired for one full hour. All conversations were between the subject and the social worker, who was the same for all tapings. In order to allow for proper analysis of subjects' skills in topic shifting, there were no restrictions on the topics discussed. Subjects were asked to allow their conversation to be as 'natural' as possible. Since the interest was in topic shifting behavior, it was important that topic initiating not be biased towards the social worker as in a topic directed interview --- this would have been self defeating. Restricting what is said in a conversation is counter productive to studying face to face interactions (Holtgraves, Srull, & Socall 1989; Levinson 1984; Murphy 1990). For this reason, neither the subjects nor the social worker were aware of the specific interest of the study, namely Topic Shifts.

5.2.2 TRANSCRIPTIONS

Transcriptions of the conversations were made for each subject/social worker pair. They were not transcribed phonetically since the present study was not interested in any phonetic or nonverbal skills analysis. The first and last 15

minutes of the hour-long conversation were omitted from transcription in order to minimize any possible initial effects of video recording and to eliminate the openings/closings of the conversations. Only the middle 30 minutes of conversation were transcribed. A speaker's TURN ceased the moment the other conversational partner began to speak. In the majority of cases, conversers speak one at a time and therefore do not overlap (Sacks, Schegloff & Jefferson 1974).

Following transcription, the transcript was reviewed with the videotape, in order to insert any descriptive comments where necessary. For example, comments included occurrences in the environment (eg: a telephone ringing), or impressions of the speaker's intention (eg: "Uhm-uhm" meaning "yes" vs. "Uhm-uhm" used as conversational support). Interpretation of these was made based on supralinguistic/nonverbal information (eg: facial expression, intonation). They were again reviewed with two other speech/language pathologists during analysis, whenever the interpretation was doubted. Turns were numbered in sequence and the speaker was identified by her initials.

5.3. CONVERSATIONS - ANALYSIS
5.3.1. TOPIC UNITS

Each turn was evaluated in terms of its relation to the *TOPIC*. A *TOPIC* was defined as the macroproposition of the exchange as interpreted by the analyzers; the most common semantic/pragmatic node. One will recall that "topic" was shown to be easily identifiable (Planalp & Tracy 1980) and, in fact, identifying the topic was very rarely a problem among the three speech/language pathologists doing the analyses.

The major unit of analysis was the *TOPIC UNIT* which is a set of continuous utterances appearing to relate to the same topic without being separated by introduction or renewal of another topic or of a shift in turn. A *TOPIC UNIT* can be considered to be one of three things: a topic maintenance, a topic shift, or one may be unable to determine what the person is saying and therefore unable to classify that unit as either a shift or maintenance (see Table V.4.; global categories).

The author and two other speech/language pathologists arrived at a consensus in the categorization of topic units using the following operational definitions and categories (see Table V.4.).

The three analyzers had surprisingly little difficulty arriving at a consensus for the classification of topic units. In general, analyzers expressed more difficulty in classifying the conversations with the normal elderly. It was felt that the finesse with which the normal subjects shifted topics made it difficult to determine where precisely the shift had occurred. This was particularly true in coding *Topic Shading*. Brenner and Fujiki (1984) also expressed having the most difficulty in coding this category. The presence of the *Topic Shade* was not often questioned; its location was. *Global Dimension, Place of Shift, Type of Shift* and *Context* were rarely problematic. *Reason for Shift* was a little more difficult but often debate was between only two subcategories. Viewing the videotape usually helped in these instances. The experimenter was most familiar with the context in which the conversations had occurred and was available to help include this information. It was extremely important that the analyzers be capable of interpreting the context so that it could best approximate S.W.'s interpretation of her conversational partners' comments.

5.3.2. GLOBAL CATEGORIZATION: OPERATIONAL DEFINITIONS
TOPIC MAINTENANCE:

> "*Acts that maintain or terminate an established topic..... Once a topic has the floor, all acts that fall within the range of the conversation occupied by that topic may be coded as contributing to the maintenance of the topic*" (Crow 1983, pp. 140-141).

Maintenance of topic was not categorized in detail since it was not the focus of this research, aside from giving a global dimension. A distinction was made between those maintenances that contributed semantic information and those that did not. A *topic unit* judged to repeat or add some semantic information to the conversation was called a *SEMANTIC* Topic Maintenance. A *topic unit* judged as not contributing any semantic information to the conversation (eg: Uhm-uhm) was

CATEGORY	SUBCATEGORIES
GLOBAL	Topic Maintenance Semantic Nonsemantic Topic Shift Undetermined

TOPIC SHIFTS ONLY

PLACE OF SHIFT	Within Turn (WT) Across Turn (AT)
TYPE OF SHIFT	Topic Initiation (TI) Topic Shading (TS) Renewal (R) Insert (I) Unexpected (UT) Undetermined (UD)
REASON FOR SHIFT	End of Topic (ET) Decreased Comprehension (DC) Fail to Continue (FC) Outside Stimulus (OS) Repetition of Idea (RI) Anecdotal (A) Unknown (U)
CONTEXT	Text (T) Environment (E) Specific Knowledge (SK) General Knowledge (GK) Unknown (U)

Table V.4.: Topic Shift Categories

called a *NONSEMANTIC* Topic Maintenance. This latter category was used mostly as conversational supports and were similar to what Goodenough and Weiner (1978) referred to as 'passing moves'.

Aside from Topic *Maintenance*, a *Topic Unit* could be judged as a Topic *Shift* or *Undetermined*. A Topic Unit judged as not continuing the immediately preceding identified topic was considered a *Topic Shift*. Thirdly, if it was uncertain whether a *Topic Unit* maintained or shifted the previous topic, the unit was identified as *Undetermined*.

5.3.3. CLASSIFICATION OF TOPIC SHIFTS: OPERATIONAL DEFINITIONS

Further classification was done on Topic *Shifts* only. The following classificatory system was primarily modeled on Crow (1983) with information extracted from Keenan & Schieffelin (1976), Planalp & Tracy (1980) and Van Dijk (1977) (Table V.4.). Each Topic Shift was coded for place, type, reason for shift and the context to which it related.

5.3.3.1. PLACE OF SHIFT

a. Within Turn:

a topic shift which occurred in the same turn as the preceding topic.

b. Across Turn:

a topic shift which occurred across the turn boundaries.

5.3.3.2. TYPE OF SHIFT

a. Topic Initiation:

"... an attempt to introduce a new topic either at the beginning of a conversation, after a prior topic has been apparently terminated or after a period of nontopical talk ("drift") or silence" (Crow 1983, pp 141)

b. Topic Shading:

> "... *introduces a new topic by first establishing its relevance to or connection with the topic that has been on the floor*" (Crow 1983, pp 142). Establishing its relevance could be done through repetition of a referent, pronominal referencing or using connecting phrases like "Speaking of.....".

c. Renewal:

> "*A shift back to an earlier topic after one or more other topics or topic-shifting attempts have intervened...*" (Crow 1983, pp 144) These may or may not be marked (eg: Getting back to ....).

d. Insert:

> "*An (often) abrupt shift that does not succeed in gaining the topical floor*" (Crow 1983, p 148). These most often occurred within a turn. The shift was often tangential to the earlier topic but not marked as in TOPIC SHADING. In an "insert" the impression was that the speakers did not want to drop the last topic discussed.

e. Unexpected:

> "*An abrupt shift that succeeds in gaining the topical floor.*" (Crow 1983, pp 146). These might have occurred during an unexpected occurrence in the environment (eg: a telephone ringing).

f. Undetermined:

> A topic shift in which it was evident that the speaker had switched topics but it was difficult to determine what the new topic was.

Topic Shading and *Topic Initiation* were seen as continuous (Keenan & Schieffelin 1976) or coherent (Crow 1983), whereas the other types of topic shifts (eg: *Renewal, Unexpected...*) were seen as discontinuous (Keenan & Schieffelin 1976) or noncoherent (Crow 1983).

5.3.3.3. REASON FOR SHIFT

The classification of the reasons for shifting topics was far from exhaustive and the hardest to determine. In this category, it was hoped that there would be superficial exploration of the intentions of the speakers as they shifted topics.

Although the present research was not interested in directly examining nonverbal communication, these cues helped in interpreting a speaker's possible motivation for shifting topics. For example, a look of puzzlement may indicate a difficulty in comprehending what had just been said.

Some of these categories were almost all-inclusive. For instance, in *Decreased Comprehension* there was no distinction between problems with the delivery of the message and the identification of a referent - yet, these are totally different entities. It was felt that more detailed categorization would be even more difficult for analyzers to determine, whereas a general difficulty in comprehending was significantly different from other categories to be operational. Categories for classifying "Reason for Shift" were:

a. End of Topic:

The topic shift had occurred because it was obvious that the speakers had nothing more to say about the previous topic. This might be signaled by a series of 'passing' turns during which no more semantic information had been added, or following a period of silence.

b. Decreased Comprehension:

It appeared from the observation of the videotape that the speaker had not fully comprehended what the other speaker had said and hence decided to change the topic. This might occur because the listener was not paying attention or because there was difficulty in identifying the referent or in understanding the gist of what was said (Keenan & Schieffelin 1976). Decreased comprehension could also occur when there was difficulty in the delivery of the message.

c. Failure to Continue:

A member of the dyad decided or could not continue a current unfinished topic forcing the other member of the dyad to change the topic.

d. Outside Event:

A topic shift had occurred because of something that happened in the immediate environment (eg: a telephone ringing) or an object/person in the immediate environment had triggered a new topic of conversation.

e. Repetition of an Idea:

A topic shift had occurred because of a need to repeat a previously mentioned idea.

f. Anecdotal:

A topic shift had occurred because of a desire to share a short story, usually biographical in nature.

g. Undetermined:

The reason for the topic shift did not appear to fit into any of the categories mentioned above.

5.3.3.4. RELATION TO CONTEXT

The important role of context in conversation was stressed in the review of the literature. In categorizing the type of context to which a shift related, it was hoped that there would be some notion of the type of knowledge used in these conversations. For example, were subjects always shifting to information relating to the outside environment or did they relate more to specific knowledge that was shared? The categories used for context were as follows:

a. Text:

The topic shift related to something that was previously said in the conversation - knowledge that had already been shared.

b. Environment:

The topic shift related to an object or event in the immediate environment (eg: the table cloth, someone who had just dropped something, etc.)

c. Specific Knowledge:

The topic shift related to knowledge within the speaker(s)' repertoire (eg: personal experiences).

d. General Knowledge:

The topic shift related to knowledge assumed to be within the realm of the general public's repertoire (eg: world events).

e. Unknown:

The analyzers were unable to determine what the topic shift related to.

5.3.4. COMPUTER-BASED DATA ANALYSIS

The experimenter and two other speech/language pathologists arrived at a consensus in coding each topic unit into the aforementioned categories for the 30 minutes of conversation. All data was later stored in a computerized database (Advanced Revelation 1987). Through database queries, three profiles were extracted:

(1) **GENERAL PROFILE**, irrespective of the speaker;

    (1A) Expressed as a percentage of all productions in the conversations, including both conversers. Its aim was to give a global graphic representation of the conversation,

    (1B) Expressed as each converser's <u>contribution</u> to the conversation.

(2) **SUBJECT PROFILE**, either DAT or NE.

Expressed as a percentage of each DAT or NE subject's productions, excluding those made by the other conversational partner.

(3) **SOCIAL WORKER PROFILE**, S.W.

It was hoped that by analyzing the social worker's conversational behavior, some insight might be obtained into possible differences normal speakers may have in addressing subjects with DAT vs NE.

Data was expressed as a percentage of S.W.'s own productions as she was speaking to a DAT subject or as she was speaking to a NE subject.

5.3.4.1. GENERAL PROFILE

Information from the database was organized in the following manner.

Item 1:   Number of turns in the 30 minutes of conversation

The next 3 items were expressed as both an absolute number and as a percentage of the TOTAL TURNS in the conversation both (a) for a broad analysis, irrespective

of the speaker and (b) for an analysis of the contributions, considering each speaker's productions.

Item 2.	Number of *Shifts* in the conversation

Item 3.   Number of Topic *Maintenances*
3A. Number of *Semantic* Maintenances
3B. Number of *Nonsemantic* Maintenances

Item 4.   Number of *Undetermined*

The following four items were expressed as both an absolute number and as a percentage of the TOTAL SHIFTS in the conversation both (a) for a broad analysis, irrespective of the speaker and (b) for an analysis of the contributions, considering each speaker's productions.

Item 5.   PLACE: The number of shifts produced *Within* and *Across* turn

Item 6.   TYPE: The number of shifts in each of the categories: *Topic Initiation, Topic Shading, Renewal, Insert, Unexpected, Undetermined.*

Item 7.   REASON: The number of shifts in each of the categories: *End of Topic, Decreased Comprehension, Failure to Continue, Repetition of an Idea, Anecdotal, Outside Event, Unknown.*

Item 8.   CONTEXT: The number of shifts in each of the categories: *Text, Environment, Specific Knowledge, General Knowledge, Unknown.*

5.3.4.2. SUBJECT PROFILE (DAT or NE)

The following 3 items were expressed as an absolute number and as a percentage of the TOTAL TURNS produced by the SUBJECT (either DAT or NE). This allowed the construction of an individual profile excluding the conversational partner's productions.

Item 1.   Number of *Shifts* in the conversation

Item 2.   Number of Topic *Maintenances*
2A. Number of *Semantic* Maintenances
2B. Number of *Nonsemantic* Maintenances

Item 3.   Number of *Undetermined*

The following categories were expressed as an absolute number and as a percentage of the TOTAL SHIFTS produced by each subject (yielding an individual profile).

Item 4.   PLACE: The number of shifts produced *Within* or *Across* turn

Item 5.   TYPE: The number of shifts in each of the categories: *Topic Initiation, Topic Shading, Renewal, Insert, Unexpected, Undetermined.*

Item 6.   REASON: The number of shifts in each of the categories: *End of Topic, Decreased Comprehension, Failure to Continue, Repetition of an Idea, Anecdotal, Outside Event, Unknown*

Item 7.   CONTEXT: The number of shifts in each of the categories: *Text, Environment, Specific Knowledge, General Knowledge, Unknown.*

5.3.4.3. SOCIAL WORKER'S PROFILE

The social worker's profile was developed for each of the 10 conversations using the same analysis as for the "Subject Profile" above. Data was expressed as absolute numbers and percentages of TURNS/SHIFTS produced by S.W. in that conversation.

5.3.4.4. SUMMARY - DATA ANALYSIS

In summary, then, information was gathered to produce (see Data Summary Sheet, Appendix A)

1. a *General Profile* of the conversation, including each conversational partner's contribution to the conversation. Contribution data was extracted from the *Subject* and *S.W. Profiles*.

2. a *Subject Profile* showing the relative distribution of each of the categories for each DAT and NE subject's productions, excluding the conversational partner.

3. a *Social Worker Profile* showing the relative distribution of each of the categories for S.W.'s productions as she was speaking with a DAT versus as she was speaking with a NE subject.

5.3.4.5. METHOD OF INTERPRETATION

All data was reproduced in a table and graphically represented using bar graphs (see Appendices B through G). Interpretation of the data was done on visual inspection alone. It was felt that the use of statistics was not appropriate for the following reasons.

First of all, the use of statistics with single subjects is usually reserved for single subject designs, not case studies (Hegde 1987; Kazdin 1984; McReynolds and Kearns 1983). In single subject designs there is experimental control of the variables, as in the repeated measure of a behaviour over time (typical A-B-A or A-B-A-B designs). In case studies, there is only an "*ex post facto analysis of factors that may have been responsible for an effect ... ... single subject designs* [on the other hand] *attempt to establish cause-effect relations*" (p. 218 Hegde 1987). The present study involved description of the topic shifting profiles that occurred in the subjects' discourse. It was hoped, based on theoretical knowledge, that topic shifting profiles would be different in subjects known to have incoherent discourse. No attempt was made to manipulate the experimental variables and no cause-effect relationships were sought. The investigation was designed as a multiple case study; not a single subject design.

Secondly, statistics force us to suppress individual variability. Tests of significance allow us to "*infer whether uncontrolled variables contributed to an experimental outcome*" (p. 126 McReynolds and Kearns 1983). Variations are treated as "errors" in inferential statistics. The aim of the present study was to describe this individual variability and hypothesize as to the possible functional relationships which may contribute to the different topic shifting profiles. It was therefore not necessary to minimize the variability but rather to describe it. No homogeneity in the two types of subjects (DAT and NE) could be assumed.

Thirdly, statistics are used to allow generalization to the subject population. The majority of statistical techniques are based on random theory (Hegde 1987).

There was no attempt, in the present study, to sample subjects which were representative of the patient population. Furthermore, because homogeneity of cognitive deficits in both DAT and NE subjects and homogeneity of conversational skills could not be assumed, it was not possible to devise a properly randomized sample.

A last reason for not using statistics in the present study relates to the size of the observable differences. Statistics are necessary to look at subtle differences either between groups or within a subject's performance over time. Since no previous studies had attempted to describe topic shifting profiles in these populations, only large differences in profiles were interesting. Such large differences are best observed through visual analysis (Hegde 1987; Kazdin 1984; McReynolds and Kearns 1983). When visual analysis yields equivocal results, then statistics can be used to identify more subtle differences. The question remains as to whether or not the subtle differences are pertinent in this matter. Clinically, it is the marked, large visual differences which are particularly important. If the differences are not large enough, they may not be clinically relevant. One may be too tempted to focus on minute statistical differences which appeared inconclusive upon visual analysis and which may, in fact, be clinically irrelevant.

CHAPTER 6

RESULTS

Since the present study did not use a group design, only large differences could be considered of any interest and these are often best examined through visual analysis (Hegde 1987; McReynolds & Kearns 1983). Bar graphs of the results in each of the categories mentioned in chapter 5 were included in Appendices B through G. Figures 6.*.A. gave a visual representation of the *General Profile* for all pairs of conversations (Figure 6.*.A.1.) as well as the relative contributions of each converser (Figures 6.*.A.2. & 6.*.A.3.). Figures 6.*.B. gave a visual representation of the individual *Subject Profiles* (Figures 6.*.B.1.) and *Social Worker Profiles* (Figures 6.*.B.2.), irrespective of the conversational partner. The raw numbers used in the 6.*.B. figures were the same as those in the contribution figures except that the percentage was expressed by reference to the conversers' own productions. All raw data was tabulated in the annexed tables (Tables VI.*.).

Data for the conversation with A1 was slightly altered. The conversation was marked in large extent by the use of a family photo album. Since this would bias all results in terms of being highly relevant to external stimuli (i.e. the family album), all turns in which the TOPIC had been determined as "PICTURES" were removed from the analysis and percentages were taken from the remaining turns. This did not exclude conversation about what was in the pictures. For instance, if the conversers commented on the quality or beauty of the pictures themselves, these turns were removed. If comments pertained to what was happening in the picture, the turn was kept for analysis. As results show, despite these precautions, the A1 conversation was proportionately higher in terms of topic shifts relating to *outside stimuli*. Other conversations were also sensitive to outside stimuli. For instance, A4 showed S.W. a quilt she had made, N5 talked a lot about the plants that were facing the conversers, A3 had a book her husband received upon his retirement. These instances were comparatively short lived. It was felt that the shifts in the conversation with A1 could be significantly influenced by the picture album and so precautions were taken.

In all figures, full bars (■) referred to data extracted from the social worker (S.W.) and normal elderly (NE) conversations, empty bars (⊓) referred to data extracted from S.W. and DAT conversations, all horizontal lines (▤) referred to data from the NE subjects alone, vertical lines (⦀) referred to data from DAT subjects alone and all grids (⊠ ▦) referred to data from S.W. taken alone.

Results that appeared visually consistent (i.e. occurring in 4 out of 5 or in all 5 pairs of conversations) were described for each figure. Pre-suppositions of the direction of results were postulated prior to each section. In the remainder of the chapter, Dementia of the Alzheimer Type was represented by DAT, NE represented the normal elderly and S.W. represented the social worker.

6.1. GLOBAL DIMENSION

All graphs and tables for *Global Dimension* can be found in Appendix B.

6.1.1. PERCENTAGE OF SHIFTS

The review of the literature suggested that there would be more topic shifts in conversations with DAT subjects than in conversations with normal elderly. Hence, in the present study one would assume that there would be proportionately more shifts in the DAT conversations.

6.1.1.1. GENERAL ANALYSIS - Shifts

A visual analysis of Figure 6.1.A. did not show a trend in the direction of increased percentages of *shifts* in the DAT conversations. The differences between the DAT and NE conversations were not large or consistent in the percentage of *shifts* in each of the dialogues (see Figure 6.1.A.1.). Likewise, Figures 6.1.A.2. and 6.1.A.3. showed a relative sharing in each converser's contribution to the percentage of *shifts*.

6.1.1.2. INDIVIDUAL ANALYSIS - Shifts

When each converser was taken individually as a function of their own productions (Figure 6.1.B), the NE and DAT subjects appeared to perform similarly in their percentage of *shifts* (Figure 6.1.B.1.). Although S.W.'s profile (Figure 6.1.B.2.) showed a small tendancy in producing more *shifts* when speaking to a subject with DAT than with a NE, these differences were negligible.

6.1.1.3. SUMMARY - SHIFTS

Using a very rudimentary way of determining topic shifting, there did not appear, in these samples of conversation, to be proportionately more shifts in the DAT conversations.

6.1.2. PERCENTAGE OF "MAINTENANCE"

The literature pointed to a disturbance in DAT subjects' ability to maintain a topic of conversation. There should, therefore, be comparably more topic maintenance turns in the conversations with the NE.

6.1.2.1. GENERAL ANALYSIS - Maintenance

The study of topic *maintenance* was not the purpose of the current investigation and so the method of analysis used was elementary. No large dissimilarities were found on visual analysis of Figure 6.2.A. No contrasts were evident either for percentage of *maintenances* in the two types of conversations (with DAT versus with NE) or in the contributions each of the conversers made during the interaction (Figures 6.2.A.2. and 6.2.A.3.).

6.1.2.2. INDIVIDUAL ANALYSIS - Maintenance

Again, no large distinguishing tendencies in percentage of *maintenances* were discernible when each converser was analyzed in her own right (Figures 6.2.B.1. and 6.2.B.2.)

6.1.2.3. SUMMARY - MAINTENANCE

Maintenance of topic, in its most superficial level of analysis, was not shown to differ drastically in dialogues between S.W. and a DAT subject as compared to dialogues between S.W. and a NE subject.

6.1.3. PERCENTAGE OF "UNDETERMINED"

The percentage of turns which could not be classified as either a shift or a maintenance was insignificant (Figure 6.3.A.1.) and not worthy of further analysis.

6.1.4. PERCENTAGE OF "SEMANTIC MAINTENANCE"

Several factors would lead to the supposition that DAT conversations would display fewer percentages of *semantic maintenance*. The literature reported an increase in elaboration as one ages. The semantic deficit found in DAT subjects and the studies denoting poor informational content and a lack of elaboration of topic, also support the notion of decreased percentages of *semantic maintenance* in these subjects.

6.1.4.1. GENERAL ANALYSIS - Semantic Maintenance

Figure 6.4.A.1. demonstrated only one pair of conversations showing this trend (SW+N5 versus SW+A5) with one pair (SW+N3 versus SW+A3) showing the opposite trend. All other sets of conversations showed minimal perceivable differences. An analysis of each converser's contribution to these percentages showed no consistent pattern (Figures 6.4.A.2. & 6.4.A.3.).

6.1.4.2. INDIVIDUAL ANALYSIS - Semantic Maintenance

The individual profiles of each converser, again, did not show any consistent trends, as shown in Figure 6.4.B.

6.1.4.3. SUMMARY - SEMANTIC MAINTENANCE

No hypotheses could be drawn regarding the percentage of *semantic maintenances* in DAT and NE conversations. It was very likely that the method

used for determining *semantic maintenance* in the present study was not tapping semantics at all and could not capture subjects' abilities to maintain a topic.

6.1.5. PERCENTAGE OF "NONSEMANTIC MAINTENANCE"

The bipartite nature of topic *maintenances* into either *semantic* or *nonsemantic* led to mirrored results. Examination of the subjects' percentage of *nonsemantic maintenance* yielded the opposite results of those found in *semantic maintenance* (Figures 6.5.A. & 6.5.B.). As in the previous section, no consistent pattern could be noted.

6.1.6. SUMMARY - GLOBAL DIMENSION

A broad investigation such as the one used in the global dimension section of this study failed to elicit any strong tendencies in the percentage of *shifts* and topic *maintenances* in the conversations of DAT and NE subjects. The hypotheses set forth in the literature regarding DAT subjects' inabilities to maintain a topic of conversation and to demonstrate an increase in topic shifts, did not gain any support from the preliminary analyses of these cases. Further visual analysis of graphs depicting conversers' involvement for each of the conversations did not demonstrate any striking differences between the two types of subjects. The following sections will explore more closely the topic shifting behavior per se.

6.2. PLACE OF SHIFT

If DAT subjects have more turns and fewer utterances per turn, as documented in the literature, the odds that these subjects' topic shifts occur proportionately more *across turn* than *within turn* should be higher. All graphs and tables for *Place of Shift* can be found in Appendix C.

6.2.1. PERCENTAGE OF SHIFTS MADE "WITHIN TURN"
6.2.1.1. GENERAL ANALYSIS - Within Turn

Although three sets of conversations showed a trend in the direction hypothesized above, the other two sets of conversations did not (Figure 6.6.A.1.). Careful scrutiny of the relative involvement of each participant yielded some

interesting tendencies. Whereas in the NE conversations (Figure 6.6.A.2.), the contribution to *within turn* shifts was mostly due to subject NE and not to S.W., this was not necessarily the case with the DAT subjects (Figure 6.6.A.3.).

6.2.1.2. INDIVIDUAL ANALYSIS - Within Turn

No consistent trends were noted when each of the conversers was analyzed individually (Figure 6.6.B.).

6.2.1.3. SUMMARY - WITHIN TURN

The only remotely interesting result from the data on shifts produced *within turn* was that the normal elderly appeared to contribute to the majority of these shifts in the NE conversations whereas this was not the case with the DAT subjects in the DAT conversations.

6.2.2. PERCENTAGE OF SHIFTS MADE "ACROSS TURN"
6.2.2.1. GENERAL ANALYSIS - Across Turn

As with the *within turn* shifts, no consistent results were found with *across turn* shifts (Figure 6.7.A.1.). A closer look at the contribution of the conversers (Figures 6.7.A.2. and 6.7.A.3.) showed that, in the majority of cases, S.W.'s involvement prevailed. In no case, be it the NE or the DAT conversations, did the subject assume the greater portion of the *across turn* shifts.

6.2.2.2. INDIVIDUAL ANALYSIS - Across Turn

Visual analysis of each of the subject's and each S.W. profile was inconclusive (Figure 6.7.B.). No consistent trend was represented.

6.2.2.3. SUMMARY - ACROSS TURN SHIFTS

The only point of interest in the percentage of shifts made *across turn* was the fact that in all pairs of conversations, be it NE or DAT, S.W. contributed to the majority of topic shifts in this location.

6.2.3. SUMMARY - PLACE OF SHIFT

In conclusion, examination of the technical place at which a shift occurred was not terribly revealing. The only hint at a possible difference occurred in the participants' contribution to the total percentage of shifts produced in one location or another. In conversations with the NE, S.W. dominated the percentage of *Across turn* shifts, whereas the NE dominated the percentage of *Within turn* shifts. In conversations with the DAT, the same pattern was found *across turn* but no consistency was found *within turn.*

6.3. TYPE OF SHIFT

All graphs and tables for *Type of Shift* can be found in Appendix D.

6.3.1. PERCENTAGE OF "TOPIC INITIATION" SHIFTS

One study (Hutchinson & Jensen 1980) showed that DAT subjects initiated topics more. It was not clear in that study whether or not initiation of a topic implied the termination of a previous topic, as it did in the present investigation. If one considers that DAT subjects make inappropriate topic shifts, then *topic initiation* as defined here, would be a less likely type of shift for DAT conversers.

6.3.1.1. GENERAL ANALYSIS - Topic Initiation

Visual analysis of Figure 6.8.A.1. showed that in all five pairs of conversations, the conversations with the DAT subjects had a <u>greater</u> percentage of *topic initiations*. However, it is clear that in the DAT conversations, S.W. was the one making the majority of the *Topic Initiations* (Figure 6.8.A.3.). The only exception is the conversation with subject A1. This subject has since been reevaluated and diagnosed as having Multi Infarct Dementia. Her results were occasionally different from the other 4 DAT subjects in this and other categories. The relative contributions in the NE conversations (Figure 6.8.A.2.), showed a greater balance within the conversational pair.

6.3.1.2. INDIVIDUAL ANALYSIS - Topic Initiation

Inspection of Figure 6.8.B.1. showed no consistent trend when each of the subjects was taken individually. The S.W.'s profile (Figure 6.8.B.2.) again demonstrated that S.W. spent a large proportion of her shifts in initiation when she was speaking with a DAT subject, but less so when she was speaking with a NE subject (with the exception of subject A1).

6.3.1.3. SUMMARY - TOPIC INITIATION

Several points must be retained in relation to the above results. There were proportionately more *Topic Initiations* in the conversations with the DAT subjects than in the conversations with the NE subjects and these were mostly due to S.W. Further analysis showed that, independent of the conversational partner, S.W. performed differently with the DAT subjects by initiating proportionately more topics than with the NE. Lastly, subject A1 performed differently from all other DAT subjects, appearing more "normal" in her proportion of topic initiations.

6.3.2. PERCENTAGE OF "TOPIC SHADING" SHIFTS

Topic shading requires that the converser hold the previous topic in memory and relate the new topic to the old one. It assumes an inherent ability to be coherent. Based on knowledge of DAT subjects' memory difficulties and the theories postulated regarding the use of memory in discourse, and based on literature reporting an increase in inappropriate topic shifts in these patients, one might expect DAT subjects to tend to have proportionately lower percentages of *topic shading* shifts.

6.3.2.1. GENERAL ANALYSIS - Topic Shading

In Figure 6.9.A., not only was this pattern obvious in four of the five pairs of conversations (Figure 6.9.A.1.), but the *topic shading* that did exist in the DAT conversations were mostly S.W.'s (Figure 6.9.A.3.). Subject A4 was the only subject who did not show this pattern.

6.3.2.2. INDIVIDUAL ANALYSIS - Topic Shading

When taken individually, all cases (except the pair N4/A4), tended to produce proportionately more *topic shading* than the DAT (Figure 6.9.B.1.) cases. This trend was not as consistent in S.W.'s style, although it did appear that S.W. tended to produce more *topic shading* when speaking with the NE than when speaking with the DAT subject (Figure 6.9.B.2.).

6.3.2.3. SUMMARY - TOPIC SHADING

The data on *topic shading* shifts was interesting enough to warrant further investigation. The tendency observed in the graphic representations would allow one to further suspect that *topic shading* is a difficult phenomenon for DAT subjects. Not only were there proportionately less *topic shading* shifts in the DAT conversations but the subjects, when taken individually, were less likely to produce this type of shift.

6.3.3. PERCENTAGE OF "RENEWAL" TOPIC SHIFTS

The popular conception that victims of DAT repeat the same stories and topics, leads one to believe that these subjects would tend to produce a larger proportion of *renewal* shifts. In addition, the higher proportion of intrusions and perseverations reported in the literature amongst these subjects would confirm these impressions.

6.3.3.1. GENERAL ANALYSIS - Renewal

Contrary to this expectation, NE subjects in the present investigation appeared to have a greater proportion of *renewal* type shifts (Figure 6.10.A.1.), with the exception of the N5/A5 pair. In terms of contribution, S.W. contributed as much to the *renewal* type of shifts as the NE subject (Figure 6.10.A.2.). This was not the case with N3. During the conversation with N3, S.W. was stressing a point that she wanted N3 to comprehend. Hence, S.W. was often renewing the topic to emphasize this same point.

In 3 of the 5 DAT conversations (Figure 6.10.A.3), S.W. contributed to the majority of the *renewals*.

6.3.3.2. INDIVIDUAL ANALYSIS - Renewal

Visual inspection of Figures 6.10.B.1. and 6.10.B.2. showed no consistent trends in percentage of *renewal* type shifts when conversers were analyzed irrespective of their partner.

6.3.3.3. SUMMARY - RENEWAL

Contrary to expectations, there were proportionately more *renewals* in the NE conversations, with contribution being evenly distributed. Nothing remarkable was noted with the DAT conversations.

6.3.4. PERCENTAGE OF "INSERT" SHIFTS

An *insert*, as defined in the present study, is a momentary, deliberate shift in topic with the intention to return to the previous topic. It assumes being able to keep the previous topic in memory in order to return to it. Whether DAT subjects would be able to perform such shifts is doubtful in view of their memory deficits.

6.3.4.1. GENERAL ANALYSIS - Insert

Visual inspection of Figure 6.11.A.1. showed that there was a relatively larger percentage of *inserts* in the conversations with the NE than in the conversations with the DAT subjects. This was true for all five pairs, although the difference between N3 and A3 was minimal. The majority of the *inserts* made in the NE conversations were due to S.W. (Figure 6.11.A.2.). N1 did not show this trend but N1's conversation could often be classified as a monologue filled with vivid anecdotes. The contribution in the DAT conversations showed no particular trend (Figure 6.11.A.3.).

6.3.4.2. INDIVIDUAL ANALYSIS - Insert

Even on individual analysis there were proportionately more of these *inserts* in the NE turns than in the DAT turns in four of five cases (Figure 6.11.B.1.). The opposite trend was found in the N3/A3 comparison.

There appeared to be a steady tendency across all NE conversations for S.W.'s proportional use of *insert* as a type of shift (Figure 6.11.B.2.). This difference was less pronounced in the conversation with A1 (the subject with the present diagnosis of Multi Infarct Dementia).

6.3.4.3. SUMMARY - INSERT

Several points can be held for future consideration. First, there appeared to be an inclination towards a larger proportion of *insert* shifts in conversations with NE, with the majority of these being due to S.W. Secondly, the same result was consistent upon individual analysis. Thirdly, S.W.'s profile was congruous across all five pairs in her increased use of *insert* shifts when speaking to NE.

6.3.5. PERCENTAGE OF "UNEXPECTED" SHIFTS

Inappropriate topic shifts, depending on how it is defined in the literature, may mean a higher proportion of *unexpected* shifts in DAT subjects. Compatible with this would be these subjects' higher incidence of intrusions.

6.3.5.1. GENERAL ANALYSIS - Unexpected

Figure 6.12.A.1. showed this expected inclination towards an increased proportion of *unexpected* shifts in conversations with DAT subjects. In terms of contribution, the small percentages in the NE conversations (Figure 6.12.A.2.) made these irrelevant for further analysis. On the other hand, the trend in the five DAT cases (Figure 6.12.A.3.) was clear. The DAT subjects contributed the majority of the *unexpected* shifts.

6.3.5.2. INDIVIDUAL ANALYSIS - Unexpected

Taken individually (Figure 6.12.B.1.), the DAT subjects had a proportionately larger percentage of *unexpected* shifts as compared to the NE subjects. Subject A2 had an unusually large amount of these types of shifts. She was also reported by S.W. as being the hardest to follow in conversation. S.W.'s profile (Figure 6.12.B.2.) involved too few percentages to be analyzable.

6.3.5.3. SUMMARY - UNEXPECTED

As anticipated, there were greater percentages of *unexpected* shifts in the DAT conversations, with the majority of these being produced by the DAT subjects themselves.

6.3.6. PERCENTAGE OF "UNDETERMINED" SHIFTS

Figure 6.13.A. showed that there were very few topic shifts that could not be classified into one of the above categories. This was very encouraging, as it supported the notion that these categories were easily identifiable. The percentage of *undetermined* type of shift was too insignificant to examine.

6.3.7. SUMMARY - TYPE OF SHIFT

In summary, the NE conversations had proportionately more *topic shading*, *inserts*, and *renewals* than the DAT conversations. This finding held out with the individual profiles except for *renewal* shifts. S.W. contributed to the majority of *inserts* but more even sharing was evident in the other two types.

The DAT conversations, on the other hand, showed proportionately greater percentages of *topic initiations*, although these were mostly due to S.W. and *unexpected* shifts which were mostly the DAT subjects'.

In terms of type, S.W. appeared to use proportionately more *topic initiations* with the DAT subjects and more *inserts* with the NE subjects.

6.4. REASON FOR SHIFT

Ideally, one can assume that conversational partners shift to new topics only when the previous one is finished. In reality, this is hardly the case, even for normal conversers. The next section explores, in each of the ten conversations, those reasons why a shift might have occurred. All graphs and tables for *Reason for Shift* can be found in Appendix E.

6.4.1. PERCENTAGE OF SHIFTS DUE TO "END OF TOPIC"

Shifting a topic after another one has ended, seems to be an appropriate, logical reason for shifting. In light of the literature reporting inappropriate shifts in DAT subjects, one would assume that there would tend to be a larger percentage of shifts because of *end of topic* in the NE conversations.

6.4.1.1. GENERAL ANALYSIS - "End of Topic"

Visual inspection of Figure 6.14.A.1. shows a small trend in this direction with the NE conversations demonstrating a relatively larger proportion of shifts due to *end of topic*. Although the contributions to these conversations is relatively balanced in the NE conversations (Figure 6.14.A.2.), S.W. contributed to the majority of cases in the DAT conversations (Figure 6.14.A.3.).

6.4.1.2. INDIVIDUAL ANALYSIS - "End of Topic"

Shifting the topic as a result of *end of topic* was proportionately more frequent in the NE subjects' individual profiles than in the DAT subjects' profiles (Figure 6.14. B.1.). No visually identifiable trend could be seen in S.W.'s profiles (Figure 6.14.B.2.).

6.4.1.3. SUMMARY - END OF TOPIC

In short, the data supports the expectation that the NE conversations in the present study contain proportionately more shifts due to *end of topic* than the DAT conversations. This is further supported in individual analysis. The notion that DAT subjects may not necessarily shift at the *end of topic* is further supported by

the fact that those percentages occurring in the DAT conversations were mostly due to S.W. rather than to the DAT subject herself.

6.4.2. PERCENTAGE OF SHIFTS DUE TO "DECREASED COMPREHENSION"

One may speculate that shifting a topic because of a lack of comprehension is more frequently a cause of topic shifting amongst DAT subjects, although not impossible in normal subjects. The presumption would be that the more 'aphasic' subjects, as judged by the Boston Diagnostic Aphasia Examination, would have the greatest percentage of shifts for this reason.

6.4.2.1. GENERAL ANALYSIS - "Decreased Comprehension"

Although Figure 6.15.A.1. did show some tendency in the expected direction, the differences were far from striking and the overall percentage was quite low. In addition, subjects A5 and A3, who were amongst the most 'aphasic' subjects, did not show a trend different from the other three pairs of conversations; albeit their percentages were slightly higher. Contribution analysis showed that S.W. contributed all of the few examples of *decreased comprehension* shifts in the NE conversations (Figure 6.15.A.2.). No consistent contribution was found with the DAT conversers (Figure 6.15.A.3.).

6.4.2.2. INDIVIDUAL ANALYSIS - "Decreased Comprehension"

Analysis of the subject profiles (Figure 6.15.B.1.) again showed more productions of these shifts in the DAT subjects. In addition, there were minimally more percentages of shifts due to *decreased comprehension* in subjects A3 and A5. The S.W. profile was not suitable for evaluation because of the very low percentage of shifts in this category (Figure 6.15.B.2.).

6.4.2.3. SUMMARY - DECREASED COMPREHENSION

Overall, the percentages of shifts as a result of *decreased comprehension* were minimal across all ten conversations. In both the overall analysis and the subject profiles, DAT subjects did produced more of these shifts, albeit these were

limited. The two most "aphasic" subjects (A3 and A5) showed a slightly larger percentage in this category.

6.4.3. PERCENTAGE OF SHIFTS DUE TO "FAILURE TO CONTINUE"

As defined in the present study, shifts due to so-called *failure to continue* occur because the conversational partner chose not to or was not able to continue the topic being discussed. Research findings that DAT subjects do not elaborate their topic and have more aborted phrases, allows one to speculate that there would be an increased proportion of these shifts in the DAT conversations. One could also speculate that the majority of these shifts would be due to S.W. If the DAT subject cannot continue her topic, S.W. would be in a position to change topics because of this lack of continuation.

6.4.3.1. GENERAL ANALYSIS - "Failure to Continue"

Figure 6.16.A. supported this expectation. Four out of five pairs of conversations showed a proportionately larger percentage of shifts for this reason in the DAT conversations (Figure 6.16.A.1.), with the majority of these being due to S.W. (Figure 6.16.A.3.). Once again, subject A1 (the Multi-infarct Dementia subject) showed the opposite profile. No consistent trend was shown for contributions in the NE conversations.

6.4.3.2. INDIVIDUAL ANALYSIS - "Failure to Continue"

No trend could be found in the subjects' profiles (Figure 6.16.B.1.). Nevertheless, reflecting the results in the general analysis, it was clear in four of five cases that S.W. found herself changing topic proportionately more often with the DAT subject because the topic was not being continued by her conversational partner (Figure 6.16.B.2.). Again subject A1 was excluded.

6.4.3.3. SUMMARY - FAILURE TO CONTINUE

The reason of *failure to continue* as grounds for shifting topics was more evident in the DAT conversations than in the NE conversations, as expected. In addition, as anticipated, S.W. was responsible for the majority of these shifts,

indicating that she more frequently found herself in a position to shift topics because her partner did not continue the topic. Of note, is that subject A1 ressembled the NE subjects more than the DAT subjects.

6.4.4. PERCENTAGE OF SHIFTS DUE TO "REPETITION OF AN IDEA"

The literature on language in dementia is often flooded with comments such as increased repetitiousness in DAT subjects, a higher incidence of intrusions and "ideational perseverations". Such conclusions may entice one to deduct that DAT subjects often shift topics because they repeat the same ideas over and over again.

6.4.4.1. GENERAL ANALYSIS - "Repetition of an Idea"

The notion of increased repetitiousness as a reason for topic shifting did not appear to be more prominent in conversations with DAT subjects (Figure 6.17.A.1.), using the current methodology. In three of five conversations with the NE subjects, S.W. contributed to the majority of these shifts (Figure 6.17.A.2.). In three of five cases with the DAT subjects, the DAT subject was contributing to the majority of these shifts (Figure 6.17.A.3.). Interestingly, subject A1 distinguished herself again from the remaining four DAT conversations.

6.4.4.2. INDIVIDUAL ANALYSIS - "Repetition of an Idea"

When a closer look was taken at percentages of their own productions (Figure 6.17.B.1.), a definite increased proportion of these shifts was noted in the DAT subjects' productions: again excluding subject A1. No consistent trend was found in the S.W. profiles (Figure 6.17.B.2.).

6.4.4.3. SUMMARY - REPETITION OF AN IDEA

Although it was not obvious in the overall analyses of the conversations, it was evident that there was a greater proportion of repetitiousness in the DAT subjects when their own individual profiles were examined.

6.4.5. PERCENTAGE OF SHIFTS DUE TO ANECDOTES

Anecdotes may be considered little tangential topics to the previous topic or illustrations of a previous topic. In order to illustrate a point with a small, usually autobiographical story, one needs to be able to identify the main topic (i.e. the macrostructure) and keep it in memory so that the anecdote is relevant. In light of this, one may suspect that there would be a larger proportion of *anecdotal* shifts in conversations with NE subjects. One may further presume that anecdotal shifts occurring in the DAT conversations would be due to S.W.

6.4.5.1. GENERAL ANALYSIS - "Anecdotal"

Examination of Figure 6.18.A.1. supported this premise in four of five cases, excepting subject A1 once again. The notion of these shifts being primarily due to S.W. did not, nonetheless, appear as prominent (Figure 6.18.A.3.), keeping in mind the low percentage of *anecdotal* shifts in the DAT conversations. Contribution to these shifts in the NE conversations were due to the NE subject in four of five cases (Figure 6.18.A.2.) suggesting that NE subjects had no difficulty shifting for purposes of telling an anecdote.

6.4.5.2. INDIVIDUAL ANALYSIS - "Anecdotal"

The results stated above were again reflected in terms of individual analyses of the subjects' profiles (Figure 6.18.B.1.). The NE subjects were proportionately more likely to shift a topic because of a desire to tell an anecdote than the DAT subjects. Again A1 exhibited the opposite trend.

In three of five cases, S.W. clearly shifted more often for *anecdotal* reasons in the NE conversations (Figure 6.18.B.2.).

6.4.5.3. SUMMARY - ANECDOTES

In the present investigation, the hypothesis made was supported by all subjects except subject A1. The NE showed proportionately more instances of

anecdotal shifts than the DAT subjects when analyzed both generally and individually.

6.4.6. PERCENTAGE OF SHIFTS DUE TO "OUTSIDE STIMULUS"

The expectation that DAT subjects would demonstrate a greater percentage of shifts because of a change of focus to *outside stimuli* relies on two premises. First, depending on more concrete observable phenomena may put less stress on their failing memories. Secondly, attentional difficulties may make them more distractible to outside stimuli.

6.4.6.1. GENERAL ANALYSIS - "Outside Stimulus"

The cases in the present research did not support the anticipated result (Figure 6.19.A.). Although subjects A1 and A4 show proportionately higher percentages of shifts due to *outside stimuli*, their percentages could be easily explained. A1 chose to show S.W. a family photo album during the conversation and subject A4 chose her husband's gift retirement book as something to look at during their conversation. Both of these biased the data in that topics shifted back to the content of the pictures. Hence, there were more shifts that occurred because of a desire to relate to an *outside stimulus*.

6.4.6.2. INDIVIDUAL ANALYSIS - "Outside Stimulus"

As in the above category no suppositions can be drawn based on the figures of the individual analyses (Figure 6.19.B.) because of the biases described above.

6.4.6.3. SUMMARY - OUTSIDE STIMULUS

The desire to shift a topic because of the presence of an outside stimulus was not found as a predominant occurrence in any of the sets of conversations.

6.4.7. PERCENTAGE OF SHIFTS DUE TO "UNKNOWN" REASON

Once again the reported "inappropriate" topic shifts in DAT subjects may mean a shift in topic for no apparent reason. If this is so, then DAT subject

conversations should show proportionately more of these shifts than the NE, and the contributions should be mostly theirs.

6.4.7.1. GENERAL ANALYSIS - "Unknown" Reason

No consistent trends could be visually identified on Figure 6.20.A.

6.4.7.2. INDIVIDUAL ANALYSIS - "Unknown" Reason

Individual analysis revealed some interesting results. Figure 6.20.B.1. showed a slight tendency for DAT subjects to have a larger proportion of shifts for *unknown* reason than NE subjects. Subject A2 had an unusually large proportion of her shifts for an *unknown* reason. This was reflected subjectively by S.W. who found her the most disordered in her discourse.

S.W.'s profile demonstrated (Figure 6.20.B.2.) that she shifted topics proportionately more often for no apparent reason when conversing with the NE. In hindsight, her conversations did seem a little more spontaneous with the NE subjects although she may not have been aware of this.

6.4.7.3. SUMMARY - UNKNOWN REASON

Analysis of the category of shifts for *unknown* reason was not very revealing. Although there was a slight tendency for DAT subjects to have a larger percentage of shifts with *unknown* reason, there were no obvious tendencies upon general analysis. The S.W. profile was the only one capable of showing some disposition towards a greater amount of shifts for *unknown* reason with NE subjects.

6.4.8. SUMMARY - REASON FOR SHIFT

Analyzing the reason for a shift was the hardest category to classify. It was not always easy to determine the reason for a shift which explains the greater numbers in the *unknown* category as compared to the numbers in the *undetermined* type of shift. The raters often narrowed down the choices quite quickly to two and then debated which was the most appropriate according to the definition. If no

resolution was possible, the shift was classified as *unknown*. As a result, data from this section were somewhat less representative.

In any case, a summary of the results on *Reason for Shift* is as follows. There were proportionately more shifts as a result of *end of topic* and *anecdotal* in the conversations with the NE. Both of these categories were further supported upon individual analysis. There were proportionately more shifts as a result of *decreased comprehension* and *failure to continue* in the conversations with the DAT. This was further supported in individual analysis for *decreased comprehension* but not for *failure to continue*. The latter was most often caused by S.W.'s having to change the topic because of a lack of continuation on the part of her DAT subject partner. In addition to *decreased comprehension*, individual analyses of DAT subjects' shifts as a percentage of their own productions revealed a higher percentage of *repetition of idea* and of reason *unknown*. Subject A1 distinguished herself as opposite in trend from the other four DAT subjects in many cases.

S.W.'s profile revealed an increased use of *failure to continue*, and *outside stimuli* as a reason for shifting topics with the DAT subjects. With the NE subjects, she tended to shift more as a result of an *anecdote*, *end of topic*, or to *repeat an idea*. She contributed to most of the *end of topic* shifts that occurred in the DAT conversations and to most of the *repetition of idea* shifts that occurred in the NE conversations.

6.5. RELATION TO CONTEXT

All tables and graphs for *Context* can be found in Appendix F.

6.5.1. PERCENTAGE OF SHIFTS RELATED TO "TEXT"

The ability to relate shifts to information that was already shared in the conversation would assume an ability to build a macrostructure, constantly change it and retain this information in memory. The memory difficulties assumed by DAT subjects should make this task particularly difficult.

6.5.1.1. GENERAL ANALYSIS - "Text"

There was no indication that the expectation put forth above was in fact what was occurring in the cases studied in the present investigation (Figure 6.21.A.).

6.5.1.2. INDIVIDUAL ANALYSIS - "Text"

Likewise, no consistent trends could be found when the conversers were analyzed individually (Figure 6.21.B.).

6.5.1.3. SUMMARY - TEXT

Topic shifts relating to *text* appeared as likely to occur in the DAT conversations as in the NE conversations.

6.5.2. PERCENTAGE OF SHIFTS RELATED TO "ENVIRONMENT"

As had been expected with regards to shifts due to *outside stimulus*, the assumption could be made that DAT subjects are likely to relate their topic shifts to the concrete immediate *environment*. This way any lapses of memory could be compensated by the fact that the stimulus is there.

6.5.2.1. GENERAL ANALYSIS - "Environment"

This tendency was visually evident in only three of the five cases (Figure 6.22.A.): two of which had a stimulus such as a picture album. These facts being considered, no clear tendencies could be deducted from this data.

6.5.2.2. INDIVIDUAL ANALYSIS - "Environment"

When analyzed separately, the majority of DAT subjects' profiles (4 out of 5) showed a higher percentage of topic shifts relating to the *environment* (Figure 6.22.B.1.). Again the results must be interpreted with caution since subjects A1 and A3 had visual "props" as did subject N5. In the same light, S.W. also related proportionately more often to the *environment* when speaking with the DAT subjects versus the NE subjects (Figure 6.22.B.2.).

6.5.2.3. SUMMARY - ENVIRONMENT

Some tendencies for DAT subjects to relate shifts more to the immediate *environment* were present upon individual analyses of both the *Subject* and *S.W.'s profiles*. Interpretation must be guarded because of the use of certain environmental stimuli in several conversations.

6.5.3. PERCENTAGE OF SHIFTS RELATED TO SPECIFIC KNOWLEDGE

It was difficult to develop expectations with regards to shifts related to *specific knowledge*. On the one hand, some literature reports that the normal elderly tend to talk about an interest of theirs. This would suggest that NE subjects would tend to produce shifts related to *specific knowledge*. On the other hand, DAT subjects may have more facility in speaking about some past personal experiences (*specific knowledge*) for instance, than about what has just gone on in the conversation (*text*).

6.5.3.1. GENERAL ANALYSIS - "Specific Knowledge"

In four out of five cases, there were proportionately more topic shifts relating to *specific knowledge* in the NE conversations (Figure 6.23.A.1.). N1's conversation contained many shifts related to *specific knowledge* because she spent much time discussing her experiences in the army.

In terms of contribution, distribution was overall relatively even in the NE conversations (Figure 6.23.A.2.). In the DAT conversations (Figure 6.23.A.3.), there was a slight tendency, though not convincing, for S.W. to make the majority of shifts relating to *specific knowledge*.

6.5.3.2. INDIVIDUAL ANALYSIS - "Specific Knowledge"

When taken individually, there was a larger proportion of shifts relating to *specific knowledge* among the NE subjects, with the exception of subject N2 (Figure 6.23.B.1.). No steady trend for S.W.'s performance could be discerned upon visual inspection of Figure 6.23.B.2..

6.5.3.3. SUMMARY - SPECIFIC KNOWLEDGE

Upon both general and individual analysis, the NE conversations tended to have proportionately more shifts that related to *specific knowledge*; supporting the expectation put forth earlier.

6.5.4. PERCENTAGE OF SHIFTS RELATED TO "GENERAL KNOWLEDGE"

General world knowledge can take several forms. Among them are those items kept in Semantic Memory from years gone by and those acquired on a regular basis through the media, for instance. Stored information acquired many years ago may or may not be a problem for the DAT subjects. In light of the known memory difficulties in these subjects, information that has had to be stored recently may be a problem and not be easily referred to.

6.5.4.1. GENERAL ANALYSIS - "General Knowledge"

No noticeable tendencies could be found upon inspection of the general profile (Figure 6.24.A.1.). In both the NE and the DAT conversations, S.W. contributed to the majority of shifts relating to *general knowledge* (Figures 6.24.A.2. and 6.24.A.3.).

6.5.4.2. INDIVIDUAL ANALYSIS - "General Knowledge"

As with the general analysis, no major differences were noted either on the subjects' or S.W.'s profiles (Figure 6.24.B.).

6.5.4.3. SUMMARY - GENERAL KNOWLEDGE

The present study did not distinguish between recent and "older" general knowledge and this may or may not have been helpful. In any case, no hypothesis could be drawn based on the present data. The only relevant point is that S.W. contributed to the majority of shifts relating to this context, in both cases.

6.5.5. PERCENTAGE OF SHIFTS RELATED TO CONTEXT "UNKNOWN"

Figure 6.25.A. showed that percentages for this category were too small to warrant further analysis.

6.5.6. SUMMARY - RELATION TO CONTEXT

A summary of the shifts and their relation to context revealed that the NE conversations related proportionately more to *specific knowledge* and the DAT conversations related proportionately more to *environment*. Both of these were consistent upon individual analysis. S.W. contributed to the majority of shifts relating to *general knowledge* in all conversations and she tended to refer to *environment* more when speaking to a DAT subject.

6.6. SUMMARY - RESULTS

In order to obtain a more generalized idea of trends in results, data was graphically represented for each large section (i.e. *Global Dimension, Place of Shift, Type of Shift*, etc). All of these graphs can be found in Appendix G.

On **GLOBAL DIMENSION**, the NE and DAT conversations appeared to have similar profiles (with little individual variability) with regards to the percentage of *maintenances* and topic *shifts* (Figure 6.26.A.). Both "groups" produced relatively more *maintenances* of which most were *semantic* maintenances. Individually, there was a little more variability (Figure 6.26.B.), but NE and DAT subject profiles were relatively similar. Likewise, S.W.'s profiles (Figure 6.26.C.), with respect to global dimension, was very similar when she was speaking to a NE or to a DAT subject.

Analysis of **PLACE OF SHIFT** revealed a little more individual variability in the NE conversations than in the DAT conversations (Figure 6.27.A.) with both showing the same tendency towards a larger proportion of *across turn* shifts. Whereas it was unclear whether or not the subjects individually tended to produce more *across turn* or *within turn* shifts (Figure 6.27.B.), S.W. clearly tended to produce more *across turn* shifts in both instances (Figure 6.27.C.).

The profiles for **TYPE OF SHIFT** were not as similar as they were for *Place of Shift* and *Global Dimension*. Although the individual variability did not appear immense upon visual inspection (Figure 6.28.A.), the trend in terms of

proportion of different types of shifts was dissimilar. Whereas the NE conversations tended to produce more *renewals* and *topic shadings*, the DAT conversations tended to be more evenly spread out with *renewals* and *topic initiations* predominating. Individual subject profiles gave an even clearer picture when S.W. was removed from the data (Figure 6.28.B.). NE subjects' profiles again showed predominantly *renewals* and *topic shadings*. DAT subjects' profiles showed predominantly *renewals* and *topic intiations* with *unexpected* shifts also being prevalent. While S.W. was inclined to shift topics using a *renewal* or a *topic shading* with the NE subjects (Figure 6.28.C.), she was more inclined to use *topic initiations* and *renewals* with the DAT subjects.

A general analysis of the ***REASON FOR THE SHIFT*** in the conversations (Figure 6.29.A.) showed that both types of conversations (DAT and NE) had a significantly larger amount of shifts because the *topic had ended* than any other reason. More careful scrutiny, however (Figure 6.29.B.), showed that while the NE subjects very clearly tended to shift more as a result of *end of topic* or minimally because of the desire to tell an *anecdote*, the DAT profiles showed more diffuse distribution of the reasons for shifting. In these subjects' profiles there were almost no *anecdotes* (except subject A1), more shifting for *unknown* reason, and more *repetition of an idea*. Likewise, S.W. followed these profiles (Figure 6.29.C.). Clearly, with the NE conversations, she would have a tendency to shift because of an *end of topic*. With the DAT subjects, her profile was a little more diffuse though the great majority of shifts were also because of an *end of topic*. What was different was that she was also more often forced to change a topic because of her partner's *failure to continue* the topic at hand.

Although the shifts in the NE conversations tended to relate more to a ***CONTEXT*** of *specific knowledge*, the trend in the DAT conversations was shared between *specific knowledge* and *text* (Figure 6.30.A.). This was again supported on individual analysis with the added category of *environment* for the DAT subjects (Figure 6.30.B.). S.W.'s profile was quite similar between the two "groups" in

relation to context, with the exception of relating more often to the *environment* in the DAT conversations (Figure 6.30.C.).

Several points can be extracted from these data and discussed in the following chapter.

1. There was remarkably little variation amongst the conversations of the same "group" for certain categories (eg: *Global Dimension, Type of Shift*). This was surprising in terms of the popular conception that conversational analysis is so subjective and individually variable.

2. Out of 17 suspected directions of convergence of data, 10 were confirmed with these data (3 of which were only slightly so), 5 did not have convergences in the expected direction (*shifts, maintenance, semantic maintenance, across turn, outside stimulus*) and 2 had the opposite direction (*topic initiation, renewal*) on general analysis.

3. It is possible that *topic shading, inserts,* and *anecdotes* may demand a certain finesse which may be difficult in DAT subjects since very minimal percentages or none at all were found in the DAT profiles.

4. *Unexpected* shifts were particularly frequent in the DAT profiles.

5. One subject clearly performed differently from the other four in her "group" (i.e.: subject A1).

6. S.W.'s profile was not necessarily the same when she spoke with a NE subject versus a DAT subject. Sometimes her profiles were clearly distinguishable between the two.

7. A global evaluation of *shifts* and *maintenances* was not enough in the present study to decipher any convergences of data and hence help in exploring some possible hypotheses. It was necessary to examine the nature of the shifts to discover some differences in trends.

CHAPTER 7

DISCUSSION

The present study set forth to explore in more detail different aspects of topic shifting behaviour in conversational discourse. The *Global Dimension* and *Place of Shift* categories were aimed at probing the more superficial aspects of the shifting behaviour. The *Type of Shift* categories examined the "technique" used for shifting the topic and it was hoped that with the *Reason for Shift* categories, exploration could be made of the intention for shifting. Finally the *Context* categories superficially looked at the role of knowledge and the use of context. Although few interesting results were found upon visual inspection of graphs depicting the distribution of categories in *Global Dimension* and *Place of Shift*, some differences were apparent between conversational pairs in the other categories (i.e. *Type of Shift*, *Reason for Shift* and *Context*). In addition, results portrayed a very different topic shifting profile for subject A1 in comparison to other DAT subjects. Her results will be explored in greater depth in section 7.5. below. One of the most interesting results of the present study was the observation of some type of adaptive behavior on the part of S.W. when conversing with each of the respective subjects. Her profiles were on occasion substantially different, suggesting a different approach when speaking to a DAT versus a NE subject. Discussion of these results will ensue in the following sections. With regards to the categories, only those items where all or the majority of subjects performed in a similar fashion will be addressed, thereby allowing some hypotheses to be formed about possible characteristic profiles.

7.1. GLOBAL DIMENSION/PLACE OF SHIFT

Analysis of the *Global Dimension* (i.e. percentage of *shifts, maintenance - semantic* and *nonsemantic, undetermined*) was non informative. Several reasons could be postulated for these results. First, the variance amongst the subjects may be too great; the small subject sample being incapable of minimizing this variance. The importance of choosing a case study design for this study is explored in section 7.7.5. below. A large group sample, which may have minimized the variance,

would have been methodologically inappropriate. Although not statistically proven, visual inspection of Figure 6.26.A. showed minimal variability in the proportion of *shifts* and *maintenances* in the conversations with the DAT and the NE subjects. This may put into question whether or not there indeed was a great variance in this "group".

A second reason for the above result may be due to the known heterogeneity in both DAT subjects and in NE subjects in conversation. Both of these reasons would have had similar effects on each of the results. This not being the case in all categories, it may be more plausible that the lack of consistency in the *Global Dimension* categories may be due to the fact that the categories chosen for the *Global Dimension* were perhaps too general. For instance, the *nonsemantic maintenance* grouping was equivalent to Goodenough and Weiner's (1978) "passing moves" but in the present study, no examination was made of the role these moves had in topic boundary markings.

Crow (1983) shared an operational definition of topic *maintenance* which could be useful in subsequent studies. He suggested exploring the possible links between utterances, such as, common reference, ellipsis, repetition, pronominalization and sequential implicature; a technique widely used in narrative discourse studies. Closer examination of the maintenance of meaning relationships in conversational discourse may suggest that DAT subjects maintain a topic differently from NE subjects. Perhaps the same can be said about topic *maintenance* as is said about topic *shifts*. It is not as important whether or not a subject shifts (or maintains) a topic but how.

While *Place of Shift* categories were relevant to *shifts* only and not to topic *maintenances*, it remained a very structural description of topic shifting behaviour. No interesting results with regards to these categories was found in the current exploratory study. The only exception was that S.W. produced the majority of the *Across Turn* shifts with both types of subjects. Although S.W. had clearly pointed out that she enjoyed the non-interview style of the conversation, she may have

unconsciously felt it was her "role" to ensure that the conversation continued. As a result, whenever the conversation was not active, she may have felt it was her "responsibility" to introduce a new topic by self-initiating a turn.

7.2. TYPE OF SHIFT

7.2.1. TOPIC INITIATION

Result: There was proportionately more topic initiation in the conversations with the DAT subjects but these were mostly due to S.W..

It was assumed in the results section that if *Topic Initiation* implied, as it does in this study, that a previous topic has been terminated, then this type of *Topic Initiation* would be most likely seen in the NE conversations. In the literature, DAT subjects were believed to have inappropriate topic shifts. Hence, a new topic may be initiated at an inappropriate time (ex: before the previous one is finished). Termination of a topic is determined, amongst other things, by a period of nontopical talk. In a situation where a topic is not continued by a conversational partner, there may very well be a period of so called passing moves or nontopical talk. A new topic introduced at this point would be considered a *Topic Initiation*. If the DAT subjects were assumed to be unable to continue topics, the above scenario would occur and result in a comparatively larger percentage of *Topic Initiations* in the DAT conversations with S.W. doing most of the initiation.

7.2.2. TOPIC SHADING

Result: There were proportionately more topic shadings in the conversations with the NE subjects.

Explanation of the above result requires consideration of the notion of *topic shading*. *Topic shading* demands a certain conversational "finesse". As in the Brenner and Fujiki (1984) paper, the examiners in the present investigation, had difficulty determining exactly where in the discourse the topic had shaded. This difficulty suggested that the shift of topic was done with a certain amount of skill on the part of the speaker. Brenner and Fujiki pointed out that the conversers

appeared to be using this strategy in order to shift a topic while maintaining the overall coherence in the discourse.

Topic shading may signal that the speaker is aware of the maxims of conversation and has chosen to simply notify his partner that he will violate the maxim of relevance. He makes this transition easier for the listener by providing the information necessary to link the present proposition to previously stated ones. In discourse theory terms, this would mean that the speaker is not entrusting the listener with the task of selecting the appropriate propositions to store in the short term memory buffer to await further processing. Kintsch and Van Dijk (1978), though not addressing their concerns to *topic shading* skills, explain. When processing in cycles, a speaker, not allowing the listener the task of choosing appropriate propositions, will *"begin each new sentence by repeating a crucial phrase from the old one"* (p. 368). *Topic shading* is more than just repeating a phrase from previous propositions but the above concept might be generalized to topic shifting skills. By definition *Topic Shading* explicitly relates the present, new topic to the old one. Hypothetically, DAT subjects may not (1) be aware that they should signal any violations of the maxim of relevance and/or (2) they may not have enough discursive skill to facilitate transition from one topic to the next.

Topic shading may ultimately be considered a technique used for making a "permissible" topic shift. Further exploration of this notion might focus on the types of linkages that are possible. For instance, Tracy and Moran (1983) suggested four types of *topic shadings*: script linkage, common idea linkage, meta issue linkage and procedural linkage.

7.2.3. RENEWAL

Result: There were proportionately more renewals in the NE conversations.

Initially, it was hypothesized that DAT subjects, not NE subjects, would have considerably higher proportions of *renewals*. It was thought that this would explain

the literature's frequently cited finding of increased repetitiousness in DAT individuals. The results in the present study were thus unexpected.

A possible explanation for these results may be in drawing parallels between the concepts of coreferencing/lexical cohesion and *renewals*. Appropriate referencing involves the repetition of arguments to provide cohesion between two propositions. *Renewal* of topic may provide a "thematic" cohesive device which may allow the conversers to keep the conversation on track. In this sense, a speaker could be repeating an earlier topic but unlike *topic shading*, the topic is not marked by shading nor is the earlier topic immediately preceding the new one. If this were the case, one may hypothesize that NE subjects used this technique to provide coherence whereas DAT subjects were unable to do this. The literature cited many examples of disordered referencing in DAT subjects during narrative discourse tasks. If parallels could be drawn, the above results can be partly interpreted.

7.2.4. INSERTS

Result:There were proportionately more inserts in the conversations with the NE subjects and most of these were due to S.W.

Inserts can be seen as small digressions with an intention to return to the topic at hand. Dascal and Katriel (1979) suggested that digressions, although not being related semantically, syntactically or even pragmatically to adjacent utterances, are still considered coherent. Normal conversers are capable of holding information temporarily in memory while the digression takes place so that they may return to the previous topic. If one considers *inserts* as a type of digression, then *inserts* may assume certain mnesic capabilities, unavailable to DAT subjects. In addition, S.W. may have "allowed" herself to produce a larger percentage of these *inserts* with the NE subjects. She may have assumed that her "normal" conversers had the the mnesic capabilities to hold information temporarily in memory. Further discussion of these adaptive skills follows in Section 7.6.

7.2.5. UNEXPECTED

Result: There were proportionately more unexpected shifts in the conversations with the DAT subjects and the majority were due to the DAT subjects themselves.

At first glance these results are not surprising but one must remember that *unexpected* shifts in normals are possible and not necessarily deviant. Normal conversers can usually "fill in" the missing gaps in information and keep the conversation coherent. The information required is derived from the listener's general or contextual knowledge (Kintsch & Van Dijk 1978). The difference between the DAT and NE subjects may lie in the DAT subjects' inability to maintain the flow of conversation or establish its coherence, or inability to use knowledge to fill in the missing links. This difference could then be expressed in the proportion of *unexpected* shifts rather than the existence of such shifts.

7.3. REASON FOR SHIFT

7.3.1. END OF TOPIC

Result: There were proportionately more shifts as a result of end of topic in the conversations with the NE subjects.

The literature reported a difficulty with the elaboration of topic in subjects with DAT. Full topic development, then, is more likely to occur in NE subjects. If there is to be a shift following an end of topic, it is therefore more logically probable in conversations with NE subjects.

7.3.2. DECREASED COMPREHENSION

Result: There were proportionately more shifts as a result of decreased comprehension in the conversations with the DAT subjects.

The increased proportion of shifts in DAT subjects as a result of a *decrease in comprehension* could be a result of many factors. The subjects could have had attentional problems, a difficulty in identifying the referent because of an aphasic component, a difficulty in establishing the gist of what was said or a problem with the delivery of the message (i.e. misarticualtions, low volume, etc.). It is not

surprising that DAT subjects would have more difficulties in comprehending a message. Reported papers are filled with examples of these types of problems in narrative discourse comprehension. Deductively, the same is possible in conversational discourse.

7.3.3. FAILURE TO CONTINUE

Result:There were proportionately more shifts as a result of a failure to continue the topic in conversations with the DAT subjects and the majority of these were due to S.W.

The literature suggested that DAT subjects have problems elaborating a topic of conversation. This conforms quite nicely with the reason for shift being a *failure to continue* the topic. S.W. might have had this as a more frequent reason to shift in that her partner was less likely to elaborate a topic when she was with the DAT subjects than when she was with the NE subjects.

7.3.4. REPETITION OF IDEA

Result:There were proportionately more shifts due to the repetition of an idea in the conversations with the DAT subjects.

In the section on *Type of Shift*, it was hypothesized that DAT subjects would have proportionately more *Renewals* because this would explain the repetitious nature of their discourse. In fact, the repetitiousness may be more evident in the above category where shifts occur out of a desire to *repeat* the same *ideas*. The results on *Renewals* in *Type of Shift* were hypothetically explained by drawing parallels with coreference theory. The same could not be said here since no new information is added. Shifting topics out of a sheer desire to *repeat an idea* is not especially informative and does not coincide with Clark & Haviland's (1977) notion of the given/new contract. This repetitiousness, with no additional information, is perhaps more analogous to what researchers have reported as a repetitious nature to DAT subjects' discourse. Whereas, originally, it was hypothesized that this repetitious nature would be evident in the *Type of Shift* under *Renewal*, it may be more appropriately described under the category *Repetition of Idea* in *Reason for*

Shift. The former (i.e. *Renewals*) may include the sharing of new information which may be considered more "appropriate repetitiousness" and be more comparable to coreferencing. The latter may be viewed as more incoherent since it shares no new information.

7.3.5. ANECDOTAL

Result: There was proportionately more shifts because of a desire to tell an anecdote in the conversations with the NE subjects.

Shifting a topic because of a desire to share an *anecdote* could be considered as a desire to shift in order to digress. The same reasoning for *inserts* could be applied in this case. Shifting for an *anecdote* demands that the conversational partner hold the previous information in temporary relevance while the *anecdote* is being shared. Black (1985) noted that episodes, which are likely comparable to *anecdotes*, can be viewed as *"higher cognitive units"* (p. 257), though one must admit that this is a very ambiguous concept. If *anecdotes* require "higher level cognitive" functioning, then one can logically deduct that cognitively impaired subjects would have more difficulty processing these shifts and, as a consequence, produce proportionately fewer. More discussion of these factors will follow in Section 7.8.3. below.

7.3.6. UNKNOWN REASON

Result: There were proportionately more topic shifts for unknown reason in the conversations with the DAT subjects.

There are two possibilities for explaining the larger proportion of shifts for *unknown* reason in the DAT subjects. First, the reason for shift was the hardest for the classifiers to rate. Although the subjects may have had, in their minds, a clear reason for shifting a topic, this intention was not always obvious to the classifiers. This might have been particularly troublesome with the DAT subjects, since they were a little more erratic. Secondly, the DAT subjects may in fact shift more often for *unknown* reasons. Closer inspection of the categories for *Reason for Shift* may

help in developing more appropriate reasons for why DAT subjects had proportionately more shifts for *unknown* reasons.

7.4. CONTEXT

7.4.1. ENVIRONMENT

Result: There were proportionately more shifts relating to the immediate environment in the conversations with the DAT subjects.

As mentioned previously in Chapter 6, caution must be taken in interpreting the above conclusion. The conversations with the DAT often had "props" (e.g.: a family photo album) to facilitate the conversation. This would clearly bias the results. Whether or not it was pure coincidence that there were many 'props' in these conversations or whether or not there were props <u>because</u> conversations were particularly difficult, is not clear. If it was coincidence, nothing more can be said. If the 'props' were there for a specific reason, then one could hypothesized that conversations related more to the immediate environment because of a need to do so. Kintsch (1988) pointed out that "*knowledge provides part of the context within which a discourse is interpreted*" (p 163). The DAT subjects may have needed a more concrete context in which to interpret the discourse, rather than relying on what was stored in their memories.

7.4.2. SPECIFIC KNOWLEDGE

Result: There were proportionately more topic shifts relating to specific knowledge in the conversations with the NE subjects.

The first obvious explanation for these results is that the NE have more intact Semantic Memories and/or easier access to these memories. Therefore, it would likely be easier for them to relate their shifts to the information stored within. Likewise, the known problems with Episodic Memory in DAT subjects would render relating to episodes more difficult for these subjects. This is a very superficial explanation but closer analysis of the <u>types</u> of specific knowledge used by the subjects would have offered more information on these hypotheses.

7.5. SUBJECT A1

Discussion about subject A1's performance merits special consideration. Subject A1 was unique in that the diagnosis was modified when she returned for her follow-up visit at the Memory Disorders Clinic; after her conversation had already been recorded and analyzed for the present study. Her working diagnosis is now Multi Infarct Dementia. Though she had not originally been chosen as a dissimilar subject, her topic shifting profile was often very different from the other four DAT subjects. Furthermore, S.W. subjectively stated that she noticed a difference in this subject's conversational discourse. Without being asked, S.W. commented that she felt they had had a relatively "normal" conversation, though she realized at the end of the session that A1 had functional memory problems. A1 could not remember having seen the experimenter one week previously.

Despite this, A1's topic shifting profile appeared more "normal". First, judging by A1's discourse functioning, she was probably more likely to elaborate topics. Shifting a topic because of a *failure to continue* was not a problem in the conversation with A1. In fact, on individual analysis, A1 had proportionately fewer *Failure to Continue* than her matched NE subject. Likewise, whereas the other DAT subjects shifted proportionately more often because of a need to *repeat an idea*, subject A1 did not.

Secondly, if one agrees that *inserts* and *anecdotal* shifts demand that the hearer keep information in a state of relative relevance, then A1 had little or no difficulty with this discourse skill. Although there were proportionately fewer *inserts* and shifts for *anecdotal* reasons in the DAT subjects; A1 was not obviously different from the normals in both these cases.

Thirdly, S.W. appeared to alter her profile to fit A1's communicative abilities. Although S.W. did the majority of *topic initiations* with the DAT subjects, this was not the case with A1. If the assumption that A1 was capable of elaborating topics is correct, it may have been less necessary for S.W. to intiate

most topics. Likewise, S.W. used fewer *inserts* with the DAT subjects, but not with A1. Again, S.W. might have somehow deduced that her conversational partner had the skills to hold the information temporarily.

Although A1's conversational discourse was subjectively found by S.W. to be "normal", A1 had cognitive deficits. She had been tested for over an hour by the experimenter the week previous to the recording of the conversation. The day of the recording, the subject had no recollection of having previously met the experimenter. Likewise, neuropsychological investigation confirmed a memory impairment. An impaired memory with a subjectively normal discourse raises interesting, long standing questions of the interrelationship of memory and discourse.

7.6. ADAPTATION OF S.W.

Throughout this chapter, reference has been made to S.W.'s adaptation to her conversational partner. In this section, a closer look will be taken at the role S.W. played in rendering the conversations more coherent. In some instances, her profile was remarkably different depending on whether her conversational partner was a DAT subject or a NE subject. As seen in the previous section, S.W. performed differently at times with A1 from the way she performed with the other DAT subjects.

To recapitulate the results, some of the differences in S.W.'s profile were as follows. First, she tended to produce proportionately more *shifts*, more *topic intiations*, and more often had *failure to continue* a previous topic as a reason for shifting when speaking with the DAT subjects. All of these adaptive devices could be attributable to her partners' inability to elaborate a topic and her ability to ascertain this difficulty.

Second, S.W. "allowed" herself to produce proportionately more *topic shading*, more *inserts* and shifted more often for *anecdotal* reasons when speaking with the NE subjects. As previously stated, she may have assumed that these subjects were capable of holding information in a transient state.

Third, she produced proportionately more shifts for *unknown* reasons with the NE subjects. Either the methodology used in the present study did not reflect those reasons for which the NE most commonly shifted topics or S.W., in fact, shifted topics for no apparent reason more often with the NE subjects. If the second hypothesis is correct, then one can propose that she was not being as careful during these conversations and was, in fact, being more spontaneous.

Lastly, S.W. shifted more as a result of an *outside stimulus* and related to the immediate *environment* proportionately more often when speaking with the DAT subjects than when speaking with the NE subjects. S.W. may have intuitively determined that these subjects needed the more concrete context in which to understand the conversation and therefore adapted appropriately.

Somehow, S.W. knew to adapt to the DAT subjects' difficulty in maintaining a coherent conversation. Much of conversation is based on mutual knowledge. But as Murphy (1990) stated, mutual knowledge is not simply what the partners hold as common knowledge but also what each knows about the other's knowledge. In these cases, S.W. somehow deducted that her DAT speakers were incompetent communicators (except for subject A1) and would have some difficulty following her conversation. She may have decided she needed to adapt to these subjects based on previous interactions she had had with DAT patients in her professional career. She also knew that her partners were aware that she was a competent communicator and could probably fill-in any gaps that were present in the meaning relationships.

Kintsch and Van Dijk (1978) made mention of referential coherence and how any gaps that may be found would lead to inferential processes on the part of the comprehender:

> "...*specifically, one or more propositions will be added to the text base that make it coherent*" (p.367)

In adding the 'missing propositions' to the information given by her DAT partner, S.W. was able to make irrelevant statements relevant and follow the subject's lead. When there was an unexpected shift in topic, S.W. would follow the most recent flow of conversation and drop her last topic, thereby making the patient feel as though she was contributing something significant to the conversation. She assumed communicative competence although she knew quite clearly that these subjects had difficulties. Examples of these adaptations are illustrated in Appendix H.

In the third chapter, it was noted that it is not whether an item is relevant or not that matters, but whether the listener interprets that item as being relevant (Sanders 1983). Stubbs (1983) asserted that hearers will do their utmost to allow a statement to make sense. Sanders (1983) sums up very eloquently what may be happening in S.W.'s adaptation.

> "Grice's analysis, coupled with Reichman's, indicates that it is never problematic whether the items of discourse will cohere, at least in the eye of the beholder; it is only problematic how the items of discourse will cohere, how communicators and interpreters will end up integrating the parts into a whole (with the caveat that interpreters can choose not to work at establishing coherence if they believe the communicator is incompetent on the grounds of some physical or mental flaw, or if the cost of the effort involved seems to outweigh any benefits that success could bring). In confronting this problem communicators have the option of utilizing the arsenal of devices at their disposal for exercising some control over the way in which constituent items of discourse will be integrated. If such devices are not used for this purpose, or are utilized by habit or accident, the result will not be incoherence; it will be an integration of the parts into a whole by interpreters that may be surprising, and at times even detrimental, to the communicator." (p.69)

Many interesting points are made here. The first point of interest declares that what is important is how the items in a discourse cohere. Utterances can be thought to be very bizarre until relevance to them is later found. The integration of the information into a coherent whole is done by the listener if he/she so wishes. It is reasonable to assume that S.W. worked at integrating the information and filling the missing propositions with her DAT subjects. Her increased use of *unexpected* shifts with the NE subjects may signal that she was less careful with this population, allowing them the task of making the transition to an *unexpected* shift and

deducting the meaningful relationships. The listener must infer or invent "*a situationally plausible, topically relevant motive for the communicator's having included the item...*" (Sanders 1983, p. 69). S.W. may have worked especially hard at making these inferences with the DAT subjects.

The second important point made by Sanders is that whether listeners choose to make a statement coherent or not can be influenced by whether or not they believe the communicator is competent or the effort worthwhile. S.W. gave her conversational partners the benefit of the doubt. There is evidence in some of the examples cited in Appendix H, that she believed the effort was worthwhile in making the necessary inferences to allow the conversation to remain coherent. It is also visible that she made a distinction between what she considered a competent communicator and what she did not. For instance, her profile with subject A1 would indicate that she found this subject 'more competent' than the other DAT subjects.

The third important point made in the above quote relates to the problem of not using the integration devices available to competent listeners. Sanders stated that if these devices are not used for the purpose of integration or are used by accident the conversation will not be incoherent. That is, the listener will cohere the conversation in his/her own way and assume that the integration is correct. The listener's intepretation of the message may be totally wrong and could be detrimental to the speaker. In her integration, S.W. drew her own conclusions and tried them out in conversation. If they were inappropriate, a shift may have occurred, allowing her to drop her topic.

In summary, it is quite apparent that some level of adaptation occurred in the conversations with the DAT subjects. Somehow, S.W. was capable of making a decision regarding whether or not the communicator was competent and, if judged incompetent, whether or not it was worthwhile to use strategies to render the conversation as coherent as possible.

Several interesting questions can be raised from this realization. First, how is it that S.W. was able to make these judgements? What kind of information did she derive from her conversational partner and from her previous knowledge about these speakers in order to adapt appropriately? In subsequent studies, it may be interesting to have naive listeners attend to the conversation and answer some basic questions regarding content. For example, in conversation A, could you tell me whether or not Subject A1 has a cat? This type of analysis could give us clues as to inconsistencies in meaning relationships which may exist in DAT subjects. Hence, these subjects could be violating Grice's Maxim of Quality: Be Truthful. Such violations may help a listener decide that an inference is required to fill in the missing propositions and continue the conversation.

The second question that can be raised is whether or not such adaptation is apparent with other communicatively disordered populations. For instance, it is reasonable to assume that conversational partners adapt to aphasic or dysarthric populations of subjects. The adaptations may have the same characteristics or additional ones may be used for special types of populations. One could argue that adaptational characteristics are not specific to DAT populations alone.

Lastly, are health care professionals more willing than caregivers to make the effort in using the integrative devices in order to cohere the conversation? One can hypothesize that when a member of a couple is affected by DAT, the willingness to adapt and use the necessary devices to make statements relevant, changes over time. For instance, in the beginning of the disease process, the couple may have a joint "secret plan" to hide all evidence of disorder from the outside world. In such a situation, a strong effort may be made to make irrelevant statements, relevant. As the disease progresses and slowly ruins the communicative processes within the couple, the effort necessary to continue to cohere the conversations may be too great and judged to be unworthwhile. The health care professional, not having the history of conversational interaction with the affected individual may give the subject the benefit of working at cohering the conversation. Such hypotheses could

be examined in greater detail by comparing caregivers' interactions to health care professionals' interactions at different stages of the disease.

7.7. COMMENTS ON METHODOLOGY

Because the present study was primarily exploratory in nature, attention must be given to some aspects of the methodology.

7.7.1. SUBJECT SELECTION

In subject selection, it was important to choose subjects from the same cultural background. There is convincing support for the notion that the use of language is strongly embedded in the culture (Stubbs 1983). Hymes (1968), who has written extensively on these types of issues, stressed the importance communication has for some cultures and not others. Murphy (1990) explained that conversationalists who have not learned the conventional rules of conversation in one culture may be judged as incompetent conversationalists.

Familiarity with the subject was another factor that was important in the present study and should always be considered in such investigations. The role of knowledge in the processing of discourse has been stressed repeatedly. The so-called "devices" for inferencing information is strongly influenced by the knowledge the listener has of the world in general, of the speaker in particular and of the speaker's knowledge.

In the present study, it was assumed that general world knowledge was similar to all involved (i.e.: S.W., the NE subjects, the DAT subjects, the investigator, the analyzers), since all were living in the same general area and part of the same general North American culture. Knowledge of the specific subjects and of the subjects' knowledge was largest for the investigator. Even S.W. knew less about the subjects than the investigator. The only exception to this rule was the conversation with subject N1 who had been a social worker by profession. This meant that N1 and S.W. shared profession-specific information unavailable to all

others. As it turned out, the conversation included no information which needed to be explained by either participant in this conversation.

Had the subjects' conversational partners been familiar to them, interpretation of the conversation by nonfamiliar people would have been very difficult since the chances of inferences being made based on specific knowledge was higher. The only way to deal with this problem would have been to review the videotapes with the familiar caregiver to verify the information.

In addition, familiarity, it is hypothesized, affects the number of propositions that are accepted per cycle of processing (Kintsch and Van Dijk 1978). In comprehending discourse, the propositions chosen for further processing should be diminished with increased familiarity since some of the 'missing' information can be extracted in the listener's Semantic/Episodic Memories. The probability that a proposition 'p' has been reproduced from previously stored information is higher between familiar conversational partners.

Another subject selection factor important in this study was the choice of a health care professional, such as a social worker, as a constant conversational partner. In retrospect, the adaptability information was interesting and perhaps more probable with a health care professional.

Future research might be directed at analyzing familiar partners' styles to nonfamiliar partners' styles. In addition, the topic shifting profiles in DAT subjects who have been staged for the severity of the disease may help give an indication as to the possible deterioration of these skills over time.

7.7.2. CATEGORIZATION

The categories used for topic shifting were worthwhile as a first attempt but it would be interesting to explore if they are operational in subsequent studies. The *Global Dimension* categories (i.e. percentage of *shifts*, *maintenance* - both *semantic* and *nonsemantic*, and *undetermined*) as well the *Place of Shift* (i.e. *within*, *across*

turn) were not particularly useful as defined in this investigation. Future inquiries should further explore their usefulness or modify the categories so that the definitions are more specific. The *Reason for Shift* categories may not have adequately reflected those reasons for which normal subjects shifted topics and may have represented only deviance. Further study should reconsider this classification.

Finally, a point must be made regarding the methodology used for analyzing the data in a consensus fashion. It was hypothesized, at the outset, that the novelty and subjectivity of such a classificatory system would lead to unsurmountable problems in analyzing the data. It was also thought that the experimenter's assistance was necessary to explain the context in which the conversational items were shared, since the experimenter was present for all conversations. Thus a consensus among three speech/language pathologists was judged as the most appropriate methodology.

In reality, the categorization was quickly learned by the nonfamiliar speech/language pathologists and any problems in the comprehension of context was readily available on videotape. In subsequent studies, one may strongly consider an interjudge reliability component to the analysis, thereby making the results more robust.

7.7.3. THE NEED FOR TOPIC SHIFT ANALYSIS

Literature on brain damaged subjects referred to "appropriate" and "inappropriate" topic shifting, yet what is appropriate or inappropriate was rarely defined. The human communication research literature revealed a body of knowledge with regards to topic shifting which had never really been applied to brain-damaged populations. The present study illustrated some applications of this knowledge and the merit for further investigation of topic shifting behavior.

The sharing of topics is one of the goals all conversers have in common. Although Lorch, Lorch and Matthews (1985) were interested in text analysis, some of their arguments for studying topic structure could be generalized to conversational

discourse. First of all, understanding the topic structure is indicative of comprehension. A subject who is unable to demonstrate that he/she has some understanding of the topics discussed could not be said to have comprehended what the conversation was about. If this assumption is correct, then on-line processing of the topic structure could signal the process of comprehension of meaning relationships in both text and conversation. Lorch, Lorch and Matthews (1985) went on to suggest that, in text, if the immediate context is not sufficient for interpretation, knowledge of the topic will facilitate interpretation of the already read material. In conversation, if there is incongruence with the immediate meaning relationships, knowledge of the topic at hand could facilitate inferencing and proposition building. It is not at all evident that DAT subjects would be capable of doing this in light of their known working memory difficulties. Topic structure analysis, then, is a logical choice for investigation in these subjects. A representation of the topic structure can serve to help retrieve information necessary for on-line macroprocessing.

The choice of topic shifting as an initial area of investigation in these patients is further supported by the premise that "permissible" topic shifts allow for discourse continuity (Dascal & Katriel 1979). If one concludes that discourse continuity is a problem in DAT, then the type of shifts that occur is a valid avenue of study. The descriptive analysis done here has helped in further categorizing topic shifts, but no attempts were made to identify permissible shifts. Further exploration of the qualitative nature of the shifts may be more revealing. This was evident when a global interpretation was made of simple percentage of shifts. No noticeable differences were present at these levels.

Another qualitative observation may be to explore the concept of 'context spaces' as defined by Reichmann (1978). Examination of the transitions between these context spaces could prove to be useful in determining what is "permissible".

7.7.4. USE OF NATURAL CONVERSATION

Many investigators interested in conversational discourse have used a topic directed interview. Besides the obvious fact that this is not how one fundamentally converses, it is equally fundamental that, in conversation, we are trying to communicate something (inform, request, etc.); a notion the field of pragmatics has introduced (Holtgraves et al 1989, Levinson 1981). If one uses a topic directed interview, <u>what</u> is requested and <u>when</u> is preconceived and dictated. Hence, the investigator is in no way exploring whether a particular subject is capable of requesting or making substantial meaning relationships. In these situations, initiations are topic directed by the interviewer. Only natural conversation will allow spontaneous initiation information to be captured. The subjects in the present study made significant amounts of *topic initiations*. It is doubtful that this would have occurred in a topic directed interview.

Furthermore, natural conversation is not as unstructured as one may like to assume. The relatively low amounts of data in the *unknown* categories in the present study reflected that the other categories captured most of the available ways of shifting a topic. The larger percentage of *Unknowns* in the *Reason for Shift* section denoted that the types of reasons available to us for shifting a topic is far more extensive. Even in these categories, though, large amounts of shifts were classifiable. Natural conversation can, thus, be operationally described. This is true even for meaning relationships. As can be seen below, only certain responses are considered appropriate and random responses are not always interpretable. Consider the following example by Schank (1977, p 421).

(1) A: *I just bought a new hat.*
     B: *Fred eats hamburgers.*
(2) A: *I just bought a new hat.*
     B: *I just bought a new car.*
(3) A: *I just bought a new hat.*
     B: *There is supposed to be a recession.*
(4) A: *I just bought a new hat.*
     B: *My hat is in good shape.*
(5) A: *I just bought a new hat.*
     B: *What color?*

(6)   A: *I just bought a new hat.*
       B: *Why are you telling me this?*

Judgements are made about the appropriateness of each of the responses in the above examples. Number (1) may be considered "*absurd, (2) odd, (3) possible but nasty, (4) reasonable but slightly aberrant, (5) OK, and (6) OK, but on a level that discusses the statement rather than one that responds to it.* (p.421)". These examples are taken out of context and judgements are made without considering this contextual information, but it is obvious that conversers cannot say whatever comes to mind. Conversation is more structured, even in meaning. It is not at all evident that the reservations researchers have in not conducting research on natural conversation is fully warranted.

7.7.5. USE OF CASE STUDY DESIGN

Despite the knowledge that there are certain rules that are followed in all coherent conversations, it is foolish to assume that any one theory of conversation is capable of capturing all situational varieties of conversations. It is wiser and scientifically safer to start with single subjects and learn how to categorize a <u>single</u> situation and a <u>single</u> conversation taken in time. The argument is that although global speech act checklists of conversational behaviour were useful as an initial starting point, they are no longer warranted until more specific knowledge can be captured. Attempts to globally characterize conversations in group design studies was minimally helpful; especially in terms of meaning relationships.

Conversational behavior is so complex and dependent on the human identity of each participant that the very essence of conversational discourse cannot be captured (Bennett 1981) in the same sense one would describe some outside physical entity. In striving for common parameters, room must be left for individual variability and goals. The key is to find models that would help describe this individual variability.

For instance, on-line macroprocessing is said to be steered by individual goals (Lorch et al 1985). In natural conversation, one can only do on-line

macroprocessing in order to keep up with the flow of conversation. If they are influenced by individual goals, then case study designs are logical in examining how these goals are realized.

Finally and most importantly in justifying the use of a case study design, is the heterogeneous nature of the subjects and situations involved. Not only are the situations in which we converse so variable and hence need to be described individually, but there is shown heterogeneity in almost all aspects of this study. DAT subjects were shown in the review of the literature to be heterogenous in their impairments; there is increasing evidence that NE subjects are heterogenous in their cognitive abilities; and finally the text processing literature reveals that the ways in which we process text is guided by individual goals. All of these factors, in and of themselves, strongly suggest the use of single case study designs.

7.8. DISCOURSE THEORY AND TOPIC SHIFTING IN DEMENTIA
7.8.1. SPEECH ACT MODELS

As previously argued, speech act models are not well suited for defining meaning relationships. They show structural cohesion in terms of turn taking or adjacency pairs (Levinson 1981, Sanders 1983) but tell us nothing about the coherence of the text. Ripich et al's (1988) study was a good effort at describing a conversation in such terms. There was in this study, however, no indication that the content was coherent; that the meaning relationships were present and adhered to. Yet the principle difficulty found in DAT subjects is their problem with meaning relationships. Clearly, a speech act model is inappropriate for exploring these issues.

7.8.2. RELEVANCE

Two points need to be made with regards to relevance. The first concerns the notion of relevance as being dependent on the listener's interpretation and the second concerns the concept of 'marginal relevance'. Sanders' (1983) conception of relevance as being in the eye of the beholder can be extrapolated very nicely to

the present research in S.W.'s adaptation. As shown in previous sections, S.W. appeared to cohere that which was not coherent.

The notion of marginal relevance is described almost as a state of suspension for the processing of further propositions. Dascal & Katriel (1979) envisaged this mechanism in the processing of digressions, which, as described previously, are not unlike *inserts*. It is hypothesized that a hearer may hold an old topic in a state of marginal relevance while he is processing the new topic. The ability to do this may assume certain mnesic capabilities not available to DAT subjects, which may explain why these subjects had so few percentages of *inserts* and *anecdotes* in their conversations (except for subject A1).

7.8.3. PROCESSING MACROPROPOSITIONS IN CYCLES

A major component of Kintsch and Van Dijk's (1978) theory of text processing postulates that listeners use their short term memory buffers within Working Memory to store propositions so that they can be processed in cycles and matched with incoming information and information stored in longer term memories (i.e. Semantic and Episodic Memories). The propositions one chooses to store in this buffer are affected by many factors too lengthy to elaborate upon here. Kintsch and Van Dijk suggest that sometimes a speaker may facilitate a listener's decision in choosing such propositions by repeating crucial information from an old sentence and relating it to the new; thereby doing the listener's work. It is possible that this process occurs in what has been termed *topic shading*. The speaker could relate a new topic to an old one by 'shading' the semantic information. A normal converser may do this to facilitate coherence but an 'incompetent' converser with mnesic difficulties may be unable to do this. The coordination of this information in Working Memory would appear best suited to the central executive system rather than either of the two remaining components of working memory. The central executive system is suspected to be impaired in DAT subjects. If this hypothesis is correct, then the results of increased percentages of *topic shading* in the NE subjects could be explained.

Kintsch and Van Dijk (1978) also suggest that if the hearer arrives at some conflict in matching cycles of propositions, he will search all previously processed propositions for related information. In reading passages, this task would be easier for the DAT subjects since, if allowed to, they could return to the text and reprocess the propositions, provided they could keep the first ones in memory. In conversation, however, macroprocessing must be done on-line if the conversation is to remain coherent. This could be one of the reasons why the DAT subjects had less difficulty processing written text than orally presented discourse. In addition, should an incongruence occur in the cycles of propositions, relevant information could be searched in the Semantic and Episodic Memories. Based on the knowledge that DAT subjects have problems with these memories, it would be difficult for them to access this information for building a macroproposition.

Black (1985) believed that

"*the more unrelated facts one learns about a topic the longer it takes later to remember any given fact about the topic. However, if learners can integrate this information into a higher-level cognitive unit using their knowledge of the world, then they can later evaluate the plausibility of facts about the topic without going through the laborious and time-consuming fact-retrieval process.*" (p. 255)

It is possible to assume that if the DAT subjects were unable to develop an effective strategy for choosing which 'facts' or propositions were important (such as the leading-edge strategy proposed by Kintsch and Van Dijk), they might remember a series of unrelated facts and hence have difficulty remembering the gist of the topic. This would render keeping information in 'marginal relevance' very difficult. In addition, the integration of information into a 'higher-level' cognitive unit assumes an intact central executive system, which DAT subjects may not have. Black (1985) continued to relate that episodes are examples of these higher-level cognitive units. If so, then shifting a topic for *anecdotal* reasons should be slightly less frequent in the DAT populations. Another finding, which can be explained in Black's terms is S.W.'s adaptation skills. They could be viewed as her attempt to use her own knowledge to determine the plausibility of the information shared by her DAT partners.

Recalling the gist of a story is not only problematic in the DAT subjects. It was reported in the literature that the normal elderly could recognize information better than they could recall it (Cohen 1979; Hess and Arnould 1986; Kausler and Hakami 1983). In these narrative discourse studies, the elderly subjects had difficulty in recapitulating a story but were successful at recognizing the information in statements presented later.

In conversational discourse, there is heavy use of context. The context may assist in the recognition of topics and help the NE subject keep a coherent conversation. Emery (1985) suggested that her elderly subjects maintained the same context and code as their conversational partners. The impaired elderly did not. It could be postulated that the NE may be able to use this context for the recognition of topics whereas the DAT subjects could not.

In conclusion, when exploring the interaction of memory and discourse, clear, operational definitions must be made of those aspects of memory and those aspects of discourse which are being examined. Only in taking a less global approach at memory and discourse will knowledge be significantly advanced in this area. Subject A1 raised some interesting questions in this regard since she was functionally impaired memory-wise yet appeared to function quite well and more 'normally' in conversational discourse. This raised questions regarding the type of memory problem necessary to impair discourse and suggests some reconsideration of the notion of a discourse 'competence' problem which may, in fact, be relatively independent of memory functioning. Furthermore the different etiologies later discovered between A1 (a M.I.D. subject) and the DAT subjects suggested that discourse could be differentially affected in these populations, provided definitions of these are made. One must not forget, nor minimize, the notion that more cognitive abilities than simply a "memory" problem may be needed in order to "impair" conversational abilities.

7.9. PROBLEMS WITH REPORTED STUDIES OF CONVERSATIONAL DISCOURSE IN DEMENTIA

The present investigation was basically an initial exploratory attempt at defining one aspect of conversational discourse - namely, topic shifting. This work was not all inclusive nor was it necessarily representative of DAT and NE subjects' conversational skills. It served as one of many methodological examples of how one can describe certain features of conversational discourse in a few subjects within a given situation. This being said, it reflected some level of advancement in the exploration of meaning relationships in the conversations of some DAT subjects.

First of all, only two reported studies (Hutchinson and Jensen 1980; Ripich et al 1988b) looked at natural conversational discourse and one of these (Ripich et al 1988b) was a "pretend" coffee break from clinical testing. All others which claimed to look at conversation were in the form of topic directed interviews (Campbell-Taylor 1984; Cummings et al 1985; Illes 1986; Ripich et al 1988a). The irrelevance of topic directed interviews in looking at 'real' conversational discourse has been discussed.

Secondly, of the studies which examined natural conversations, only one (Hutchinson and Jensen 1980) mentioned topic shifting behavior. The other used a speech act approach to analysis. The relevance of using such a speech act model in looking at meaning relationships has been discussed. Furthermore, the Hutchinson and Jensen (1980) study used questionable criteria for determining "impairment" in their so-called "impaired" subjects and the results were almost anecdotal.

Most studies referred to structural items such as number of turns, number of words per turn, hesitations, pauses and the like. Those studies where higher discourse semantic relations (coherence) were considered, found inappropriate topic shifts (Campbell-Taylor 1984; Hutchinson and Jensen 1980), and abnormal content or 'unrelated semantics' (Campbell-Taylor 1984; Cummings et al 1985; Ripich et al

1983). These studies were anecdotal in their treatment of these issues and no relationship was drawn to known discourse processing models.

One team of researchers (Ripich et al 1988a; 1988b) found an adaptation on the part of the interviewer, though it was not discussed in these terms. Still here, the scope of the 'adaptation' was limited to increased number of words per turn and the like.

In conclusion, the research reported here stresses that future conversational discourse analysis studies of DAT subjects should take into consideration the following.

1. The use of discourse processing models as a framework.

2. Consideration of meaning relationships as a primary area of investigation since it is at this level that DAT subjects have the greatest difficulties. This implies using another approach besides adjacency pair analyses.

3. Consideration and description of the nature of the cognitive deficits (including memory) in these subjects. DAT subjects have known deficits of memory and other cognitive abilities. One or several of these may have an interaction with discourse processing.

4. Consideration must be given to contextual components like familiarity with the conversational partner, since there may be adaptational factors.

5. Description of the profiles of each subject must be made since there is known heterogeneity in DAT, in normal aging, in conversational style and even in the way we process propositions in discourse.

CHAPTER 8

CONCLUSION

The present investigation submitted an example of a feasible means of describing one facet of natural conversation. The methods used for this description were motivated in part by pragmatic and discourse processing concepts. These theoretical notions served as a basis for interpreting abstract concepts such as relevance and coherence, which were reported in the literature as being a major area of difficulty in subjects with dementia. Through the reading of the literature, it was concluded that errors of meaning relationships in these discourses may be best described through a detailed analysis of topic shifting behaviour.

For this reason, the study involved a more extensive analysis than had been proposed by previous researchers for examining how subjects shift topics in natural conversational discourse. The methods were designed to capture (1) a superficial summary of the conversation, (2) an element of technique for shifting topics, (3) an element of intention and (4) an element of knowledge usage. The first of these goals was achieved by allowing for a general tabulation of topic shifts and topic maintenances in the conversation as well as an exploration of the *place* where each topic shift had occurred (i.e. within or across turn of speech). When comparisons were made between normal elderly subjects and DAT subjects matched one-to-one for age, education, and occupation, no major observable differences were present on inspection of tabular and graphic data.

The second goal was achieved by enumerating different types of shifts which may occur, such as: *Topic Initiation, Topic Shading, Renewal, Insert, Unexpected, and Undetermined.* In these categories, it was found that *Topic Shadings* and *Inserts* occurred proportionately more often in the conversations with the normal elderly subjects than in the conversations with the DAT subjects. Closer examination of the processes involved in these types of shifts suggested that Topic Shadings may require a certain refinement of topic shifting skills unavailable to DAT subjects. *Inserts* were seen as some form of digression, which demanded

holding the previous information in a state of "marginal relevance". This skill may also have been particularly difficult for the DAT subjects. The DAT conversations, on the other hand, were shown to have proportionately more *Unexpected* shifts, although these were also present in the normal elderly conversations.

The third goal was aimed at exploring the intention of the speaker by delineating subcategories that could characterize the possible reasons for the shift: *End of Topic, Decreased Comprehension, Failure to Continue* the topic, shift to an *Outside Stimulus, Repetition of an Idea,* desire to share an *Anecdote* or *Unknown* reason. The matched conversations again showed some observable differences in this domain. Whereas the normal elderly conversations shifted proportionately more often as a result of *End of Topic* or to share an *Anecdote,* the DAT conversations showed proportionately more shifts due to *Decreased Comprehension* and *Failure to Continue* a topic. As with a digression and an *Insert,* shifting a topic to share an anecdote demanded that the conversational partner hold the previous topic in a state of "marginal relevance". This was particularly problematic for the DAT subjects. If one assumes that propositions must be held in a buffer to await further processing, one may hypothesize that the DAT subjects were choosing the wrong propositions, were unable to hold them in memory or unable to tie them into a coherent macrostructure. The increased proportions of shifts due to an abrupt failure to continue a topic, illustrated DAT subjects' reported difficulty in elaborating a topic.

The fourth descriptive goal used the *relation to context* categories in order to explore the use of knowledge: *Text, Environment, Specific Knowledge, General Knowledge, and Unknown.* No major differences were found here except that the normal elderly conversations related proportionately more often to *Specific Knowledge* and the DAT conversations to *Environment.* Although partly interesting, some of the categories were not detailed enough to explain the results. In addition, the increased reference to objects in the room, in the DAT conversations, was biased in terms of an increased use of "props" in these conversations.

Two additional, unexpected results entailed the performance of one subject, subject A1, and the performance of the conversational partner common to all conversations, the social worker (S.W.). A1's conversational discourse, on several occasions, resembled the normal elderly conversations more than it resembled the DAT conversations. Despite the clear cognitive deficits that this subject had on neuropsychological testing, her conversational discourse was only minimally affected on subjective interpretation. Subject A1 has since had her clinical diagnosis reconsidered and the working diagnosis is now Multi-infarct Dementia, not DAT.

S.W.'s performance was also very interesting. She used different topic shifting techniques with the normal elderly than she used with DAT subjects and she appeared to topic shift for different reasons, depending on the 'type' of subject. Hypotheses could be made regarding her ability to adapt to disordered, incoherent conversations and render irrelevant statements, relevant. Her performance with subject A1, who appeared more "normal", showed that she had somehow concluded that she could address this conversational partner in much the same way as the normal elderly. For instance, her increased use of anecdotes with the normal elderly subjects was present with subject A1, but not with the other DAT subjects. These results could have interesting implications for how caregivers may choose to adapt to patients' incoherent conversational discourse.

In summary, the study has underlined the importance of examining meaning relationships using spontaneous discourse. In addition, it has stressed the importance of focusing on one facet only of conversational discourse so that a more complete and accurate description could be had of this complex human behaviour. Needless to say, there are a vast array of other facets which can be explored, but the remainder of this chapter will describe some aspects which became increasingly important to further explore.

One future avenue could include a more thorough examination of topic maintenance. The present research only very superficially described the notion of topic maintenance and no interesting results were evident. Further exploration into

how conversers succeed in maintaining a topic may be more revealing. Crow (1983) has suggested using some of the techniques of narrative discourse analysis which explore the notions of cohesion. Topic units, for instance, could be seen as maintained by using a common referent, through ellipsis, conjunction, repetition, pronominalization, or by sequential implicature.

Another research suggestion could reinterpret the topic unit into Reichmann's (1978) notion of "context space". In her view, a context space is a way of restraining a series of semantic concepts into one grouping. They could be divided into an "issue" or an "event" context space. Meaning relationships could be explored in terms of the groupings themselves or, similar to this study, in terms of the transitions between the context spaces.

The further description of *Topic Shading* could also be investigated. Tracy and Moran (1983) suggested different types of linkages which may be used in relating a topic to a preceding one. These included a script linkage, a common idea linkage, a meta issue linkage, and a procedural linkage. Further study may concentrate on topic shadings alone and explore the meaning relationships between the old and new topics.

In DAT subjects, it was reasonable to conclude, through the review of the literature, that these subjects may be violating Grice's (1975) Maxim of Relation (Be Relevant). There are, however, other maxims which are violated by these patients. The Maxim of Manner, for instance, which states that conversational partners should avoid ambiguity, may be frequently violated. The Maxim of Quality (Be Truthful) may also be difficult for DAT subjects. Exploration into the accurateness of the information conveyed by these subjects may be interesting. This may be one of the clues by which a conversational partner decides when it is necessary to adapt to the conversational discourse.

The adaptability question is a very fascinating avenue of future inquiry. The familiarity issue is particularly alluring. Questions remain as to the effect of a

familiar conversational partner versus a nonfamiliar partner. For example, would a familiar partner adapt in much the same way that S.W. has done in the present investigation? If so, would the adaptation of the familiar partner deteriorate over time or in relation to the severity of the dementia? Clearly, familiarity has an effect on the types of knowledge that need to be made explicit. Pragmatic concepts would suggest that information that we know are in our hearer's accessible memory should not be repeated needlessly in conversation. Would the DAT subjects have this knowledge of their partner's knowledge, and therefore make some information less explicit? Would the familiar partner assume that the affected subject has this information accessible, and hence, not make the extra effort to make irrelevant statements, relevant? Lastly, is the capability to adapt to disordered discourse apparent in other brain damaged populations?

If knowledge is to be gained on (1) the complex processes involved in conversational discourse, (2) the effects of certain types of brain damage on these processes and (3) the sociolinguistic interactional information, researchers will need to refocus some of their attention to the analysis of natural discourse. Instead of avoiding the methodological issues related to this type of investigation, efforts should be made in trying to find better descriptive means which will characterize the differences. It is only through these efforts will we better understand the theoretical processes of conversational discourse and will clinicians be in a better position to describe what they sense as incoherence.

REFERENCES

Advanced Revelation. Revelation Technologies, Bellevue, Washington, 1987.

Albert, M.L., *Language in Normal and Dementing Elderly*. In L. Obler and M.L. Albert (eds.) Language and Communication in the Elderly, D.C. Heath & Company, New York, 1980.

Albert, M.S., *Cognitive Heterogeneity among Mildly Impaired Patients with Alzheimer's Type Dementia*, Abstract, Journal of Clinical and Experimental Neuropsychology, 1985 7(6), 610.

Albert, M. and Milberg, W., *Notes and Discussion: Semantic Processing in Patients with Alzheimer's Disease*, Brain and Language, 1989 37, 163-171.

Appell, J., Kertesz, A., Fisman, M., *A Study of Language Functioning in Alzheimer Patients*, Brain and Language, 1982 17, 73-91.

Assal, G., Favre, C., Regli, F., *Aphasie Degenerative*, Revue Neurologique, 1985 141, 245-247.

Austin, J.L., *How to do things with words*. Clarendon Press, Oxford, 1962.

Bach, K. and Harnish, R.M., *Linguistic Communication and Speech Acts*. MIT Press, Cambridge, 1979.

Baddeley, A.D., *Working Memory*. Clarendon Press, Oxford, 1986.

Baddeley, A.D., *The psychology of memory*. Basic Books Inc., New York, 1976.

Barker, M.G. and Lawson, J.S., *Nominal Aphasia in Dementia*, British Journal of Psychiatry, 1968 114, 1351-1356.

Bates, E., *Language and Context: The Acquisition of Pragmatics*. Academic Press, New York, 1976.

Bates, E., Masling, M. and Kintsch, W., *Recognition Memory for Aspects of Dialogue*, Journal of Experimental Psychology: Human Learning and Memory, 1978 4(3), 187-197.

Bayles, K.A., *Language and Dementia*. In A. Holland (ed.) Language Disorders in Adults, College Hill Press, San Diego, 1984.

Bayles, K.A., and Boone, D.R., *The Potential of Language Tasks for Identifying Senile Dementia*, Journal of Speech and Hearing Disorders, 1982 47, 204-210.

Bayles, K.A., and Tomoeda, C.K., *Confrontation and Generative Naming Abilities of Dementia Patients.* In R.H. Brookshire (ED.) Clinical Aphasiology Conference Proceedings, BRK Publishers, Minneapolis, 1983a.

Bayles, K.A., and Tomoeda, C.K., *Confrontation Naming Impairment in Dementia,* Brain and Language, 1983 <u>19</u>, 98-114.

Bayles, K.A., Kaszniak, A.W. and Tomoeda, C.K., *Communication and Cognition in Normal Aging and Dementia,* College-Hill Press, Boston, 1987.

Bayles, K.A., Boone, D.R., Tomoeda, C.K., Slauson, T.J., & Kaszniak, A.W., *Differentiating Alzheimer's patients from the normal elderly and stroke patients with aphasia,* Journal of Speech and Hearing Disorders, 1989 <u>54</u>, 74-87.

Bayles, K.A., Tomoeda, C.K., Kaszniak, A.W., Stern, L.Z., and Eagans, K.K., *Verbal Perseveration of Dementia Patients,* Brain and Language, 1985 <u>25</u>, 102-116.

Bellert, I., *On a Condition of the Coherence of Texts,* Semiotica, 1970 <u>2</u>, 335-363.

Bennett, A., *Interruptions and the Interpretation of Conversation,* Discourse Processes, 1981 <u>4</u>, 171-188.

Berg, L., Hughes, C.P., Coben, L.A., Danziger, W.L., Martin, R.L., and Knesevich, J., *Mild Senile Dementia of Alzheimer type: research diagnostic criteria, recruitement, and description of a study population,* Journal of Neurology, Neurosurgery, and Psychiatry, 1982 <u>45</u>, 962-968.

Berrendonner, A., *Eléments de Pragmatique Linguistique.* Les Editions de Minuit, Paris, 1981.

Black, J.B., *An Exposition on Understanding Expository Text.* In B.K. Britton & J.B. Black (Eds.) Understanding Expository Text: A Theoretical and Practical Handbook for Analyzing Explanatory Text. Lawrence Erlbaum Assoc, New Jersey, 1985.

Bloom, L. and Lahey , M., *Language Development and Language Disorders.* John Wiley & Sons, New York, 1978.

Boller, F., Tomohiko, M., Roessmann, U., and Gambetti, P., *Parkinson Disease, Dementia, and Alzheimer Disease: Clinicopathological Correlations,* Annals of Neurology, 1979 <u>7(4)</u>, 329 - 355.

Borrell, A. and Nespoulous, J.L., *La Linguistique à la croisée des chemins: de la neurolinguistique à la psycholinguistique. Une application: le circuit de la communication,* Annales de l'Université Toulouse-Le Mirail, 1973.

Bowles, N.L. and Poon, L.W., *Aging and Retrieval of Words in Semantic Memory*, Journal of Gerontology, 1985 **40**, 71-77.

Bransford, J.D. and Johnson, M., *Contextual Prerequisites for Understanding: Some Investigations of Comprhension and Recall*, Journal of Verbal Learning and Verbal Behavior, 1972 **11**, 717-726.

Breitner, J.C.S. & Folstein, M.F., *Familial Alzheimer Dementia: a prevalent disorder with specific clinical features*, Psychological Medecine, 1984 **14**, 63-80.

Brinton, B. and Fujiki, M., *Development of Topic Manipulation Skills in Discourse*, Journal of Speech and Hearing Research, 1984 **27**, 350-358.

Britton, B., Glynn, S.M., and Smith, J.W., *Cognitive Demands of Processing Expository Text: A Cognitive Workbench Model*. In B.K. Britton and J.B. Black (Eds.) Understanding Expository Text: A Theoretical and Practical Handbook for Analyzing Explanatory Text, Lawrence Erlbaum, Hillsdale, New Jersey, 1985.

Brown, J., *Some tests of the decay theory of immediate memory*, Quarterly Journal of Experimental Psychology, 1958 **10**, 12-21.

Burke, D.M., White, H., and Diaz, D.L., *Semantic Priming in young and older adults: Evidence for Age constancy in Automatic and Attentional Processes*, Journal of Experimental Psychology: Human Perception and Performance, 1987 **13(1)**, 79-88.

Campbell-Taylor, I., *Dimensions of Clinical Judgment in the Diagnosis of Alzheimer's Disease*. Doctoral Dissertation, State University of New York at Buffalo, 1984.

Chatelois, J. and Renaseau-Leclerc, C., *Considérations Neuropsychologiques sur le Vieillissement Normal et Pathologique*, Sante Mentale au Quebec, 1980 **5**, 41-58.

Chertkow, H., Bub, D., Caplan, D., *Two Functional Stages of Semantic Memory: Evidence from Dementia*. Abstract for Academy of Aphasia, 1987.

Chertkow, H., Bub, D., & Seidenberg, M., *Priming and Semantic Memory Loss in Alzheimer's Disease*, Brain and Language, 1989 **36**, 420-446.

Chiarello, C., Church, K.L., and Hoyer, W.J., *Automatic and Controlled Semantic Priming: Accuracy, Response Bias, and Aging*, Journal of Gerontology, 1985 **40(5)**, 593-600.

Chui, H.C., Teng, E.L., Henderson, V.W. & Moy, A.C., *Clinical subtypes of dementia of the Alzheimer type*, Neurology, 1985 **35**, 1544-1550.

Clark, H.H. and Haviland, S.E., *Comprehension and the Given-New Contract.* In R.O. Freedle (Ed.) Discourse Production and Comprehension, Ablex Publishing Corp., Norwood, New Jersey, 1977.

Clark, H.H. and Lucy, P., *Understanding what is Meant from What is Said: A Study in Conversaitonally Conveyed Requests,* Journal of Verbal Learning and Verbal Behavior, 1975 14, 56-72.

Clark, H.H. and Marshall, C.R., *Definite Reference and Mutual Knowledge.* In A.K. Joshi, B.L. Webber and J.A. Sag (Eds.) Elements of Discourse Understanding. Cambridge University Press, New York, 1981.

Clark, H.H. and Schaefer, E.F., *Collaborating on contributions to conversations,* Language and Cognitive Processes, 1987 2, 19-41.

Cohen, G., *Language Comprehension in Old Age,* Cognitive Psychology, 1979 11, 412-429.

Cole, M.G. and Dastoor, D.P., *A New Hierarchic Approach to the Measurement of Dementia,* Psychosomatics, 1987 28, 298-304.

Craik, F.I.M., and Lockhart, R.S., *Levels of Processing: A Framework for Memory Research,* Journal of Verbal Learning and Verbal Behavior, 1972 11, 671-684.

Critchley, M., *And All the Daughters of Musick Shall be Brought Low: Language Function in the Elderly,* Archives of Neurology., 1984 14, 1135-1139.

Crow, B., *Topic Shifts in Couples' Conversations.* In R.T. Craig & K. Tracy (Eds.) Conversational Coherence: Form, Structure and Strategy. Sage Publications, Beverley Hills, 1983.

Cummings, J.L. and Benson, D.F., *Dementia: A Clinical Approach,* Butterworth Publishers, Boston, 1983.

Cummings, J.L., Benson, D.F., Hili, M.A., and Read, S., *Aphasia in Dementia of the Alzheimer Type,* Neurology, 1985 35, 394-397.

Damasio, A.R., and Van Allen, M.W., *Changing Attitudes Toward Dementia,* Journal of the Iowa Medical Society, 1979, 351-355.

Dascal, M. and Katriel, T., *Digressions: A Study in Conversational Coherence,* PTL: A Journal for Descriptive Poetics and Theory of Literature, 1979 4, 203-232.

Davis, G.A. and Wilcox, M.J., *Adult Aphasia Rehabilitation: Applied Pragmatics.* College-Hill Press, San Diego, 1985.

deAjuriaguerra, J. and Tissot, R., *Some Aspects of Language in Various Forms of Senile Dementia (Comparisons with Language in Childhood).* In E.H. Lenneberg and E.Lenneberg (eds.) Foundations of Language Development, Academic Press, New York, 1975.

Desmarais, C. and Joanette, Y., *Word-naming deficits in Dementia of the Alzheimer Type.* Paper presented at the American Speech and Hearing Association Convention, November, Boston, Massachusetts, 1988.

Diesfeldt, H.F.A., *Semantic Impairment in Senile Dementia of the Alzheimer Type,* Aphasiology, 1989 **3(1)**, 41-54.

Dore, J., *Holophrases, speech acts and language universals,* Journal of Child Language, 1975 **2**, 21-40.

Ellis, D.G., Hamilton, M. and Aho, L., *Some Issues in Conversation Coherence,* Human Communication Research, 1983 **9(3)**, 267-282.

Emery, O.B., *Language and Aging,* Experimental Aging Research, 1985 **11**, 3-60.

Emery, O.B., and Emery, P.E. *Language in Senile Dementia of the Alzheimer Type,* The Psychiatric Journal of the University of Ottawa, 1983 **8**, 169-178.

Engelkamp, J. and Zimmer, H.D., *Dynamic Aspects of Language Processing: Focus and Presupposition.* Springer-Verlag, New York, 1983.

Ernst, B., Dalby, M.A., and Dalby, A., *Aphasic Disturbances in Presenile Dementia,* Acta Neurol. Scan., 1970 **41-47**, 99-100.

Feldstein, S. and Welkowitz, J., *A chronography of Conversation: In Defense of an Objective Approach.* In A.W. Siegman & S.S. Feldstein (Eds.) Nonverbal Behavior and Communication. Lawrence Erlbaum Associates, Hillsdale, New Jersey, 1978.

Fletcher, C.R., *Strategies for the Allocation of Short-Term Memory during Comprehension,* Journal of Memory and Language, 1986 **25**, 43-58.

Fletcher, C.R., *Short-Term Memory Processes in Text Comprehension,* Journal of Verbal Learning and Verbal Behavior, 1981 **20**, 564-574.

Flicker, C., Ferris, S.H., Crook, T. and Bartus, R.T., *Implications of Memory and Language Dysfunction in the Naming Deficit of Senile Dementia,* Brain and Language, 1987 **31**, 187-200.

Folstein, M.F., Folstein, S.E. and McHugh, P.R., *Mini-Mental State: A practical method for grading the cognitive state of patients for the clinician,* Journal of Psychiatric Research, 1975 **12**, 189-198

Foncin, J.F., Salmon, D., Supino-Viterbo, V., Feldman, R.G., Macchi, G., Mariotti, P., Scoppetta, C., Caruso, G., and Bruni, A.C., *Démence Présenile d'Alzheimer Transmise dans une famille étendue*, Revue Neurologique, 1985 **141**, 194-202.

Frederiksen, C.H., Bracewell, R.J., Breuleux, A., and Renaud, A., *The Cognitive Representation and Processing of Discourse: Function and Dysfunction.* In Y. Joanette and H.H. Brownell (Eds.) Discourse Ability and Brain Damage: Theoretical and Empirical Perspectives, Springer-Verlag, New York, 1990.

Fuld, P.A., Katzman, R., Davies, P. and Terry, R.D. *Intrusions as a sign of Alzheimer Dementia: Chemical and Pathological Verification,* Annals of Neurology, 1982 **11**, 155-159.

Gauthier, S. and Gauthier, L., *Alzheimer's Disease: New Research Trends,* Geriatrics, 1987 **June/July**, 18-25.

Gauthier, S., Robitaille, Y., Quirion, R., Leblanc, R., *Antemortem Laboratory Diagnosis of Alzheimer's Disease,* Prog. Neuro-Psychopharmacol. & Biol. Psychiat., 1986 **10**, 391-403.

Gauvreau, D., *Le paradigme de la maladie d'Alzheimer,* Interface, 1987 **Septembre/Octobre**, 16-21.

Gewirth, L.R., Shindler, A.G., and Hier, D.B., *Altered Patterns of Word Associations in Dementia and Aphasia,* Brain and Language, 1984 **21**, 307-317.

Goldberg, J.A., *A Move Toward Describing Conversational Coherence.* In R.T. Craig & K. Tracy (Eds.) Conversational Coherence, Sage Publications, Beverley Hills, 1983.

Goodenough, D.R. and Weiner, S.L., *The Role of Conversational Passing Moves in the Management of Topical Transitions,* Discourse Processes, 1978 **1**, 395-404.

Goodglass, H., *Naming Disorders in Aphasia and Aging.* In L. Obler & M.L. Albert (eds.) Language and Communication in the Elderly, D.C. Heath & Co, New York, 1980.

Goodglass, H., & Kaplan, E., *The Assessment of Aphasia and Related Disorders.* Lea & Febiger, Philadelphia, 1976.

Graf, P. & Schacter, D.L., *Implicit and Explicit Memory for New Association in Normal and Amnesic Subjects,* Journal of Experimental Psychology: Learning, Memory and Cognition, 1985 **11(3)**, 501-518.

Grice, H.P., *Logic and Conversation*. In P.Cole and J.L. Morgan (Eds.) Syntax and Semantics: Volume 3: Speech Acts, Academic Press, New York, 1975.

Gurland, B.J., *Public Health Aspects of Alzheimer's Disease and Related Dementia*. In W.E. Kelly (ed.), Alzheimer Disease and Related Disorders, Charles C. Thomas, Springfield, 1984.

Gustafson, L., Hagberg, B. & Ingvar, D.H., *Speech Disturbances in Presenile Dementia related to Local Cerebral Blood Flow Abnormalities in the Dominant Hemisphere*, Brain and Language, 1978 <u>5</u>, 103-118.

Gustafson, L., & Nilsson, L., *Differential Diagnosis of Presenile Dementia on Clinical Grounds*, Acta Psychiat. Scand., 1982 <u>65</u>, 194-209.

Hachinski, V., Iliff, L.D., Zilhka, E., duBoulay, G.H.D., McAllister, V.L., Marshall, J., Russell, R.W.R., Symon, L., *Cerebral blood flow in dementia*, Archives of Neurology, 1975 <u>32</u>, 632-637.

Hachinski, V., Potter, P., & Merskey, H., *Leuko-Araiosis*, Arch. Neurol., 1987 <u>44</u>, 21-23.

Hagberg, B., & Ingvar, D.H., *Cognitive Reduction in Presenile Dementia Related to Regional Abnormalities of the Cerebral Blood Flow*, British Journal of Psychiatry, 1976 <u>128</u>, 223- 225.

Hathaway, S.R. and McKinley, J.C., *Minnesota Multiphasic Personality Inventory Manual*. The Psychological Corporation, New York, 1943.

Haviland, S.E. and Clark, H.H., *What's New? Acquiring New Information as a Process in Comprehension*, Journal of Verbal Learning and Verbal Behavior, 1974 <u>13</u>, 512-521.

Haxby, J.V., *Heterogeneous Regional Distributions of Brain metabolic Abnormalities in Alzheimer's Disease*, Journal of clinical and Experimental Neuropsychology, 1985 <u>7(6)</u>, 610.

Hegde, M.N., *Clinical Research in Communicative Disorders: Principles and Strategies*. College-Hill Press, Boston, 1987.

Heilman, K.M. & Valenstein, E., *Clinical Neuropsychology*, Oxford University Press, New York, 1985.

Hess, T.M. and Arnould, D., *Adult age differences in memory for explicit and implicit sentence information*, Journal of Gerontology, 1986 <u>41</u>, 191-194.

Hier, D.B., Hagenlocker, K., and Shindler, A. *Language Disintegration in Dementia: Effects of Etiology and Severity,* Brain and Language, 1985 <u>25</u>, 117-133.

Holland, A.L., *Observing Functional Communication of Aphasic Adults,* Journal of Speech and Hearing Disorders, 1982 <u>47</u>, 50-56.

Holland, A.L., McBurney, D.H., Moossy, J., and Reinmuth, O.M., *The Dissolution of Language in Pick's Disease with Neurofibrillary Tangles: A Case Study,* Brain and Language, 1985 <u>24</u>, 36-58.

Holland, A.L., Miller, J., Reinmuth, O.M., Bartlett, C., Fromm, D., Pashek, G., Stein, D. and Swindell, C., *Rapid Recovery from Aphasia: A Detailed Language Analysis,* Brain and Language, 1985 <u>24</u>, 156-173.

Holtgraves, T., Srull, T.K., and Socall, D., *Conversation Memory: The Effects of Speaker Status on Memory for the Assertiveness of Conversation Remarks,* Journal of Personality and Social Psychology, 1989 <u>56(2)</u>, 149-160.

Holtzman, R.E., Familitant, M.E., Deptula, P. and Hoyer, W.J., *Aging and the use of Sentential Structure to facilitate word recognition,* Experimental Aging Research, 1986 <u>12</u>, 85-88.

Howard, D.V., *A multidimensional scaling analysis of aging and the semantic structure of animal names,* Experimental Aging Research, 1983 <u>9</u>, 27-30.

Howard, D.V., Shaw, R.J. and Hersey, J.G., *Aging and the time course of semantic activation,* Journal of Gerontology, 1986 <u>41</u>, 195-203.

Huff, F.J., Corkin, S., and Growdon, J.H., *Semantic Impairment and Anomia in Alzheimer's Disease,* Brain and Language, 1986 <u>28</u>, 235-249.

Huff, F.J., Mack, L., Mahlmann, J. and Greenberg, S., *A Comparison of Lexical-Semantic Impairments in Left Hemisphere Stroke and Alzheimer's Disease,* Brain and Language, 1988 <u>34</u>, 262-278.

Hughes, C.P., Bert, L., Danziger, W.L., ..., *A New Clinical Scale for the Staging of Dementia,* British Journal of Psychiatry, 1982 <u>140</u>, 566.

Hutchinson, J.M. and Beasley, S., *Speech and Language Functioning among the Aging.* In H. & E. Oyer (eds.) Aging and Communication, University Park Press, Baltimore, 1976.

Hutchinson, J.M. & Jensen, M., *A Pragmatic Evaluation of Discourse Communication in Normal and Senile Elderly in a Nursing Home.* In L.K. Obler & M.L. Albert (eds.) Language and Communication in the Elderly, D.C. Heath & Company 1980.

Hymes, D.A. *The Ethnography of Speaking.* In J.A. Fishman (Ed.) Readings in the Sociology of Language, Mouton, The Hague, 1968.

Illes, J., *Neurolinguistic Features of Spontaneous Language Production Dissociate Three Forms of Neurodegenerative Disease: Alzheimer's, Huntington's, and Parkinson's,* Brain and Language, 1989 **37**, 628-642.

Illes, J. *The structure of spontaneous language production in Alzheimer's, Huntington's and Parkinson's Disease.* Unpublished Ph.D. dissertation, Stanford University, 1986.

Irigaray, L., *Le Langage des Déments.* Mouton, The Hague, 1973.

Irigaray, L., *Approche Psycho-linguistique du Langage des Déments,* Neuropsychologia, 1967 **5**, 25-52.

Joanette, Y., Poissant, A., and Valdois, S., *Neuropsychological Dissociations in Dementia of the Alzheimer Type: A multiple single case study.* Paper presented at the 17th annual meeting of the International Neuropsychological Society, Vancouver, February 8-11, 1989.

Kahn, H.J., Joanette, Y., Ska, B. and Goulet, P., *Discourse Analysis in Neuropsychology: Comment on Chapman and Ulatowska,* Brain and Language, 1990 **38**, 454-461.

Kaszniak, A.W., Garron, D.C., Fox, J.H., Bergen, D., and Huckman, M., *Cerebral atrophy, EEG slowing, age, education, and cognitive functioning in suspected dementia,* Neurology, 1979 **29**, 1273-1279.

Katzman, R., Brown, T., Fuld, P., Peck, A., Schechter, R., and Schimmel, H., *Validation of a Short Orientation-Memory-Concentration Test of Cognitive Impairment,* American Journal of Psychiatry, 1983 **140**, 734-739.

Kausler, D.H. & Hakami, M.K., *Memory for Topics of Conversation: Adult age Differences and Intentionality,* Experimental Aging Research, 1983 **9**, 153-157.

Kazdin, A.E., *Statistical Analysis for Single-case Experimental Designs.* In D.H. Barlow & M. Hersen (Eds.) Single Case Experimental Designs: Strategies for Studying Behavior Change. Pergamon Press, N.Y., 1984.

Keenan, J.M., MacWhinney, B and Mayhew, D., *Pragmatics in Memory: A Study of Natural Conversation,* Journal of Verbal Learning and Verbal Behavior, 1977 **16**, 549-560.

Keenan, E.O. and Schieffelin, B.B., *Topic as a discourse notion: A study of topic in the conversations of children and adults.* In C.N. Li (Ed.) Subject and Topic, Academic Press, New York, 1976.

Keller, E., *Gambits: Conversational Strategy Signals.* In F. Coulmas (Ed.) Conversational Routing: Explorations in Standardized Communication Situations and Prepatterned Speech, Mouton Publishers, The Hague, 1981.

Kertesz, A., *Western Aphasia Battery.* The University of London Ontario, London, Canada, 1980.

Kintsch, W., *The Role of Knowledge in Disourse Comprehension: A Construction-Integration Model,* Psychological Review, 1988 9, 163-182.

Kintsch, W. & Van Dijk, T.A., *Toward a model of text comprehension,* Psychological Review, 1978 85, 363-394.

Kirshner, H.S., *Language Disorders in Dementia.* In H.S. Kirshner, F.R. Freeman (eds.) The Neurology of Aphasia, Swets Publishing Co, Amsterdam, 1982.

Kirshner, H.S., Webb, W.G., and Kelly, M.P., *The Naming Disorder of Dementia,* Neuropsychologia, 1984 22, 23-30.

Kirshner, H.S., Webb, W.G., Kelly, M.P., and Wells, C.E., *Language Disturbances: An Initial Symptom of Cortical Degenerations and Dementia,* Archives of Neurology, 1984 41, 491-496.

Kontiola, P., Laaksonen, R., Sulkava, R. and Erkinjuntti, T., *Pattern of Language Impairment is different in Alzheimer's Disease and Multi-infarct Dementia,* Brain and Language, 1990 38, 364-383.

Korpimes, L., *Some Aspects of Discourse and Cohesion.* In J.O. Ostman (Ed.) Cohesion and Semantics. Publications of the Research Institute of the Abo Axademi Foundation, 1978.

Kraut, R.E., and Higgins, E.T., *Communication and Social Cognition,* In R.S. Wyer and T.K. Srull (Eds.) Handbook of Social Cognition, Volume 3, Lawrence Erlbaum Associates, Hillsdale, N.J., 1984.

Kushnir, S.L., *Reflections on Alzheimer's Disease,* Canadian Journal of Psychiatry, 1982 27, 18-22.

Labov, W. and Fanshel, D., *Therapeutic Discourse: Psychotherapy as Conversation.* Academic Press, N.Y., 1977.

Lecours, A.R., Rascal, A., Nespoulous, J.L., Joanette, Y. and Puel, M., *Protocole Montréal-Toulouse, Examen de l'aphasie, version Beta modifiée*, Université de Montréal, 1986.

LeDoux, J.F., Blum, C., & Hirst, W., *Inferential Processing of Context: Studies of Cognitively Impaired Subjects*, Brain and Language, 1983 **19**, 216-224.

Levinson, S., *Pragmatics*. Cambridge University Press, Cambridge, 1984.

Levinson, S., *Some Pre-Observations on the Modelling of Dialogue*, Discourse Processes, 1981 **4**, 93-116.

Lorch, R.F., Lorch, E.P., Matthews, P.D., *On-Line Processing of the Topic Structure of a Text*, Journal of Memory and Language, 1985 **24**, 350-362.

Lubinski, R., *Environmental Considerations in Working with the Elderly*. Short course given in London, Ontario, March, 1984.

Lundquist, L. *La Cohérence Textuelle: Syntaxe, Sémantique, Pragmatique*. Nyt Nordisk Forlag Arnold Busck, Kobenhavn, 1980.

MacWhinney, B., Keenan, J.M. and Reinke, P., *The Role of Arousal in Memory for Conversation*, Memory and Cognition, 1982 **10**, 308-317.

Maletta, G.J., Pirozzolo, F.J., Thompson, G., and Mortimer, J.A., *Organic Mental Disorders in a Geriatric Outpatient Population*, American Journal Psychiatry, 1982 **139(4)**,

Mandler, J.M. and Johnson, N.J., *Remembrance of things parsed: Story structure and recall*, Cognitive Psychology, 1977 **9**, 111-151.

Marsden, C.D., *The Diagnosis of Dementia*. In A.D. Isaacs & F. Post (eds.) Studies in Geriatric Psychiatry. John Wiley & Sons, 1978.

Martin, A. & Fedio, P., *Word Production and Comprehension in Alzheimer's Disease: The Breakdown of Semantic Knowledge*, Brain and Language, 1983 **19**, 124-141.

Matheson, B.G. and Edwards, H.T., *The Re-Emergence of Egocentric Speech in the Elderly*, Paper presented at the American Speech-Language-Hearing Association, Toronto, Ontario, 1982.

Mattis, S., *Mental Status examination for organic mental syndrome in the elderly patient*. In R. Bellack and B. Karasu (Eds.), Geriatric psychiatry, Grune and Stratton, N.Y., 1976.

Mayeux, R., Stern, Y., Rosen, J., & Leventhal, J., *Depression, intellectual impairment, and Parkinson disease*, Neurology, 1981 **31**, 645-650.

Mayeux, R., Stern, Y., and Spanton, S., *Heterogeneity in dementia of the Alzheimer Type: Evidence of subgroups*, Neurology, 1985 **35**, 453-461.

Maynard, D.W., *Placement of topic changes in conversation*, Semiotica, 1980 **30-3/4**, 263-290.

McKhann, G., Drachman, D., Folstein, M., Katzman, R., Price, D., & Stadlan, E.M., *Clinical Diagnosis of Alzheimer's Disease*, Neurology, 1984 **34**, 939-944.

McLaughlin, M.L., *Conversation: How Talk is Organized*. Sage Publications, Beverley Hills, 1984.

McReynolds, L.V. and Kearns, K.P., *Single-Subject Experimental Designs in Communicative Disorders*. University Park Press, Baltimore, 1983.

Meyerson, M.D., *The effects of aging on communication*, Journal of Gerontology, 1976 **31**, 29-38.

Miller, E., *The Nature of the Cognitive Deficit in Senile Dementia*. In N.E. Miller & G.D. Cohen (eds.) Clinical Aspects of Alzheimer's Disease and Senile Dementia (Aging, Vol. 15), Raven Press, New York, 1981.

Miller, J.R., *A Knowledge-Based Model of Prose Comprehension: Applications to Expository Texts*. In B.K. Britton & J.B. Black (Eds.) Understanding Expository Text: A Theoretical and Practical Handbook for Analyzing Explanatory Text. Lawrence Erlbaum Assoc, Hillsdale, N.J., 1985.

Miniszek, N.A., *Development of Alzheimer Disease in Down Syndrome Individuals*, American Journal of Mental Deficiency, 1983 **87(4)**, 377-385.

Morin, L., *Elaboration d'une Grille d'Observation Pragmatique des Comportements de Communication chez l'Adulte et Détermination de la Fidelité d'Utilisation*. Mémoire présenté à la Faculté des Etudes Supérieures en vue de l'obtention du grade de M.O.A., Université de Montréal, 1985.

Morris, J.C., Cole, M., Banker, B.Q., & Wright, D., *Hereditary Dysphasic Dementia and the Pick-Alzheimer Spectrum*, Annals of Neurology, 1984 **16**, 455-466.

Morris, R.G., *Dementia and the functioning of the Articulatory Loop System*, Cognitive Neuropsychology, 1984 **3**, 77-97.

Morris, R.G. & Kopelman, M.D., *The memory deficits in Alzheimer-type Dementia: A Review,* The Quarterly Journal of Experimental Psychology, 1986 **38**, 575-602.

Mross, E.F., *Text Analysis: Macro- and Micro-Structural Aspects of Discourse Processing.* In Y. Joanette and H.H. Brownell (Eds.) Discourse ability and Brain Damage: Theoretical and Empirical Perspectives. Springer-Verlag, N.Y., 1990.

Mura-Swan, S., *Licensing Violations: Legitimate Violations of Grice's Conversational Principle.* In R.T. Craig and K. Tracy (Eds.) Conversational Coherence, Sage Publications, Beverley Hills, 1983.

Murdoch, B.E., Chenery, H.J., Wilks, V. and Boyle, R.S., *Language Disorders in Dementia of the Alzheimer Type,* Brain and Language, 1987 **31**, 122-137.

Murphy, G.L. *The Psycholinguistics of Discourse Comprehension.* In Y. Joanette and H.H. Brownell (Eds.) Discourse Ability and Brain Damage: Theoretical and Empirical Perspectives. Springer-Verlag, N.Y, 1990.

Nebes, R.D., *Preservation of Semantic Structure in Dementia.* In H.K. Ulatowska (ed.) The Aging Brain: Communication in the Elderly, College Hill Press, San Diego, 1985.

Nebes, R.D., and Boller, F., *The Use of Language Structure by Demented Patients in a visual Search Task,* Cortex, 1987 **23**, 87-98.

Nebes, R.D., Boller, F. and Holland, A., *Use of Semantic Context by Patients with Alzheimer's Disease,* Psychology and Aging, 1986 **1**, 261-269.

Nebes, R.D., Brady, C.B., and Jackson, S.T., *The Effect of Semantic and Syntactic Structure on Verbal Memory in Alzheimer's Disease,* Brain and Language, 1989 **36**, 301-313.

Nebes, R.D., Martin, D.C. and Horn, L.C., *Sparing of Semantic Memory in Alzheimer's Disease,* Journal of Abnormal Psychology, 1984 **9**, 321-330.

Nicholas, M., Obler, L.K., Albert, M. and Goodglass, H., *Lexical Retrieval in Healthy Aging,* Cortex, 1985 **21**, 595-606.

Ober, B.A., Dronkers, N.F., Koss, E., Delis, D.C., Friedland, R.P., *Retrieval from Semantic Memory in Alzheimer-type Dementia,* Journal of Clinical and Experimental Neuropsychology, 1986 **8(1)**, 75-92.

Obler, L.K., *Language and Communicaiton: Healthy Aging and in Dementia.* Short course presentation in London, Ontario, March, 1984.

Obler, L.K., *Language and Brain Dysfunction in Dementia*. In S.J. Segalowitz (ed.) Language Functions and Brain Organization, Academic Press, New York, 1983.

Obler, L.K., *Narrative Disourse Style in the Elderly*. In L.K. Obler & M.L. Albert (eds.) Language and Communication in the Elderly, D.C. Heath & Co, 1980.

Obler, L.K., *Psycholinguistic Aspects of Language in Dementia*. Paper presented in symposium on Language and Communication in Healthy and Dementing Elderly, Academy of Aphasia, San Diego, 1979.

Obler, L.K., *Review of 'Le Langage des Déments' by Luce Irigaray*, Brain and Language, 1973 **12**, 357-386.

Obler, L.K., & Albert, M.L., *Historical Note: Jules Séglas on Language in Dementia*, Brain and Language, 1985 **24**, 314-325.

Obler, L.K., & Albert, M.L., *Language and Aging: A Neurobehavioral Analysis*. In D.S. Beasley & G.A. Davis (eds.) Aging: Communication Processes and Disorders, Grune & Stratton, New York, 1981a.

Obler, L.K., & Albert, M.L., *Language in the Elderly Aphasic and in the Dementing Patient*. In M. Sarno (ed.) Acquired Aphasia, Academic Press, New York, 1981b.

Obler, L.K., Albert, M.L., Helm-Estabrooks, N. and Nicholas, M., *Non-Informative Speech in Alzheimer's Dementia and in Wernicke's Aphasia*. Paper presented at the Academy of Aphasia, New Paltz, New York, 1982.

Obler, L.K., Fein, D., Nicholas, M., & Albert, M.L., *Syntactic Comprehension in Aging*. Poster presented at the annual meeting of the Academy of aphasia, October 21, Pittsburgh, Penn., 1985.

Patry, R. & Nespoulous, J.-L., *Discourse Analysis in Linguistics: Historical and Theoretical Background*. In Y. Joanette & H. H. Brownell (Eds) Discourse Ability and Brain Damage: Theoretical and Empirical Perspectives, Springer-Verlag, N.Y., 1990.

Pedley, T.A. & Miller, J.A., *Clinical Neurophysiology of Aging and Dementia*. In R. Mayeux & W. Rosen (eds.) Advances in Neurology Vol 38: The Dementias, Raven Press, N.Y., 1983.

Peterson, L.R. and Peterson, M.J., *Short term retention of individual verbal items*, Journal of Experimental Psychology, 1959 **58**, 193-198.

Pickett, J.M., Bergman, M., and Levitt, H., *Aging and Speech Understanding*. In J.M. Ordy and K. Brizzee (eds.) Sensory Systems and Communication in the Elderly, Raven Press, New York, 1979.

Planalp, S., *Relational Schemata: A test of Alternate Forms of Relational Knowledge as Guides to Communication,* Human Communication Research, 1985 **12(1),** 3-29.

Planalp, S. and Tracy, K., *Not to change the topic but...: A cognitive approach to the management of conversation.* In D. Nimmo (Ed.) Communication Yearbook 4, Transaction Books, New Brunswick (U.S.A.), 1980.

Pouliot, C., *Modifications avec l'âge du fonctionnement lexico-sémantique chez l'adulte.* Mémoire de maîtrise, université de Montréal, 1988.

Price, D.L., *Neuropathology of Alzheimer's Disease.* In W.E. Kelly (ed.) Alzheimer Disease and Related Disorders, Charles C. Thomas, Springfield, Illinois, 1984.

Prutting, C.A., *Process: The Action of Moving Forward Progressively from One Point to Another on the Way to Completion,* Journal of Speech and Hearing Disorders, 1979 **44,** 3-30.

Prutting, C.A. and Kirchner, D.M., *Applied Pragmatics.* In T.M. Gallagher and C.A. Prutting (Eds.) Pragmatic Assessment and Intervention Issues in Language. College Hill Press, San Diego, 1983.

Rampello, C., Wright, L. and Wollner, S.G., *Speech Act Production of Adult Aphasics.* Paper presented at the Annual Meeting of the American Speech/Language/Hearing Association, Toronto, November, 1982.

Randels, P.M., *Biological Correlates of Primary Degenerative Dementia,* In W.E. Kelly (ed.) Alzheimer Disease and Related Disorders, Charles C.Thomas, Springfield, Illinois, 1984.

Randt, C.T. and Brown, E.R., *Randt Memory Test: Administration Manual.* Life Science Associates, Bayport, N.Y.

Rees, N.S., *Pragmatics of Language.* In R.L. Schiefelbusch (Ed.) Bases of Language Intervention, University Park Press, Baltimore, 1978.

Reichman, R., *Conversational Coherency,* Cognitive Science, 1978 **2,** 283-327.

Reisberg, B., Ferris, S.H., DeLeon M.J. and Crook, T., *The Global Deterioration Scale for Assessment of Primary Degenerative Dementia,* American Journal of Psychiatry, 1982 **139,** 9.

Ripich, D.N. and Terrell, B.Y., *Patterns of Discourse Cohesion and Coherence in Alzheimer's Disease,* Journal of Speech and Hearing Disorders, 1988 **53,** 8-15.

Ripich, D.N., Terrell, B.Y., & Spinelli, F., *Discourse Cohesion in Senile Dementia of the Alzheimer Type*. In R.H. Brookshire (ed.) Clinical Aphasiology Conference Proceedings, BRK Publishers, Minneapolis, 1983.

Ripich, D.N., Vertes, D., Whitehouse, P., and Fulton, S., *Conversational Discourse Patterns in Senile Dementia of the Alzheimer's Type Patients*. Paper presented at the American Speech-Language-Hearing Association Annual Convention, Boston, Mass, 1988.

Robertson-Tchabo, E., *Psychological Changes with Aging*. In L. Jacobs-Condit (ed.) Gerontology and Communication Disorders, American Speech-Language-Hearing Association, Rockville, Maryland, 1984.

Rochford, G., *A Study of Naming Errors in Dysphasic and Demented Patients*, Neuropsychologia, 1971 9, 437-445.

Ropper, A.H., *A rational approach to dementia*, Review Article, Canadian Medical Association Journal, 1979 121(3), 1175-1190.

Rosen, W., *Verbal fluency in aging and dementia*, Journal of Clinical Neuropsychology, 1980 2(2), 135-146.0

Sacks, H., Schegloff, E.A., Jefferson, G., *A Simplest Systematics for the Organization of Turn-taking in Conversation*, Language, 1974 50(4), 696-735.

Sanders, R.E., *Tools for Cohering Discourse and Their Strategic Utilization: Markers of Structural Connections and Meaning Relations*. In R.T. Craig and K. Tracy (Eds.) Conversational Coherence: Form, Structure, and Strategy, Sage Publications, Beverley Hills, 1983.

Schacter, D.L., *Implicit Memory: History and Current Status*, Journal of Experimental Psychology: Learning, Memory and Cognition, 1987 13(3), 501-518.

Schank, R.C., *Rules and Topics in Conversation*, Cognitive Science, 1977 1, 421-444.

Schwartz, M.F., Marin, O.S.M., & Saffran, E.M., *Dissociations of Language Function in Dementia: A Case Study*, Brain and Language, 1979 7, 277-306.

Searle, J.R., *Indirect Speech Acts*. In P.Cole and J.L. Morgan (Eds.) Syntax and Semantics: Volume 3: Speech Acts, Academic Press, N.Y., 1975.

Searle, J.R., *Speech Acts: An Essay in the Philosophy of Language*. Cambridge University Press, 1969.

Searle, J.R., *"What is a speech act?"* In M. Black (Ed.) Philosophy in America. Allen & Unwin Pub., Cornell, 1965.

Seltzer, B., & Sherwin, I., *A Comparison of Clinical Features in Early- and Late-Onset Primary Degenerative Dementia: One Entity or Two?*, Archives of Neurology, 1983 **40**, 143-146.

Shekim, L.D. and LaPointe, L.L., *Production of discourse in Individuals with Alzheimer's Disease.* Paper presented to the International Neuropsychological Society, Houston, Texas, February, 1984.

Shindler, A.G., Caplan, L.R. and Hier, D.B. *Intrusions and Perseverations,* Brain and Language, 1984 **23**, 148-158.

Shore, D., Overman, C.A., & Wyatt, R.J., *Improving Accuracy in the Diagnosis of Alzheimer's Disease,* Journal of Clinical Psychiatry, 1983 **44**, 207-212.

Shuttleworth, E.C. and Huber, S.J., *The Naming Disorder of Dementia of the Alzheimer Type,* Brain and Language, 1988 **34**, 222-234.

Ska, B. and Goulet, P., *Trouble de dénominations lors du viellissement normal,* Langages, 1989 **24**, 112-127.

Ska, B., Poissant, A., Béland, R., Lecours, A.R. and Joanette, Y., *Differential Language Patterns in Alzheimer's Disease,* Journal of Clinical and Experimental Neuropsychology, 1990 **12(1)**, 18.

Skelton-Robinson, M. & Jones, S., *Nominal Dysphasia and the Severity of Senile Dementia,* British Journal of Psychiatry, 1984 **145**, 168-171.

Smith, S.R., Murdoch, B.E., and Chenery, H.J., *Semantic Abilities in Dementia of the Alzheimer Type,* Brain and Language, 1989 **36**, 314-324.

Spillich, G.J., *Life-span Components of Text Processing: Structural and Procedural Differences,* Journal of Verbal Learning and Verbal Behavior, 1983 **22**, 231-244.

Spreen, O. & Benton, A.L., *Neurosensory Center Comprehensive Examination for Aphasia.* University of Victoria, Victoria, 1977.

Stein, D.W., *A Comparison of the Language of Demented, Depressed, and Psychiatric Patients.* Paper presented at the American Speech and Hearing Association Convention, Toronto, 1982.

Stevens, S., *The Language of Dementia in the Elderly : A Pilot Study,* British Journal of Disorders of Communication, 1985 **20**, 181-190.

Stubbs, M., *Discourse Analysis: The Sociolinguistic Analysis of Natural Language.* University of Chicago Press, Chicago, 1983.

Thomas, J.C., Fozard, J.L., Waugh, N.C., *Age related differences in naming latency*, American Journal of Psychology, 1977 **90**, 499-509.

Tracy, K., *On getting the point: distinguishing "Issues" from "Events" an aspect of conversational coherence.* In M.Burgoon (Ed.) Communication Yearbook 5, Transaction Books, New Brunswick, (U.S.A.), 1982.

Tracy, K. and Moran, J.P. III., *Conversational Relevance in Multiple-Goal Settings.* In R.T. Craig and K. Tracy (Eds.) Conversational Coherence, Sage Publications, Beverley Hills, 1983.

Troster, A.I., Salmon, D.P., McCullough, D. and Butters, N., *A Comparison of the Category Fluency Deficits Associated with Alzheimer's and Huntington's Disease,* Brain and Language, 1989 **37**, 500-513.

Tulving, E., *Précis of "Elements of episodic memory",* The Behavioral and Brain Sciences, 1984 **7**, 223-268.

Tulving, E., *Episodic and semantic memory.* In E. Tulving and W. Donaldson (eds.) Organization of memory, Academic Press, N.Y., 1972.

Ulatowska, J.K., Cannito, M.P., Hayashi, M.M., & Fleming, S.G., *Language Abilities in the Elderly.* In H.K. Ulatowska (ed.) The Aging Brain: Communication in the Elderly, College Hill Press, San Diego, 1985.

Ulatowska, H.K., Hayashi, M.M., Cannito, M.P. and Fleming, S.G., *Disruption of Reference in Aging,* Brain and Language, 1986 **28**, 24-41.

Valdois, S., Joanette, Y., Poissant, A., Ska, B. and Dehaut, F., *Heterogeneity in the Cognitive Profile of Normal Elderly,* Journal of Clincal and Experimental Neuropsychology, 1990 **12(4)**, 1-10.

Van der Linden, M., *Cognitive Approach to and Neuropsychology of Memory.* Workshop given at Centre de Recherche Théophile Alajouanine, Montreal, May, 1988.

Van Dijk, T.A., *Studies in the Pragmatics of Discourse.* Mouton Publishers, The Hague, 1981.

Van Dijk, T.A., *Macrostructures: An interdisciplinary study of global structures in discourse, interaction, and cognition.* Lawrence Erlbaum Assoc., Hillsdale, N.J., 1980.

Van Dijk, T.A., *Context and Cognition: Knowledge Frames and Speech Act Comprehension,* Journal of Pragmatics, 1977 **1**, 211-232.

Van Dijk, T.A. and Kintsch, W., *Strategies of Discourse Comprehension*. Academic Press, N.Y., 1983.

Veroff, A.E., Pearlson, G.D., & Ahn, H.S., *CT scan and Neuropsychological Correlates of Alzheimer's Disease and Huntington's Disease*, Brain and Cognition, 1982 1, 177-184.

Vuchinich, S., *Elements of Cohesion between Turns in Ordinary Conversation*, Semiotica, 1977 20:3/4, 229-257.

Wardhaugh, R., *How Conversation Works*. Basil Blackwell Publishers, N.Y., 1985.

Wechsler, D., *Wechsler Memory Scale - Revised*. The Psychological Corporation, New York, 1987.

Wechsler, D., *Wechsler Adult Intelligence Scale - Revised Manual*. The Psychological Corporation, New York, 1981.

Wechsler, D., *A standardized memory scale for clinical use*, Journal of Psychology, 1945 19, 87-95.

Werth, P., *The concept of 'relevance' in conversational analysis*. In P. Werth (Ed.) Conversation and discourse: Structure and interpretation, St. Martin's, New York, 1981.

Whitaker, H., *A Case of the Isolation of the Language Function*. In H. Whitaker & H.A. Whitaker (eds.) Studies in Neurolinguistics Vol. 2, Academic Press, New York, 1976.

Widdowson, H.G., *Explorations in Applied Linguistics*. Oxford University Press, Oxford, 1979.

Wiemann, J.M., *Effects of Laboratory Videotaping procedures on Selected Conversation Behaviors*, Human Communication Research, 1981 7(4), 302-311.

Wilson, D. and Sperber, D., *On Grice's theory of conversation and discourse: structure and interpretation*. St. Martin's, New York, 1981.

Wilson, R.S., Fox, J.H., Huckman, M.S., Bacon, L.D., & Lobick, J.J., *Computed Tomography in Dementia*, Neurology, 1982 32, 1054-1057.

Wurtman, R.J., *Alzheimer's Disease*, Scientific American, 1985 252, 62-74.