

## Measuring service encounters with the traumatic brain injury population

L. TOGHER†‡§, L. HAND†§ and C. CODE†§

† Brain Damage and Communication Research, University of Sydney

‡ Brain Injury Unit, Liverpool Area Health Service, Sydney

§ School of Communication Disorders, Faculty of Health Sciences, University of Sydney

### Abstract

Functional therapy tasks are frequently cited as being important for the successful carry-over of treatment objectives. Service encounters, such as shopping or enquiring for information on the telephone, are typical community integration activities used with the traumatically brain injured (TBI) population. This paper explores the use of systemic functional linguistics in the measurement of performance in service encounters using Generic Structure Potential (GSP) analysis. Results are presented for GSP analysis of service encounters on the telephone to a bus timetable information service, and the police, for five TBI individuals and five matched controls. Service encounters differed according to the complexity of information requested and the interpersonal, or tenor relationships between participants. Differences were evident between TBI and control interactions in the use of generic structural elements. Variation in generic structure was demonstrated across the two types of service encounter. The potential of GSP to measure the dynamic linguistic patterns in everyday TBI interactions is discussed.

### Introduction

This paper reports the use of systemic functional linguistics (Halliday 1985) in the measurement of the global, or *generic* structuring of everyday interactions. This structuring is called Generic Structure Potential (GSP) and has been used to describe casual conversation (Ventola 1979), gossip (Slade 1994) and service encounters (Halliday and Hasan 1985, Ventola 1987). GSP elucidates the linguistic patterning which occurs in spontaneous unstructured contexts, while allowing for an appreciation of the dynamic unfolding of each encounter (Ventola 1987). The emphasis in the rehabilitation of clients with traumatic brain injury (TBI) has shifted towards a functionalist perspective, which favours carry-over and generalization tasks, such as telephone enquiries or shopping encounters (Hartley 1992, Ylvisaker *et al.* 1992).

Current standardized measures of communication function often fail to describe an individual's ability to communicate functionally in real-life contexts (Sohlberg and Mateer 1989). The difficulty with many functional assessment and therapy approaches, however, is a lack of linguistic specificity (Armstrong 1993). Functional approaches have been advocated for a number of reasons. These include

Address correspondence to: Leanne Togher, Brain Damage and Communication Research, School of Communication Disorders, Faculty of Health Sciences, University of Sydney, PO Box 170, Lidcombe, NSW, Australia 2141.

(a) the development of pragmatic models of communication which have provided us with a theoretical basis for understanding language in natural contexts; (b) research has demonstrated the prevalence of impaired functional communication after TBI, where aphasia is absent (Hartley and Jensen 1991, Milton *et al.* 1984); (c) impaired communication/interpersonal skills have been linked to poor long-term social and vocational outcomes after TBI (Oddy 1984, Ben Yishay *et al.* 1987), and (d) funding agencies, insurers and administrators are requiring greater accountability from professionals regarding the functional outcomes of treatment and the cost-effectiveness with which these outcomes are achieved.

The service encounter, in which either goods and services, or information, are procured in a face-to-face interaction or on the telephone, is often cited as a useful functional carry-over task for the TBI patient (Hartley 1992, Ylvisaker *et al.* 1992). Transfer and generalization should include a variation of the contextual aspects of the interaction during training (e.g. people, settings, activities, topics, time) which are as 'real world' as possible (Ylvisaker *et al.* 1992). Measurement of the success and linguistic patterning of service encounters has not been well described. Examining the GSP of service encounters provides the clinician/researcher with another tool to aid the understanding and measurement of such encounters for assessment and therapy purposes.

### Generic structure potential

GSP analysis examines oral texts as *genre*. The concept of genre was borrowed from literary theory and has been used to develop the global structure of interactions in everyday oral texts (Hasan 1984, Martin 1985, 1992, Ventola 1987). Genres in literary terms describe typical realizations of particular types of texts (Hasan 1984, Kress 1982, Martin 1985). Some examples of genres include letters to the editor, appointment making, jokes, interviews and service encounters.

The structural elements of a genre are determined by the field (i.e. activity) and tenor (i.e. participants) of interactions. A task such as making a telephone enquiry will vary according to the type of request made, and the participants involved; however, there is a common core of structural elements. For example, the GSP of a simple telephone enquiry, such as finding out the time in another city, would consist of the elements:

<b>GREETING</b>	Hello Telstra Australia Hello
<b>SERVICE REQUEST</b>	Could you tell me what the time is in Boston in America?
<b>SERVICE ENQUIRY</b>	Do you mean at the moment? Yes
<b>SERVICE COMPLIANCE</b>	Yes it's 5 a.m.
<b>CLOSE</b>	OK Thanks very much
<b>GOODBYE</b>	Bye Bye

The structures of a number of types of normal service encounters have been well described (Hasan 1985, Ventola 1987). The question remains as to whether GSP analysis illuminates the communication disorder of TBI subjects. This study examines two types of telephone service encounters using TBI subjects and matched controls, and asks the following questions:

1. Do TBI subjects differ from control subjects with respect to their use of obligatory and optional elements of the GSP framework in telephone service encounters?
2. Does the GSP differ across two different types of service encounter (i.e. bus timetable information vs. police), where the encounter varies according to tenor (or relationships between speakers (e.g. differences in perceived authority) and complexity of enquiry?
3. Does the GSP analysis provide information regarding the structure of TBI interactions that is not currently available from other analyses?

## Method

### *Subjects*

Subjects were five male TBI adults and five normal adults matched for age, sex and education. TBI subject characteristics can be found in Table 1. Four of the five control subjects were brothers of the TBI subjects. The fifth control subject was a volunteer worker who was matched for age and educational status to the TBI subject. Four TBI subjects were attending a day-centre programme which focused on improving daily-living skills and social and community integration. One subject was involved in an outpatient hospital therapy programme. All TBI subjects were unemployed at the time of the study and had sustained a very severe blunt closed head injury (i.e. post-traumatic amnesia > 24 hours (Russell and Smith 1961) and/or loss of consciousness of > 6 hours (Jennett *et al.* 1977).

Subjects were selected on the basis of inappropriate pragmatic behaviours, as assessed on ratings by two independent speech-language pathologists on the Pragmatic Protocol (Prutting and Kirchner 1987), during a viewing of a videotaped conversation with one of the researchers (L. T.). The 10 behaviours most frequently judged inappropriate in rank order included prosody (all TBI subjects), intelligibility and topic change (4/5 subjects), topic introduction, topic selection and quantity/conciseness (3/5 subjects), and topic maintenance, vocal intensity, specificity/accuracy and facial expression (2/5 subjects). The number of in-

**Table 1. Demographic and clinical details of TBI subjects**

Subject No.	Age (years)	Premorbid occupation	Time since injury (years)	Period of post-traumatic amnesia (months)	Period of loss of consciousness (weeks)	Nature of accident
S1	25	Carpenter	4.25	6	8	Driver in motor car accident
S2	32	Motor mechanic	7.25	> 8	> 2	Fall from cliff
S3	32	Student teacher	11	2-3	8	Pedestrian in motor car accident
S4	29	Apprentice fitter and turner	8	5	10	Motor cycle accident
S5	27	Plant mechanic	1.5	1-2	1	Driver in motor car accident

appropriate behaviours for each of the subjects ranged from six to 11 during the video sessions. Subjects 4 and 5 were noted by judges to have the largest number of inappropriate behaviours, including difficulties with topic management and cohesion.

### Procedure

All subjects made a specific enquiry by telephone to the bus timetable information service in Sydney, and to the police. Subjects contacted the bus timetable service to organize a group outing. This involved obtaining the appropriate bus route, times and the cost involved. The police were contacted to find out the process a person

**Table 2. Elements of GSP structure in bus timetable and police service encounters**

Element	Description	Bus	Police
GREETING (GR)	Caller and information service provider greet each other	Oblig	Oblig
ADDRESS (AD)	Caller and information service provider identify selves or ask for identification e.g. 'What's your name?'	Opt	Opt
SERVICE INITIATION (SI)	'Can I help you?'	Opt	Opt
SERVICE REQUEST (SR)	Makes primary request for information known to service provider	Oblig	Oblig
SERVICE ENQUIRY (SE)	Seeks further information or detail regarding initial SR; can be made by either party	Oblig	Oblig
SERVICE COMPLIANCE (SC)	Response to request for information and invitation for further requests	Oblig	Oblig
CLOSE (CL)	Closing remarks—usually interpersonally oriented, e.g. 'Is that OK?, Thanks very much'	Opt	Opt
GOODBYE (GB)	Final goodbye: 'Bye-Bye'	Oblig	Oblig
CALL FOR ATTENTION (CALL)	Call for attention from either speaker, either due to lack of response, or because speaker was returning to the phone after suspending conversation	Opt	Opt
ACTION (ACT)	Statements of action (e.g. 'I'll just write that down')	Opt	Opt

Oblig = Obligatory element; Opt = Optional element.

### Other elements

	Description
INCOMPLETE/ INAPPROPRIATE (*) UNRELATED (UNR)	Inappropriate or incomplete elements either because of delayed responding or a lack of response Comments or enquiries which are unrelated to the task at hand
PERSONAL COMMENT (PERSONAL)	Comments of a personal nature which, while not directly relevant to the information-seeking task, appear to fulfil an interpersonal function (e.g. 'You're not nervous about driving are you?')
REPITITION (rpt)	Elements which are repeated due to misunderstanding; failure to take in information or forgetting of information

with a TBI needs to go through to have a driver's licence reinstated. Both tasks were requests for information from an unfamiliar person; however, there were two main differences between them. First, the bus timetable enquiry was complicated, whereas the police enquiry was a more straightforward request. Secondly, the bus timetable person was not an authority figure, whereas the policeman had some authority over the person making the call. All subjects were aware that they were being recorded; however, the bus timetable information service and the police were not informed as to whether they would receive calls from TBI or normal subjects. Telephone calls were tape-recorded and transcribed verbatim. Data were analysed using Generic Structure Potential (GSP) analysis.

*The Generic Structure Potential (GSP) analysis (from Hasan 1985)*

First, transcripts were divided into *moves*. A move is a semantic unit of information which is the smallest unit of potentially negotiable information presented by one speaker within one turn of interactive talk (Eggins 1990). GSP analysis involves scoring groups of moves according to the type of generic element being expressed. It is made up of obligatory and optional elements (Table 2). The dynamic nature of the analysis is described in the Appendix. The mean percentage of moves which composed each structural element was computed. This enabled comparison of TBI vs. control subjects and bus vs. police conditions. Inter-judge and intra-judge reliability of the GSP analysis was established. Inter-rater reliability was established by point-by-point agreement on 25% of the transcripts. Transcripts were selected so that both TBI and control samples were represented across both the police and bus timetable conditions. The entire transcript was scored on each occasion. Inter-observer agreement for the analysis of generic structural elements between the researchers (L. T. and L. H.) was 90.4%, ranging from 80% to 100%.

## Results

### *Bus timetable condition*

TBI subjects were involved in longer greeting sequences than controls for both the bus and police conditions (Table 3). They also produced incomplete and inappropriate greetings (marked with an asterisk), due to false starts, inattention or being overfamiliar (such as 'how ya going mate?') (Examples 1 and 2). This occurred in 56% of the GREETING moves in the bus condition and 40% of the time in the police condition (Table 4). The key to the definitions of the generic structural elements and associated abbreviations can be found in Table 2.

**Example 1:** S2—Bus timetable condition. INAPPROPRIATE GREETING  
B = Bus timetable person, S = subject.

*Moves 1 and 2*

1. GR B: Hello Bus and Ferry info line\_\_\_\_\_speaking
2. GR\* S: Oh hang on a sec  
What do I ask?

**Example 2:** S4—Bus timetable condition. INAPPROPRIATE GREETING  
*Moves 1–5*

1. GR B: Bus and Ferry Info line (unintell.) speaking. Can I help you?
2. GR\* S:...

**Table 3. Mean percentage of moves by TBI and control subjects in each element of the GSP network for the bus timetable and police conditions**

Elements of GSP	Mean percentage of moves in each element of the GSP			
	TBI subjects		Control subjects	
	Bus condition (N = 5)	Police condition (N = 4)	Bus condition (N = 5)	Police condition (N = 4)
Greeting	8.0	5.0	4.0	0.5
Address	0.6	6.75	0.2	3.25
Service initiation	0	0.75	0	0.25
Service request	12.0	13.25	13.0	14.0
Service enquiry	31.0	24.75	42.4	38.5
Service	26.0	33.0	29.2	26.75
<i>Compliance</i>				
Closing	10.0	9.25	5.2	12.5
Goodbye	5.0	1.75	4.6	4.25
Call/action	4.8	2.75	1.4	0
Unrelated	4.0	2.5	0	0

**Table 4. Mean percentage of aberrant moves within each structural element for bus and police conditions**

Generic structure element	Bus timetable condition		Police condition	
	TBI (N = 5)	Controls (N = 5)	TBI (N = 4)	Controls (N = 4)
<i>Greeting</i>	(n = 9)	(n = 15)	(n = 15)	(n = 1)
Inappropriate/incomplete	56%	0	40%	0
<i>Address</i>	(n = 1)	(n = 1)	(n = 21)	(n = 6)
Inappropriate/incomplete	0	0	76%	0
<i>Service request</i>	(n = 20)	(n = 34)	(n = 43)	(n = 97)
Inappropriate/incomplete	10%	0	56%	0
Repetition	30%	0	9%	0
<i>Service enquiry</i>	(n = 88)	(n = 161)	(n = 81)	(n = 97)
Inappropriate/incomplete	0	0	5%	0
Repetition	1%	0	15%	0
Personal	0	0	26%	0
<i>Service compliance</i>	(n = 71)	(n = 65)	(n = 114)	(n = 54)
Repetition	14%	0	19%	0
<i>Call</i>	(n = 6)	(n = 2)	(n = 7)	(n = 0)
Inappropriate/incomplete	33%	0	29%	0
<i>Close</i>	(n = 17)	(n = 12)	(n = 27)	(n = 28)
Inappropriate/incomplete	12%	0	7%	0
Personal	0	0	22%	0

N = number of subjects; n = total number of moves in each structural element.

3. B: Hello?
4. S: Hi
5. B: Hi

The mean percentages of moves in the Service Request (SR) and Service Compliance (SC) elements were similar between TBI and controls; however the nature of these elements differed qualitatively. Inappropriate or incomplete elements (10% of total SR moves) and repetition of elements (30% of SR moves) occurred in TBI interactions, whereas they did not occur in control samples (Table 4). Despite this, Service Compliance (SC) occurred in all TBI encounters. The cooperative nature of information exchange is demonstrated in Example 3, where the bus timetable person compensates for the incomplete Service Request (SR) by the TBI subject.

**Example 3: S3—Bus timetable. INCOMPLETE SR, SE BY BUS**  
*Moves 3–14*

3. SR\* S: I'd like some information please concerning buses
4. B: Mm Mm?  
S: Yeah from what station Leanne? (to researcher)
5. SE by B B: Where are you going?
6. S: Strathfield station
7. B: Chatswood?
8. S: No from Strathfield
9. B: [Strathfield mm
10. S: to the Macquarie Centre
11. B: oo(glottal fry) um...
12. SR (rpt) S: What bus would I take from Strathfield station
13. B: [Yeah
14. S: to the Macquarie Centre?

The highly complicated nature of this task required a succinct SR at the beginning of the interaction, and use of numerous service enquiries (SEs) to elicit details about the main enquiry. Control subjects demonstrated this pattern with a clear SR, followed by SEs. Control interactions were characterized by a larger percentage of moves in the SE element than in TBI interactions (Table 3). SEs were used to clarify and check information, rather than to gain further details. Bus timetable people also used SEs to enable them to provide the required information. In the case of one TBI subject (S2), the bus timetable person initiated most of the SEs, with S2 making only one SE. All subjects negotiated the Close/Goodbye element; however, in TBI interactions, these elements were longer than in the controls (Table 3). Example 4 demonstrates this, with S2 engaging in a prolonged farewell sequence.

**Example 4: S5—Bus timetable condition. EXTENDED CLOSING SEQUENCE**  
*Moves 99–108*

99. CL B: Great OK then
100. B: Alright well that looks like that should do the trick
101. S: Yeah and that means you're a very tricky bloke
102. B: That's right (laughs)
103. S: Thanks a lot for your help

104. CL B: OK Well have a good day  
 105. S: I hope you do too  
 106. B: Thank you very much  
 107. GB S: Bye bye  
 108. B: Bye bye

*Features unique to TBI interactions*

TBI subjects demonstrated two further features which did not occur as frequently in control interactions. These were unrelated comments (UNR) (Example 5) and the need to call for attention (CALL) (Example 6).

**Example 5:** S2, Bus timetable condition. UNRELATED COMMENT  
*Moves 61–70*

61. UNR S: Sounds like you've got a lot of paper work.  
 62. B: Yeah we have.  
 63. B: We've got ah all the buses on computer,  
 64. B: but we've got the trains on the on you know timetables, yeah,  
 65. B: so they take a bit of juggling around and keeping in order on your desk  
 66. S: And if you're going from one to the other  
 67. B: That's right yeah  
 68. B: that's right exactly  
 69. S: You'd wind up getting rid of the paper  
 70. B: Yes that's right

**Example 6:** S5—Bus timetable condition. CALL FOR ATTENTION  
*Moves 42–45*

42. SE B: Right there's one at 11.30 that arrives at 12.18  
 (.)  
 43. CALL B: Hello?  
 44. S: Yeah I'm here  
 45. SE (rpt) B: Yeah there's one at 11.30 arriving 12.18

*Police condition*

The police condition appeared to be more problematic than the bus timetable condition for all TBI subjects, even though the enquiry was a more straightforward one. Difficulties may have been related to the unequal interpersonal relationship in this encounter (Togher *et al.* 1996). All obligatory elements were present in both TBI and control interactions. Similar to the bus timetable condition, however, all TBI interactions exhibited inappropriate or incomplete generic elements.

The GR element of all TBI interactions was marked by the necessity for identification (AD). One of the TBI subjects (S2) gave his name at the beginning of the interaction and in the other three cases subjects were asked for their name by the police officer. Control subjects were never asked for their name but three introduced themselves. In contrast, none of the subjects gave or were required to give their name in the bus timetable condition. This requirement appeared to be a reflection of the unequal tenor relationship in the police condition. The mean percentage of moves in the GR element was greater in the TBI interactions when



compared with controls (Table 3). Controls negotiated a brief greeting, introduced themselves and then moved directly to the SR, perhaps to establish their credibility early in the call. TBI subjects negotiated longer GR sequences which were inappropriate and delayed by other elements, such as statements of action. The SR was delayed and inappropriate in all TBI interactions. In some cases the police officer initiated the SR after extended GR sequences.

As the enquiry in this encounter was a relatively straightforward one, it was expected that fewer SEs would occur than in the bus timetable condition. This assumption was supported in control interactions, with fewer SEs occurring in the police condition than the bus condition (Table 3). Nonetheless, a larger proportion of SEs occurred in the control interactions when compared with the TBI interactions. TBI subjects used the SE to check on information already provided, while control subjects asked for extra information. Police also used this generic structural element to check that the information they had provided to the TBI subjects was clear (Example 7).

**Example 7:** S4, Police condition. CHECKING BEHAVIOUR BY POLICE

*Moves 33–38*

P = Policeman, S = subject.

33. SE (by P) P: You know all that do you?  
 34. S: Yeah  
 35. P: So the main thing  
 36. S: [I've seen many therapists  
 37. P: Yeah I suppose you do,  
 38. S: (laughs)

*Elements unique to TBI interactions*

In two TBI interactions (S4 and S5), both police and subjects discussed personal topics. S5 made a number of unrelated (UNR) (Example 8) and personal comments (PERSONAL) which did not fit into the GSP network (Example 9). Failure to respond to calls for attention were also unique to TBI interactions.

**Example 8:** S5, Police condition. UNRELATED COMMENT

*Moves 81–95*

81. SC P: But the main thing is R. is that it's just gotta go through the Commonwealth Rehab  
 82. S: Commonwealth Rehab  
 83. P: Yeah,  
 84. P: and ah you know they are, they[provide  
 85. UNR S: [I've got a lot of Aboriginal mates  
 86. P: Yeah  
 87. S: In the service  
 88. P: Yeah, oh yeah  
 89. S: Ah, they're older men  
 90. SC (rpt) P: Yeah and just go to Cumberland College for the test  
 91. P: and [then you're right  
 92. S: [Cumberland College  
 93. P: Yep,

94. P: and then you're right  
 95. P: you will get a driver's licence

**Example 9:** S5, Police condition. PERSONAL COMMENT  
*Moves 104–114*

104. SE<sub>(PERSONAL)</sub> P: But you're not nervous are you?  
 105. S: Um not at the moment no  
 106. P: No you'll be right  
 107. S: [I'm not in any trouble  
 108. P: No no no no  
 109. S: [I'm used to being in trouble  
 110. P: But you'll be right  
 111. P: just take your time  
 112. S: [I was a bit of a bastard of a kid  
 113. P: Yeah, just take your time  
 114. P: and be careful

All TBI interactions were closed appropriately but were qualitatively different from the controls. Control subjects engaged in longer CL and GB sequences than the TBI subjects (Table 3). This may be interpersonally driven. Opening and closing elements reflect the development of interpersonal relationships, by initially establishing credibility and, finally, by confirming the success of the encounter, as well as encouraging future contact. In all control interactions the police officer encouraged subjects to call again. The interpersonal relationship was therefore reinforced by a longer closure than in the TBI interactions.

### Discussion

In our introduction we asked whether TBI subjects differed from control subjects with respect to their use of the obligatory and optional elements in the GSP framework in telephone service encounters. The GSP of TBI interactions was different from the GSP of control interactions across both conditions. While TBI interactions evidenced the obligatory elements, there were differences in the proportion of moves used to gain the target information. TBI subjects appeared to be less able to judge the interpersonal and content requirements of the two types of service encounters. This was reflected by the prolonged GR sequences in both conditions; the need for repetition and incomplete/inappropriate elements, and shorter CL elements with the police. Possibly the longer GR sequences in TBI interactions influenced the remainder of their encounters. For example, the prolonged GR sequences in the TBI-police samples may have precipitated the shorter CL sequences, due to a failure in establishing credibility. The police may not have been comfortable with establishing the same type of interpersonal relationship as they did with control subjects. Police behaved differently with TBI subjects, with demands for identification, and requests for personal information in two cases. The presence of inappropriate, incomplete and unrelated elements was unique to the TBI encounters. Milton *et al.*'s (1984) statement that TBI patients talk better than they communicate is supported here.

We also asked whether differences occurred according to the type of service encounter and the complexity of the enquiry. The GSP was noted to vary between two different types of service encounter. This was related to the complexity and

interpersonal requirements of the task. The more complex enquiry in the bus timetable condition resulted in a larger number of SEs than in the police condition. The unequal authority status in the police condition resulted in a larger number of moves being devoted to interpersonal elements. The necessity for personal introductions, and provision of personal information, in the case of the TBI subjects, and the longer closing elements of the control interactions, indicating solidarity, reflected this.

Finally, we wanted to know whether GSP analysis gave information regarding the structure of TBI interactions that is not available from currently available analyses. GSP analysis provided new information about TBI service encounter interactions. It was sensitive to the nature of the service encounter, with regard to the complexity of the enquiry being made, and the interpersonal relationships which were established. Traditionally, telephone proficiency has been measured by a static checklist of features, or a list of agencies which TBI clients need to contact (Hartley 1992). Shopping visits are judged with regard to the client's success in finding and procuring items, and being 'appropriate' during the service encounter. GSP analysis provides a detailed view of the dynamic linguistic patterns which unfold in these types of encounters. GSP enables one to predict the complexity of structural requirements of a service encounter task, given the choice of communication partner and the amount of goods and/or services being requested. It offers an alternative way of viewing 'functional' tasks, as well as a promising framework for researchers to investigate the elusive communication problems which follow TBI.

It should be noted that the bus timetable people and the police may have been responding both to the nature of the person with TBI's responses as well as to the sound of their voices. All TBI subjects were judged as evidencing inappropriate prosody on the pragmatic protocol, although to be a subject in the study they were required to evidence intelligible speech. Impaired prosody and intelligibility may have been important factors; however, the extent to which they affected the nature of partners' responses cannot be derived from this study. This raises the issue for further examination of which aspects of the person with TBI's presentation may ultimately result in them being penalized in a service encounter.

Service encounters account for a significant amount of everyday communication exchanges for most of us. Therapy which focused on service encounters has the potential to have a significant impact on the communicative effectiveness of people with TBI. Examining service encounters can be logically extended to the way we work with people with TBI to communicate more effectively, as well as to the education of others who are in service industries, and who need to deal with the public. The structural elements of the GSP model offer the clinician some direction in focusing the person with TBI on problem areas (such as during the GREETING or SERVICE REQUEST). The provision of cues such as written cards, and practising with the clinician before phoning, could potentially help people with TBI to hone their skills. It would also be possible to provide predetermined non-verbal signals (such as a wind-up signal) during a call to the client if they were producing inappropriate remarks or repeating themselves. Practice on the telephone is a clinically practical task. Service encounters could also be trained outside the clinic room (e.g. a number of different service encounters could be incorporated into a shopping outing). The service encounters could be varied according to the complexity of the request, the speed at which the encounter would need to occur (e.g. time pressure

in a crowded shop vs. an empty shop), the mode of the interaction (i.e. spoken only, written only or a combination of spoken and written, e.g. bank transactions), and the field and tenor of the interaction (e.g. buying goods from a grocery store compared with making an enquiry to a government department).

This raises questions about what constitutes a 'normal' service encounter. The structure of service encounters has been well described (Hasan 1985, Ventola 1987). These outline the expected sequence of events and the normal recursion and variation of generic structural elements that can be expected. This study compared TBI subjects with matched controls to attempt to quantify in some way the interpersonal communication differences which typify TBI interactions. The differences found in the TBI interactions (such as incomplete, absent or repeated elements) were viewed as not conforming to the model suggested by Hasan (1985). This model can therefore assist the clinician to decide on which elements to work on. Goals could include eliminating inappropriate or repeated elements, or including elements which had been deleted. The important aspect of this analysis is the notion of the flexibility of the system, while at the same time recognizing that there are obligatory elements which must be present for the service encounter to be successfully completed.

Improving communication in government agencies, private organizations and in those dealing with the public generally is becoming increasingly relevant. Recent years have heralded an increased awareness of people with disability with the development of training programmes for 'uniformed' sections of the community (e.g. police) to address communication and empowerment (e.g. Brennan and Brennan 1994). This research would suggest that training of community and service agencies may be appropriate and effective. For example, members of the police service may benefit from increased awareness of the effects their power imbalance may have on interactions, particularly when they are dealing with people who are communicatively impaired.

The findings are on a small sample of TBI subjects, and should be viewed with caution. Replication of these data using larger subject numbers would help us to determine whether such findings are characteristic of TBI subjects in general.

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### References

- ARMSTRONG, E. M. (1993) Aphasia rehabilitation: a sociolinguistic perspective. In A. L. Holland and M. M. Forbes (Eds) *Aphasia Treatment: World Perspectives* (Singular, San Diego, CA), pp. 263-290.
- BEN-YISHAY, Y., SILVER, S. S., PIASETSKY, E. and RATTOK, J. (1987) Relationship between employability and vocational outcome after intensive holistic cognitive rehabilitation. *Journal of Head Trauma Rehabilitation*, 2, 35-48.

- BRENNAN, M. and BRENNAN, R. (1994) *Clartalk: police Responding to Intellectual Disability* (Charles Sturt University Press, Wagga Wagga).
- EGGINS, S. (1990) Keeping the conversation going: a systemic-functional analysis of conversational structure in casual sustained talk. Unpublished PhD thesis, University of Sydney.
- HALLIDAY, M. A. K. (1985) *An Introduction to Functional Grammar* (Edward Arnold, London).
- HALLIDAY, M. A. K. and HASAN, R. (1985) *Language, Context, and Text: Aspects of language in a social-semiotic perspective* (Deakin University Press, Victoria).
- HARTLEY, L. L. (1992) Assessment of functional communication. *Seminars in Speech and Language*, 13, 264-279.
- HARTLEY, L. L. and JENSEN, P. J. (1991) Narrative and procedural discourse after closed head injury. *Brain Injury*, 5, 267-285.
- HASAN R. (1984). The nursery tale as a genre. *Nottingham Linguistic Circular*, 13 (Special Issue on systemic linguistics), 71-102.
- HASAN, R. (1985) The structure of a text. In M. A. K. Halliday and R. Hasan, (Eds) *Language, Context, and Text: Aspects of language in a social-semiotic perspective* (Deakin University Press, Victoria), pp. 52-118.
- JENNETT, B., TEASDALE, G., GALBRAITH, S., PICKARD, J., GRANT, H., BRAAKMAN, R., AVEZAAT, C., MAAS, A., MINDERHOUD, J., VECHT, C. J., HEIDEN, J., SMALL, R., CATON, W. and KURZE, T. (1977) Severe head injuries in three countries. *Journal of Neurology, Neurosurgery and Psychiatry*, 40, 291-298.
- KRESS, G. R. (1982) *Learning to Write* (Routledge & Kegan Paul, London).
- MARTIN, J. R. (1985) *Factual Writing: exploring and challenging social reality* (Deakin University Press, Victoria).
- MARTIN, J. R. (1992) *English Text: System and Structure* (Benjamins, Amsterdam).
- MILTON, S. B., PRUTTING, C. A. and BINDER, G. M. (1984) Appraisal of communicative competence in head injured adults. In R. H. Brookshire (Ed.) *Clinical Aphasiology Conference Proceedings* (BRK, Minneapolis, MN), pp. 114-123.
- ODDY, M. (1984) Head injury and social adjustment. In N. Brooks (Ed.) *Closed Head Injury: Psychological, social and family consequences* (Oxford University Press, New York), pp. 108-122.
- PRUTTING, C. A. and KIRCHNER, D. M. (1987) A clinical appraisal of the pragmatic aspects of language. *Journal of Speech and Hearing Disorders*, 52, 105-119.
- RUSSELL, W. R. and SMITH, A. (1961) Post-traumatic amnesia in closed head injury. *Archives of Neurology*, 5, 4-17.
- SLADE, D. (1994) Two complementary perspectives on the analysis of casual conversation in English. *Australian Review of Applied Linguistics*, Series S 11, 47-82.
- SOHLBERG, M. M. and MATEER, C. A. (1989) The assessment of cognitive-communicative functions in head injury. *Topics in Language Disorders*, 9, 15-33.
- TOGHER, L., HAND, L. and CODE, C. (1996) A new perspective in the relationship between communication impairment and disempowerment following head injury in information exchanges. *Disability and Rehabilitation*, 18, 559-566.
- VENTOLA, E. (1979) The structure of casual conversation in English. *Journal of Pragmatics*, 3, 267-298.
- VENTOLA, E. (1987) *The Structure of Social Interaction: a systemic approach to the semiotics of service encounters* (Pinter, London).
- YLVISAKER, M., URBANCZYK, B. and FEENEY, T. J. (1992) Social skills following traumatic brain injury. *Seminars in Speech and Language*, 13, 308-321.

### Appendix: Generic structure potential analysis

The elements which are scored in GSP analysis appear in Table 2. Hasan (1985) developed a formula whereby these elements may be recurring and optional. This allows for analysis of the dynamic nature of spontaneous interactions. Hasan's (1985) analysis has been adapted to account for a service encounter where *information* (rather than goods) is being exchanged so that:

[<GREETING>●(SERVICE INITIATION) ^ ] [(SERVICE ENQUIRY ← ●) {SERVICE REQUEST ^ SERVICE COMPLIANCE}] ^ CLOSING ^ GOODBYE.

- ( ) = OPTIONALITY  
 [ ] = LIMITATION FOR MOBILITY  
 ● = A MOBILE ELEMENT  
 ← = RECURSIVENESS (Hasan 1985/Martin 1992)  
 { } = HOMOGENEOUS RECURSION (Hasan)  
 ^ = FIXED SEQUENCE

For example, in the first bracket the Greeting (GR) is obligatory, but may be preceded by a Service Initiation (SI) (e.g. 'Can I help you?'). The square brackets indicate that this sequence must precede the service enquiry. (G) and (SI) cannot follow the elements to the right of (SI). Angled brackets (< >) indicate that an element may be embedded within another element, e.g. a GREETING embedded in a SALE INITIATION. The optional elements are within parentheses. The carets (^) indicate the sequence of structural elements. The dot and arrow next to Service Enquiry (SE) indicate (a) that SE is optional; (b) SE can occur anywhere, as long as it does not precede G or SI, or follow Close (CL) or Goodbye (GB). The braces {} indicate that the degree of repetition (or iteration/recursion as termed by Hasan 1985) for elements within the braces is equal. For example if SR occurs twice, then SC must occur twice.

Thus, once the data have been marked for individual elements, the structure of that interaction can be described by placing the elements in the sequence in which they appear. The number and order of structural elements can then be evaluated according to the field and tenor configuration of that interaction.