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Clause Complex Relations in Aphasic Discourse: A Longitudinal Case Study

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ABSTRACT

This study documents the ways in which an aphasic speaker FP joins clauses together to form texts, using Halliday's systemic–functional grammar as the framework for analysis. In particular, it analyses the patterns of clause complex relations demonstrated—both from structural and logico-semantic perspectives. These constitute the logical metafunction, one of the three main aspects of language function postulated by Halliday as being integral to the language system. FP's patterns of clause complex relations over a six-month period following his stroke are documented and compared with data obtained from a matched normal speaker ED as well as other data currently available on normal performance. Results show similarities between FP and normal speakers in terms of range of options available to both. However, differences are reported in the frequency with which these options are chosen. The results are discussed in terms of the retained abilities of the aphasic speaker and the ways in which these abilities are used to create meanings in discourse.

INTRODUCTION

Analysis of aphasic discourse to date has largely involved examination of three aspects of discourse. These include (i) so-called pragmatic aspects of discourse e.g. turn-taking, initiation of topics, conversational repair; (ii) elements of text superstructure (e.g. in a narrative—story setting, participants, complicating action, resolution etc). and (iii) intra-sentential/intra-clausal phenomena e.g. length of clause in terms of words and morphemes, amount of clausal embedding, syntactic error (e.g. omissions of clause elements such as subject, verb, functors) and analysis of lexical errors. Except for some acknowledgement of inter-clausal dependency via the quantification of dependent clauses (Ulatowska *et al.* 1981; Ulatowska *et al.* 1983; Glosser *et al.* 1988; Glosser and Deser 1990; Brenneise-Sarshad *et al.* 1991), one of the only

aspects examined in detail across clause boundaries has been that of cohesion (Lemme *et al.* 1984; Piehler and Holland 1984; Bottenberg *et al.* 1985; Armstrong 1987).

Lack of continuity or disjointedness is a major feature of aphasic discourse. The above mentioned analyses are all attempts at getting to the heart of this disjointedness. Many of the analyses, however, either address the semantic discourse level of superstructure or pragmatic aspects of discourse without reference to how these phenomena are realized lexicogrammatically or how they operate at the clause level. Such analyses neglect to look at the function of the intra-clausal phenomena in realizing discourse functions and largely ignore inter-clausal relations.

As already mentioned, cohesion has been investigated to some extent, with aphasic speakers demonstrating less use of cohesive devices overall than normal speakers. An area which has been much less explored, however, is that of inter-clausal relations or what Halliday (1985a) calls clause complex relations. As another important aspect of the construction of a text, this would seem a significant area to explore, particularly as it purports to examine the logico-semantic as well as the structural aspects of text construction. While occasional references have been made in the literature, as mentioned earlier, to clausal dependency, no attempt has been made to characterise the logico-semantic relations between clauses—an important aspect when looking at how a speaker logically sequences his/her discourse and one which appears quite relevant to the description of disjointed aphasic discourse.

It is the purpose of this paper to present data obtained from analysis of one aphasic speaker's discourse based on Halliday's systemic–functional framework (Halliday 1973, 1985a, 1985b) and in particular those notions related to clause complexing i.e. inter-clausal relations. Systemic–functional grammar offers a rich framework within which to explore such phenomena, as it is a grammar based on function rather than form. Rather than simply focusing on individual clause structures contained within a text, it allows examination of the semantic function of each clause in relation to what precedes it and what follows it within the text. It is a grammar which recognises discourse as the basic unit of communication rather than the word or the sentence. In the systemic–functional framework, discourse is seen as a semantic unit, not a syntactic one. Hence, analysis is based on what meanings the speaker is conveying through the forms s/he chooses rather than simply focusing on the forms themselves.

This study examines clause complex data obtained from an aphasic speaker FP over a 6-month period following his stroke and compares it to that obtained from normal speakers. These normal comparisons will be drawn from data obtained from one normal speaker, ED, used in the current study, matched with FP in terms of age and education level and data obtained by Nesbitt and Plum (1988) in a study of normal speakers. Nesbitt and Plums' study explored the notion of probability in a systemic–functional grammar, examining the frequency of occurrence of different types of clause complex relations. While their data represents preliminary findings regarding

probability of these phenomena within the non-brain-damaged population, it provides some means by which tentative comparisons can be made—a useful exercise when exploring pathological phenomena.

SUBJECT FP

FP was a 70-year old male who became aphasic following a stroke on 13.9.91. CT scanning revealed a large area of low density involving the left parietal lobe, extending medially to involve the left external capsule and basal ganglia. This was considered to be consistent with a large infarct. Also reported was some *ex-vacuo* dilatation of the anterior horn of the left lateral ventricle as well as generalised prominence of the sulci consistent with cerebral atrophy, in keeping with FP's age.

Clinically, FP presented on admission to hospital with a marked aphasia (saying only an occasional word and following only simple commands inconsistently), a right hemiparesis, a right facial weakness and a dyspraxia involving difficulty in sequencing activities. When first seen by a speech pathologist 3 days following the stroke, FP's speech had significantly improved from admission status. His speech was fluent but 'vacuous'. Significant naming problems were evident, with circumlocutory behaviour noted. A minimal dysarthria was also noted. FP could read aloud fluently but could comprehend at the single sentence level only. His auditory comprehension was significantly impaired and he was unable to write at all.

FP received daily in-patient rehabilitation for 1 month, after which he was discharged home. At that time, most of the problems except for the aphasia had resolved. He continued therapy as an out-patient on a weekly basis for the following 2 months and was discharged mainly at his own request. Significant improvements were noted over this period.

When first seen at 1 month post onset for the purpose of this study, FP's oral discourse was moderately impaired. He spoke relatively fluently but was experiencing significant problems in conveying meanings succinctly. He was rated at level '3' on the Aphasia Severity Rating Scale of the Boston Diagnostic Aphasia Examination (BDAE) (Goodglass and Kaplan 1983), indicating that he could 'discuss almost all everyday problems with little or no assistance. Reduction of speech and/or comprehension, however, makes conversation about certain material difficult or impossible.' FP was aware of his difficulties and was experiencing a mild degree of frustration when attempting to express himself.

Prior to the stroke, FP had been living an active life. He lived with his wife and saw extended family regularly. He was a retired business manager, with qualifications in business administration and accounting. Formal education totalled 14 years. Medically, FP had had long-standing hypertension but prior to the stroke, except for this and a wasted leg as the result of childhood polio, was otherwise

physically and mentally intact. He had no history of neurological damage and his hearing was normal.

SUBJECT ED

ED was a 64 year old male with normal communication skills. He had never had any neurological damage or hearing loss. He lived with his wife and also saw other family regularly. His life was an active one and prior to retiring, ED held a senior management position with a large national company. Formal education totalled approximately 14 years.

METHODOLOGY

Thirty minute samples of the aphasic subject's oral discourse were audiotaped on three occasions following his stroke—at 1 month post onset (1 MPO), 3 MPO and 6 MPO. Data was gathered longitudinally in what constitutes the main recovery period after stroke in order to obtain maximum information regarding what happens to the aphasic speaker's linguistic system after neurological insult.

Six texts of the narrative genre were elicited during the taping. Four narratives were elicited by a question from the researcher on particular topics ('Tell me about what happened when you had your stroke', 'Tell me about what you were doing during the war', 'Tell me abut your most frightening experience' and 'Tell me about your happiest experience') and two were elicited in response to stories depicted in a sequence of six pictures each. On each occasion, the subject was asked to speak on these same topics in order to facilitate comparison of performance across occasions. The normal speaker was required to speak on the same topics. Instead of the stroke recount, however, he related an account of an illness he had had in the past requiring hospitalisation.

Psycholinguistic Testing

As well as the linguistic analysis, to be described below, FP was given two psycholinguistically-based tests used regularly in clinical practice as well as aphasiology research—the Boston Diagnostic Aphasia Examination and the Boston Naming Test (BNT) (Kaplan *et al.* 1983). These tests were administered in order to provide indications of change in the subject's skills which could be compared with the results of the linguistic analysis. FP's results on these tests are presented in Table 1.

These test results indicate that FP began at 1 MPO in the mild to moderate range of severity and had improved to the mild range by 6 MPO. Most verbal skills appeared to improve the most dramatically between 1 and 3 MPO, while auditory comprehension improved most between the 3 MPO and 6 MPO stages.

TABLE 1
FP's Performance on Psycholinguistically Based Aphasia Tests over the 6-month Period Studied

	1 MPO	3 MPO	6 MPO
BDAE:			
Severity rating	3	4	4
Mean percentiles			
Aud. Comp.	81	80	90
Naming	77	88	91
Oral Reading	87	90	95
Repetition	60	73	77
Reading Comp.	82	82	84
Writing	85	89	94
Boston naming test	17/60	31/60	31/60

Linguistic Analysis: Clause Complexes

Relations between clauses in FP's discourse were analysed using Halliday's description of inter-clausal relations or relations existing within clause complexes (1985a). In a systemic–functional grammar, a rank scale of grammatical constituency exists, similar to those of traditional grammars, involving the morpheme, the word, the group and the clause. However, Halliday adds the rank of the clause complex to explain textual phenomena beyond the single clause level.

The notion of clause complex, as used by Halliday, engenders the idea that a clause's meaning depends on the surrounding co-text and that a rank above the clause is required to explain certain phenomena related to meaning within a text. The term 'sentence' is often referred to as a grammatical unit covering such phenomena. Indeed, in the case of written English, the sentence most closely resembles the clause complex. However, the sentence is merely a constituent of writing rather than a constituent of grammar. It is not able to be identified in oral discourse as its definition is created through visible punctuation only available in writing. However, the semantic and structural relations occurring within a sentence must surely exist within the grammar as a whole—hence the notion of clause complex, as a rank in the grammar, encompasses such relations and accounts for oral as well as written discourse (for further discussion, see Halliday 1985c).

For the purposes of this study, the clause complex relations were examined in terms of two dimensions—that of interdependency—the 'tactic' system involving parataxis and hypotaxis—and that of the logico-semantic system, involving the relations of expansion and projection. In Halliday's terms, *parataxis* '...is the relationship

between two like elements of equal status' and *hypotaxis* '. . . is the relation between a dependent element and its dominant, the element on which it is dependent' (p. 195).

Examples of parataxis are the following:

(1a) We were travelling around a big right-hand kerb
And the road was not wonderful

(b) The kids in the back were crying like mad
And Eileen was a death white

Examples of hypotaxis are the following:

(2a) As we were driving into Wangaratta
We were travelling around a big right hand kerb

(b) We went into the most terrific skid
Doing a figure eight around the road

Each pair of clauses related either paratactically or hypotactically can then be characterised in terms of the logico-semantic relations which hold between them. One of the clauses will be seen as the primary clause while the other is regarded as the secondary clause. As noted above, the main relations are those of *expansion* and *projection*. *Expansion* is further sub-categorised into elaboration, extension and enhancement. Each of these involves the secondary clause expanding on the meaning of the primary clause.

Elaboration does not involve the secondary clause providing any new information, but rather re-stating, clarifying, exemplifying or refining what is already stated in the primary clause. Consider the following examples from the subjects' texts:

(3a) The road was not wonderful
It had a lot of broken bitumen on the left hand side

(b) We went into a most terrific skid
Doing a figure eight around the road

In Example 3(a), the second clause elaborates on 'why' the road was not considered to be wonderful, as suggested in the initial clause. This elaboration is paratactic i.e. while one elaborates on the other, each clause is structurally independent. Example 3(b) also illustrates elaboration, but this exemplifies elaboration by hypotaxis rather than parataxis i.e. the second clause could not stand alone, in this case because of the non-finite nature of the process (verb) involved.

Extension involves the addition of some new information by either simple addition, by replacement or by provision of an alternative. For example:

(4a) So the local quack came round
And took one look at me

(b) And we went into a most terrific skid
Grounding two tyres off

In example 4(a), the second clause simply adds more information. A paratactic relationship exists as both clauses are independent. Example 4(b) also involves additional information being supplied in the second clause, but the relationship between the two in this case is hypotactic i.e. the second clause could not stand alone.

Enhancement involves the qualification of one clause by the other—by reference to time, place, manner, cause or condition. Consider the following examples:

(5a) We had absolutely no money at all
So we borrowed a car

(b) Before I realized
I was in an ambulance

Example 5(a) illustrates enhancement through a cause–effect relationship being conveyed. A paratactic relationship also exists as both clauses are independent. Example 5(b) demonstrates enhancement of a temporal nature, but in this case, the tactic relationship is one of hypotaxis and it is the first clause which is the dependent one.

Projection includes the categories of *locution* and *idea*, where either speech or thought is quoted or reported. For example, locutions involve one clause representing a verbal event being projected by another clause of the verbal process type:

(6a) I asked the question
How long am I going to be here?

(b) I said
I would go

Example 6(a) illustrates a paratactic projection of a locution in which direct speech is quoted. Example 6(b), however, represents a hypotactic relationship in which the verbal act i.e. the locution is reported, not quoted verbatim. The following examples illustrate projection of ideas in which a clause representing a mental event is projected by another clause of the mental process type:

(7a) He thinks to himself
Here's a chance to get an easy couple of bob

(b) I remember
The matron used to come around

In 7(a), the thought is quoted in a paratactic fashion, whereas in 7(b), the thought (in this case memory) is reported, not quoted directly.

In a systemic–functional grammar, it is possible to view the potential choices available to the speaker to convey such meanings in the form of a system network (Martin and Halliday 1981; Nesbitt and Plum 1988). Such a network for the choices related to creating meanings through the formation of clause complexes is depicted in Figure 1.

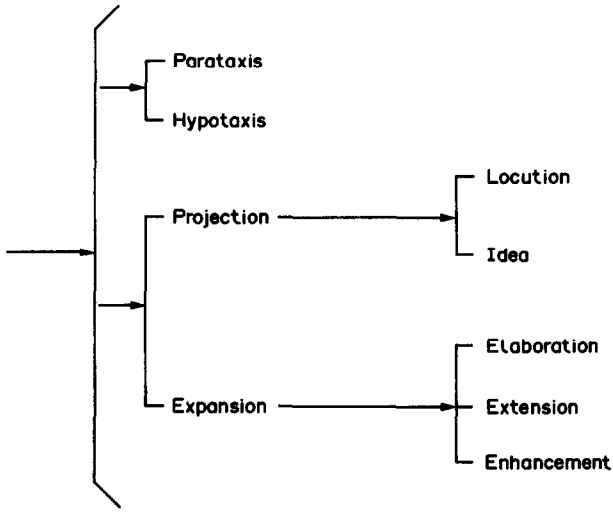

Figure 1.

While the above examples all consist of two clauses linked together, clause complexes can consist of several clauses joined together with no real upper limit. The following extract demonstrates two longer clause complexes produced by normal speaker ED in a text describing his wedding day, when a pre-booked taxi failed to arrive to take him and his best man to the church:

6.1 So I despatched my best man around to the nearby Anzac Highway in Adelaide—a very busy main road
6.2 And said

6.3 Whatever you do
6.4 Come back with a taxi
7.1 And while he was away
7.2 I pushed my motorcycle and side-car out of the shed
7.3 And I kicked it over
7.4 And had the bike warming up

In this extract, two courses of action are being described by ED as alternatives for getting to the church, each making up its own clause complex. Clause 6.2 is connected with 6.1 through paratactic extension. Clause 6.2 then projects (via parataxis) the direct speech quoted in Clause 6.3. Clause 6.3 then links to Clause 6.4 in a hypotactic relationship of enhancement. A conditional relationship exists between the two. That particular clause complex finishes with the end of the projected speech. The next clause complex begins with the speaker then describing preparation of the motorbike as a possible means of transport. Clause 7.1 links with Clause 7.2 through hypotactic enhancement—a temporal meaning being introduced at this point. Clause 7.1 is the secondary clause in this relationship. However, the clause complex is extended by Clause 7.3 adding information to Clause 7.2 and Clause 7.4 adding information to Clause 7.3—all through paratactic extension.

Similar to other aspects of pathological discourse analysis, the aphasic texts analysed were more difficult in parts to analyse than were the normal speaker's. This was accounted for to some extent by some problematic use of conjunction where the logico-semantic intent was difficult to determine. In addition, the high frequency usage of the conjunction 'and' presented difficulties for the analyst. In the narrative genre this was particularly problematic, as it was difficult to determine at what point a clause complex finished, when clauses were linked with 'and'. However, this presented problems in analysis of the normal speaker's texts as well and may indeed reflect the complexity of oral as opposed to written discourse. For example, where a speaker produced a text consisting of clauses predominantly linked by 'and', one could say that the text consisted of one 'super-clause complex'.

In order to address this issue, it was decided that other cues may be used to justify clause complex junctions. These included phonological cues of intonation (falling and rising tones indicating clause complex boundaries) as well as discourse structure cues which indicated that the speaker was progressing to another point in the discourse e.g. from the introduction of participants and setting to the complicating action or resolution. In addition, expressions such as 'well' and 'anyway' were used as indicators of discourse continuance between clause complexes. In the same way that punctuation plays a part in determining clause complex boundaries in written discourse, it was deemed feasible and indeed important to use such oral 'punctuation marks'.

In order to quantify overall use of the above resources by the subjects, the clause complex patterns reported in the study relate to the six texts in total produced by each subject.

RESULTS

The results of the tactic and logico-semantic analysis of the clause complexes are given in Table 2. In terms of taxis, FP demonstrated a predominant use of parataxis—this occurring with 81–89% frequency. This was higher than the frequency found in the normal speaker's texts. ED demonstrated usage of 68% parataxis and 32% hypotaxis. This ratio was almost the same as that found in Nesbitt and Plum's study. Their normal speaker's used parataxis with 70% frequency and hypotaxis 30%. It is interesting to note that FP demonstrated an increase in use of parataxis over the period sampled.

TABLE 2
Frequency of Occurrence of Each of the Tactic and Logico-semantic Relationships Amongst FP's Clauses in Comparison with ED's and Nesbitt and Plum's (N&P) Subjects

	FP (1MPO)	FP (3MPO)	FP (6MPO)	ED	N&P
Parataxis	81%	82%	89%	68%	70%
Hypotaxis	19%	18%	11%	32%	30%
Expansion	96%	96%	92%	85%	84%
Projection	4%	4%	8%	15%	16%

In terms of logico-semantic relations, FP, like ED and Nesbitt and Plum's subjects, used expansion much more often than projection. However, FP used only half the amount of projection and a greater degree of expansion than either of the other samples. Projection was used by both ED and Nesbitt and Plum's subjects at about the same i.e with 15% frequency level — and 16% frequency (Nesbitt and Plum). FP used it around the 4–8% level of frequency.

Table 3 provides further detail of the usage of the various subcategories of projection and expansion. In terms of types of expansion used, FP, like ED and Nesbitt and Plum's subjects used extension the most frequently. Initially, FP's use of extension was higher than ED or Nesbitt and Plum's subjects (FP:59%, ED:48%, Nesbitt and Plum:51%). However, over time, this difference lessened, although the frequency still remained slightly higher in FP's case. Elaboration was also initially

used to similar extents, but as time progressed, FP increased his usage from 22%–33%, whereas ED used it 20% of the time and Nesbitt and Plum's subjects 23%. Enhancement was initially used to a similar extent as elaboration by FP but differential use developed over time, with enhancement being used less often by 6MPO. While Nesbitt and Plum's subjects used elaboration and enhancement with roughly the same frequency, ED used enhancement more often. FP then contrasted with both.

TABLE 3
Frequency of Occurrence of Each of the Logico-semantic Relationships in FP's texts, Compared with ED's and Nesbitt & Plum's (N&P) Subjects

	FP (1MPO)	FP (3MPO)	FP (6MPO)	ED	N&P
Expansion					
Elaboration	22%	26%	33%	20%	23%
Extension	59%	54%	54%	48%	51%
Enhancement	19%	20%	13%	32%	27%
Projection					
Locution	100%	33%	71%	19%	59%
Idea	0%	64%	29%	81%	41%

Given that the actual number of occurrences of projection in both ED's and FP's samples was extremely small, comparing the difference between use of locution projection and idea projection may not be useful. Nevertheless, it was noted that ED projected ideas more often (81%) than locutions (19%) and FP projected locutions more often (in total across samples—with 69% locutions and 31% ideas). Nesbitt and Plum's findings indicated that locutions were projected more often (59%) than ideas (41%).

These figures support the notion of some change in FP's discourse over time in terms of clause complex relations. The most evident changes are in the ratio of parataxis to hypotaxis observed from the 3MPO to the 6MPO point and the gradual increase noted in the use of elaboration and decrease in enhancement between 3MPO and 6MPO. The use of extension decreased slightly between 1 and 3MPO, while a small increase in projection overall was noted, although the latter change may not be significant.

In terms of distribution of taxis with respect to logico-semantic categories, FP demonstrated the same trends as the other subjects. Elaboration and extension were predominantly paratactic while enhancement was usually achieved through hypotactic means. However, there were differences in frequency levels—both across time within

FP's data and between FP's and the other subjects' data. FP's elaboration became increasingly paratactic (from 83% at 1MPO to 100% at 6MPO). Extension remained 100% paratactic throughout the period sampled and enhancement increased from 15% paratactic occurrence at 1MPO to 27% paratactic at 6MPO, with an unexplained 38% level occurring at 3MPO. It is of interest that FP's distribution of elaborative parataxis and hypotaxis was closer to the normal pattern at 1MPO and 3MPO than at 6MPO, with Nesbitt and Plum's subjects demonstrating a 75% paratactic 25% hypotactic distribution and ED a 90% paratactic and 10% hypotactic distribution. Extension distribution was similar for all and FP's enhancement, while initially less paratactic and more hypotactic, reflected the normal subjects' distribution at 6MPO. Again, the occurrence of projection was quite low, but of those instances which did occur, FP's location tended to be projected by parataxis and ideas by hypotaxis, similar to Nesbitt and Plum's findings.

DISCUSSION

In examining FP's ability to create clause complexes, the study was concerned with the meaning resources in this area still available to FP as an aphasic speaker. The results show that in terms of choices available in his system at the degree of delicacy examined, FP had the same range as normals. He was able to use both types of dependency/tactic relations and was also able to use the logico-semantic resources of expansion and projection, along with each of these choices' subcategories of projection of ideas and locutions and expansion by means of elaboration, extension and enhancement. He even used the broad categories in the same type of ratio i.e. he used parataxis more often than hypotaxis and expansion more than projection. Interaction of taxis and logico-semantic relations also followed the same lines for expansion i.e. elaboration tended to be paratactic more often than hypotactic, extension likewise and enhancement the opposite. However, where FP did appear to differ from normal speakers was in terms of the frequency with which certain patterns occurred in his discourse.

Firstly, in terms of tactic relations, FP used a higher proportion of paratactic and a lower proportion of hypotactic relations than normal speakers. In addition, the proportion of parataxis increased over time, rather than decreased as may have been expected, if hypotaxis is thought of as a more complex structural relation. Perhaps the increase in parataxis may be explained in terms of an adjustment strategy. As FP was able to say more (in terms of quantity and experiential meaning), he may have found it easier to simply add independent clauses rather than have to manipulate what would probably have to be increasingly sophisticated structural dependencies.

In terms of logico-semantic relations, the expansion subcategories probably warrant the most discussion, as projection occurred very rarely in either of the subjects examined in this study. FP's higher than normal use of elaboration as time progressed

was firstly of interest. As parataxis may have been less complex for FP to use, elaboration may also have been an 'easier' option, requiring less manipulation of conjunctive devices and time and causal relations required for enhancement. The same explanation may be applied to FP's higher than normal use of extension initially at the 1MPO stage. However, on closer examination of the type of elaboration used by FP, compared with ED, another explanation was also possible. FP tended to use elaboration to re-state rather than to exemplify or add greater specificity, giving more information. Elaboration often appeared to be used to emphasise a particular point or as an apparent correction following an incomplete or problematic clause. In the first case, increasing emphasis it was as if FP was using re-statement as a strategy in the presence of his restricted resources. Consider the following examples:

8. The stroke hit me the left leg
   And hit the right
   Came up the left side
   And hit the right

9. I couldn't speak very much
   I couldn't talk very much

10. Friday Saturday Sunday Monday they hardly fed me
    Didn't didn't even offer me food

In the case of a possible correction strategy, FP seemed aware of a lack of clarity in some of his messages and attempted to be more specific through elaborating, as demonstrated in the following examples.

11. And didn't food me anything
    They more or less...give me...food no food

12. Saturday night we stayed at a youth air...
    Anyway you would stay overnight

13. Friday Saturday Sunday Monday I didn't have any food or...
    I apparently was intervened

His increase in elaboration over time would appear to support this interpretation of a compensatory/self-correction strategy.

Regarding FP's use of less enhancement than the normal speakers, it is difficult to know whether it is the choice of the logico-semantic relationship itself or whether it

is the interaction of hypotaxis and enhancement which is the limiting factor. As enhancement usually occurs through hypotaxis, it may be that FP had greater difficulty constructing hypotactic than paratactic relationships and therefore used enhancement with less frequency because of this. FP demonstrated similar types of enhancement relationships (temporal, causal-conditional) to ED, but simply used them less often. Nesbitt and Plum's data revealed that a statistical association does exist between the taxis and the logico-semantic systems—hence, the choice of features in the other system. It is thus difficult from the results analysed to this point to know the reason for FP's pattern—just where the source for the patterns lie—be it in one system or the other or simply in the interaction of the systems.

These results demonstrate both the similarities and the differences between an aphasic speaker's discourse and that of normal speakers. The similarities represent the preserved strengths and the differences represent both impairment of resources and adjustment of these resources under pathological conditions to communicative demands. While such data on one aphasic speaker is at best preliminary in this area, it promises potentially valuable information on the aphasic speaker's linguistic system and choices available to him following neurological insult to the language centres of the brain.

NOTES

1. This paper was presented as part of a thematic session on Systemic–Functional Analysis of Pathological Discourse conducted at the 19th International Systemic–Functional Congress, held in July 1992 at Macquarie University, Sydney, Australia.
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