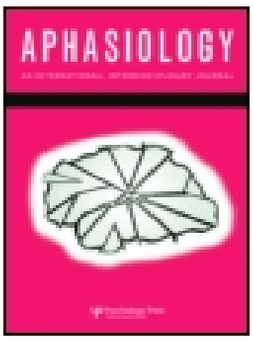

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Conversational discourse in closed-head-injured and non-brain-injured adults

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Background: Functional communication requires proficiency in the adaptation of language to varied contexts. Recent research has demonstrated that individuals with traumatic brain injury (TBI) experience difficulty with communicative effectiveness across a variety of discourse genres. Analysis of conversation following TBI is of particular interest because of its importance in the process of socialisation. The development and maintenance of social relationships has been noted to be difficult for individuals with TBI. It has been suggested that these interactional difficulties are the result of social skills deficits which may be a reflection of impaired language use. A variety of analyses have been applied to samples of conversation from individuals with TBI. These analyses have included pragmatic rating scales, exchange structure analysis, Conversation Analysis, as well as measures of topic initiation, topic maintenance, and response appropriateness. Overall, individuals with TBI have been noted to have difficulties with topic management and expressing information in a logical fashion. Further, their conversations have been rated as less interesting, less appropriate, and more effortful.

Aims: The present study sought to validate the clinical utility of Blank and Franklin's (1980) procedure for analysis of conversation with larger groups of TBI and non-brain-injured individuals.

Methods & Procedures: The examiner engaged 32 closed-head-injured (CHI) and 43 non-brain-injured adults in individual conversations. The conversational performance of each participant, as well as the examiner, were analysed for various dimensions of response appropriateness and topic initiation.

Outcomes & Results: Results indicated that the individuals with CHI were dependent on the examiner to maintain the flow of the conversation and that they often contributed information that did not facilitate the social interaction. It was also noted that the examiner compensated by asking more questions and introducing more topics in conversations with the individuals with CHI. In contrast, the conversations with the non-brain-injured controls were characterised by a shared responsibility for sustaining the interactional flow.

Conclusions: In general these findings are consistent with previous investigations of conversational skills of individuals with TBI. Blank and Franklin's analysis procedure for conversation did delineate differences between the participant groups and in the examiner's performance when interacting with these individuals. However, it is important to note that

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the tenor of the conversational interactions (i.e., the status and roles of the participants) may have constrained the individuals with CHI and therefore their apparent dependence on the examiner may not have been solely the result of their brain injuries.

Functional communication requires language competence in a variety of settings ranging from informal social interactions to formal educational or work-related tasks (Snow, Douglas, & Ponsford, 1997). Recent investigations have demonstrated that individuals with traumatic brain injuries (TBI) experience difficulty with communicative effectiveness across a number of discourse production genres (see Coelho, 1995, for a review). The analysis of conversational discourse is of particular interest for the study of the TBI population because of its importance in the process of socialisation. The development and maintenance of social relationships has been noted to be challenging for survivors of TBI. The consequences of this difficulty are social isolation, increased reliance on family for social support, and significant problems returning to work, school, and premorbid avocations. It has been suggested that these interactional problems are the result of social skills deficits, and that these deficits in social skills are felt to be a reflection of subtle impairments in pragmatic language use during conversation (Bond & Godfrey, 1997; Godfrey & Shum, 2000).

A variety of analyses have been applied to the conversational samples from individuals with TBI. These analyses have ranged from pragmatic rating scales and checklists (Ehrlich & Barry, 1989; Milton, Prutting, & Binder, 1984; Newton & Johnson, 1985; Snow et al., 1997) to formal highly structured analyses such as generic structure analysis and exchange structure analysis, based on Halliday's (1994) Systemic Functional Linguistics (Togher, Hand, & Code, 1999) or Conversation Analysis (Friedland & Miller, 1998). Other analysis procedures have examined topic initiation and response appropriateness (Coelho, Liles, Duffy, & Clarkson, 1993), topic management (Coelho et al., 1993; Mentis & Prutting, 1991), and compensatory strategies (Penn & Cleary, 1988). In general, these analyses have indicated that individuals with TBI have difficulties with topic management, turn taking, and expressing information in a logical fashion. Further, conversations involving individuals with TBI have been rated as less interesting, less appropriate, and more effortful than conversations with non-brain-injured controls (Bond & Godfrey, 1997).

The importance of addressing the conversational discourse deficits of individuals with TBI is emphasised by the findings of Snow and colleagues (1998). These investigators conducted a follow-up study of a group of individuals with TBI who were at least 2 years post onset of injury. Results indicated that their conversational skills did not improve over time without treatment. Furthermore, a modest association was also reported between a measure of psychosocial handicap (i.e., The Craig Hospital Assessment and Reporting Technique) and conversational performance. The authors conclude that this may account for ''a contracted and diminishing social circle in the longer term.''(Snow & Douglas, 1999, p.301).

The notion of appropriateness within conversation has been considered in the psychiatric literature because its absence is viewed as an important factor in the interpersonal difficulties of both psychotic and neurotic individuals (Blank & Franklin, 1980). To our knowledge only one previous study has addressed this issue objectively in the assessment of brain-injured individuals. Coelho et al. (1993) examined conversations of five individuals with TBI, five individuals with aphasia, and five non-brain-injured controls using Blank and Franklin's (1980) procedure for evaluating appropriateness within a conversation. The proficiency by which participants manage conversational

topics is critical to the success of an interaction, therefore topic management abilities were also examined in that study. Topic management pertains to how participants in a conversation extend or maintain a given topic, as well as how discussion of a topic is discontinued, and how and when participants change topics (Brinton & Fujiki, 1989). Results indicated that the individuals with TBI had more turns, shorter utterances, decreased response adequacy, as well as difficulty initiating and sustaining topics. These findings suggested this analysis to be promising for delineating distinctions in conversational performance across groups.

The present study sought to validate the clinical utility of Blank and Franklin's procedure for analysis of conversational abilities of larger groups of TBI and non-brain-injured individuals. In addition this study sought to investigate the degree to which the findings of the Coelho et al. (1993) study could be generalised across larger groups of individuals with TBI.

METHOD

Participants

CHI. A total of 32 native speakers of English who had sustained a closed head injury (CHI) were studied (See Table 1 for demographic characteristics of this group.) Participants with CHI were recruited from three rehabilitation hospitals in Connecticut, Rhode Island, and New York. Participants with CHI were selected because they had recovered a high level of functional language—that is, they had achieved fluent conversation and did not demonstrate any significant deficits on traditional clinical language tests.

All individuals with CHI met the following criteria: (a) no reported history of substance abuse or psychiatric illness; (b) no significant visual acuity or visual perceptual deficits; (c) no significant hearing loss; (d) an aphasia quotient (AQ) from the *Western Aphasia Battery* (Kertesz, 1982) above 93; (e) no significant motor speech disorder as determined by an experienced speech-language pathologist; (f) Rancho Los Amigos Level of Cognitive Functioning (Hagan, Malkmus, & Durham, 1980) of VII (automatic-appropriate) or above; (g) *Galveston Orientation and Amnesia Test* (Levin, O'Donnell, & Grossman, 1979) score of 75 or above; and (h) a score of 120 or above on the *Dementia Rating Scale* (Mattis, 1976) a general screen of cognitive processing. The group of individuals with CHI consisted of 8 females and 24 males ranging in age from 16–69 years (mean = 31.7 years). Four members of the group were African-American and the remainder Caucasian. Years of education ranged from 10–21 (mean = 13.2 years). Participants with CHI were also assigned to one of three groups: Professional, Skilled Worker, or Unskilled Worker, on the basis of the Hollingshead rating (Hollingshead, 1972) (as described in the Appendix). The CHI group consisted of 11 professionals, 10 skilled workers, and 11 unskilled workers. The most consistently available index of severity of injury was duration of coma (DOC). Although this information could not be obtained for four individuals with CHI, for the remaining 28 participants DOC ranged from less than 1 day to 90 days (mean = 14.1 days). Time post onset of injury ranged from 1–99 months (mean = 12.8 months). With regard to severity of injury, Lezak (1995) classifies TBI with a DOC over 6 hours as severe, less than 6 hours as moderate, and 20 minutes or less as mild. On the basis of this classification system, the severity of the injuries of the participants with CHI from the present study were rated as being either moderate or severe. This was comparable to the five individuals with TBI from the Coelho et al. (1993) study.

Non-brain-injured. A total of 43 hospital employees, working in a variety of capacities, who were native speakers of English served as the control group (see Table 2). No individual in this group had a reported history of neurologic or psychiatric disease or substance abuse. Attempts were made to match these individuals, as closely as possible, with the individuals with CHI on the basis of age, gender, race, socioeconomic status, and education. There were 13 females and 30 males studied, ages ranged from 16–63 years old (mean = 31.9 years). Of the non-brain-injured controls 2 were African-American and 41 Caucasian. Years of education ranged from 11–24 (mean = 15.3 years). With regard to

TABLE 1
Demographic characteristics of 32 closed-head-injured (CHI) participants

Subject	*Gender*	*Age*	*Race*	*EDUC*	*SES*	*DOC*	*MPO*
1	M	21	C	10	USK	4	8
2	M	30	C	12	SK	7	2
3	F	20	C	12	USK	21	3
4	M	49	C	21	P	1	2
5	M	47	C	18	P	10	2
6	M	16	C	10	USK	3	1
7	M	27	AA	12	SK	1	2
8	M	29	AA	12	USK	14	2
9	M	28	C	12	USK	7	1
10	F	28	C	12	USK	0	2
11	M	24	C	13	SK	24	9
12	M	22	C	16	P	4	2
13	M	54	C	16	P	0	33
14	F	16	C	11	P	0	8
15	M	19	C	12	SK	?	1
16	M	42	C	16	P	?	2
17	M	17	C	11	SK	7	4
18	F	33	C	15	P	8	12
19	F	21	C	11	USK	7	1
20	M	60	C	12	SK	21	28
21	M	31	C	12	USK	28	29
22	M	47	C	18	P	0	12
23	F	18	C	12	SK	35	8
24	F	69	C	13	SK	28	75
25	M	34	C	13	SK	42	99
26	F	40	C	16	P	?	26
27	M	18	AA	12	P	2	2
28	M	55	C	18	P	1	1
29	M	29	C	10	USK	?	7
30	M	27	AA	12	SK	10	1
31	M	19	C	10	USK	90	18
32	M	25	C	12	USK	21	8
Mean		31.7		13.2		14.1	12.8
	8 F 24 M		4 AA 28 C		11 P 10 SK 11 USK		

EDUC = years of education, SES = socioeconomic status as rated with the Hollingshead scale (P = professional, SK = skilled worker, USK = unskilled worker), AA = African-American, C = Caucasian, DOC = duration of coma in days (0 = less than 24 hours, ? = information on DOC was unavailable), MPO = months post onset of injury.

TABLE 2
Demographic characteristics of 43 non-brain-injured participants

Subject	*Gender*	*Age*	*Race*	*EDUC*	*SES*
1	M	63	C	12	SK
2	M	18	C	12	USK
3	F	22	C	12	USK
4	F	23	C	12	USK
5	M	28	C	11	USK
6	F	46	C	18	P
7	F	22	C	17	P
8	F	22	C	16	SK
9	F	56	C	13	SK
10	M	32	AA	12	USK
11	M	26	C	12	USK
12	M	61	C	12	USK
13	M	31	C	14	USK
14	M	46	AA	11	USK
15	M	43	C	12	USK
16	M	25	C	11	USK
17	M	26	C	12	USK
18	F	26	C	12	USK
19	M	28	C	11	USK
20	M	33	C	12	USK
21	F	19	C	12	USK
22	M	25	C	14	USK
23	F	30	C	18	P
24	M	18	C	12	USK
25	F	23	C	18	P
26	F	26	C	16	SK
27	M	48	C	14	SK
28	M	59	C	18	P
29	M	39	C	22	P
30	M	28	C	17	SK
31	F	52	C	22	P
32	M	51	C	17	P
33	M	30	C	17	P
34	M	24	C	16	SK
35	F	25	C	18	P
36	F	26	C	18	P
37	M	30	C	16	SK
38	M	38	C	17	P
39	M	36	C	12	SK
40	M	16	C	11	SK
41	M	18	C	12	P
42	M	16	C	11	P
43	M	16	C	11	P
Mean		31.9		14.2	P 15
	F 13		2 AA		SK 10
	M 30		41 C		USK 18

EDUC = years of education, SES = socioeconomic status as rated with the Hollingshead scale (P = professional, SK = skilled worker, USK = unskilled worker), AA = African-American, C = Caucasian.

socioeconomic status, the control group consisted of 15 professionals, 10 skilled workers, and 18 unskilled workers.

To evaluate potential differences in mean age and mean years of education across the CHI and non-brain-injured groups, a one-way analysis of variance was performed. No significant difference was noted for age, $F(1, 72) = 0.009$, $p = .924$, or years of education, $F(1, 72) = 3.34$, $p = .072$, across the two groups.

Procedure

Each of the individuals with CHI and non-brain-injured controls was individually brought into a quiet room by the examiner. He introduced himself to each participant and stated that he was interested in learning more about conversational behaviour. Each participant was then engaged in a 15-minute conversation. The examiner and co-interactor in each of the conversations was a 42-year-old male with approximately 22 years of education working as a speech-language pathologist. The examiner was essentially a stranger to all of the individuals with CHI and non-brain-injured participants prior to the conversations. Most conversations were initiated by the examiner with the question ''Why are you here at the hospital/rehabilitation centre today?'' Each conversation was audiotaped and each recording transcribed verbatim with each utterance being assigned to one of the speakers (examiner or participant).

Analysis

The middle 6 minutes of each conversation were analysed for the purposes of this study. The segment of the conversation to be analysed was carefully selected so that it always began with the initiation of a new topic. Following procedures described by Blank and Franklin (1980), two categories of analyses were employed with each transcribed conversation: Appropriateness and Topic Initiation. Numbers of conversational turns were also tallied.

Turns. An utterance was defined as an oral statement or response. A participant's conversational turn could range from a single utterance to several utterances. A turn ended when the other participant assumed the role of Speaker and produced an utterance.

Appropriateness. Within the category of Appropriateness, each utterance was categorised either as a Speaker-Initiation or a Speaker-Response.

Speaker-Initiations were classified as Obliges or Comments. Obliges were utterances containing explicit requirements for a response from the listener (e.g., ''Where do you live?''). Comments were utterances not containing an explicit demand for a response (e.g., ''It's a nice place to work.''). The total numbers of Obliges and Comments produced by a subject or the examiner over the course of each conversation were tallied.

Speaker-Responses were classified in terms of adequacy. An Adequate response was one that appropriately met the initiator's verbalisation (e.g., in response to the question, ''What time is it''? the response might be ''It's three o'clock,''). An Adequate Plus response was relevant and elaborated the theme, providing more information than was requested (e.g., in response to the same question, ''It's three o'clock, I know that because I just passed the new clock at the Dime Savings Bank.''). An Inadequate response was one in which the information offered was invalid, irrelevant, or insufficient to meet the constraints established by the initiator's utterance (e.g., in response to the same question, ''I'm 37 years old.''). An Ambiguous response was one in which the information offered was unclear or ambiguous so that one could not determine whether it was adequate or not

(e.g., in response to the same question, ''Why should I tell you?''). Speaker-Responses could also follow Comments (e.g., in response to the Comment ''Boy it's really hot out there.'' an Adequate response might be ''It must be 95 degrees.''). The total numbers of Adequate Plus and Adequate responses produced by each participant in each conversation were tallied.

Topic initiation. Topics could be introduced by either a subject or the examiner. Topics could be changed in one of three ways: (a) at the beginning of the conversation, or by ending discussion of one topic and initiating another, referred to as a Novel Introduction (e.g., ''Terry told me you were from New Jersey. How long have you lived there?''); (b) by means of a Smooth Shift, in which discussion of one topic is subtly switched to another (e.g., the topic of discussion at this point in the conversation pertained to buying cars, one of the participants stated ''I really need a new car. I want to drive to Florida for my vacation.'' from that point on the topic shifted to a discussion of Florida); or (c) by means of a Disruptive Shift, in which discussion of one topic is abruptly or illogically switched to another topic (e.g., during a discussion of the Vietnam War, one participant stated ''I cut my hand on a fish hook yesterday.''). The total numbers of Novel Introductions and shifts (Smooth, Disruptive) produced by a participant and the examiner over the course of each conversation were tallied.

Reliability

Conversations were independently analysed by two of the three authors and 10% of the conversations were re-analysed by each author to assess intra-judge reliability. Point-to-point intra-judge reliability scores ranged from 80–99% (see Table 3). An additional 10% of the conversations were re-analysed to assess inter-judge reliability, scores here ranged from 80–97%. It should be noted that neither of the participant groups or the examiner produced many Inadequate or Ambiguous responses, nor were many disruptive shifts produced. Consequently, these three response or initiation types were not included in the data analyses.

RESULTS

Data analysed consisted of tallies of the number of Turns, Obliges, Comments, Adequate Plus, and Adequate responses, Novel Introductions, and Smooth Shifts. Two series of statistical analyses were performed on the conversational data from this study. First, data

TABLE 3
Intra- and inter-judge reliability scores for six analyses of conversational performance

Analyses	*Intra-judge*	*Inter-judge*
Turns	99%	99%
Appropriateness		
Obliges	99%	97%
Comments	93%	94%
Adequate	97%	91%
Adequate Plus	94%	93%
Topic Initiation		
Novel Topic	85%	82%
Smooth Shift	80%	80%

from the two participant groups (CHI and controls) were compared. Second, the examiner's conversational performances when interacting with the two participant groups were compared. Results of these analyses will be discussed separately. In an effort to control for the effects of the participants' varied socioeconomic backgrounds, all statistical analyses were performed with a covariate for years of education. Years of education was selected as the covariate because of the over-representation of poorly educated young males in the CHI population. Further, comparing the performance of individuals with TBI to inappropriate non-brain-injured controls (e.g., college graduates) may overestimate the cognitive-linguistic deficits associated with TBI (Snow et al., 1997; Yorkston, Zechers, Farrier, & Uomoto, 1993).

CHI versus non-brain-injured participants

To compare the performance of the CHI and non-brain-injured participant groups a multiple analysis of variance (with a covariate of years of education) was applied, which revealed a significant group effect for the remaining seven measures of conversational performance entered into the analysis (Turns, Obliges, Comments, Adequate Plus responses, Adequate responses, Novel Introductions, Smooth Shifts), $F(7, 67) = 4.15$, $p = .001$ (see Table 4). To identify which of these measures the CHI and control groups differed on, seven univariate tests were performed. An alpha level of .01 was adopted to control for type I errors.

Turns. Within each conversation, both the participant and the examiner functioned as an initiator and a responder. Turns, therefore, accounted for all utterances produced during a conversation. Number and length of Turns were related. A higher number of Turns was indicative of shorter (or fewer) utterances and fewer Turns of longer (or more) utterances. No significant difference was noted between the individuals with CHI and non-brain-injured groups for total number of turns per conversation, $F(1) = .98$, $p = .33$.

Appropriateness: Speaker-Initiations. *Obliges* were those initiations that contained the expectation that a response was to be forthcoming. Although the non-brain-injured participants, as a group, produced more Obliges in their conversations than did the

TABLE 4
Means and standard deviations (SD) of conversational analyses for the closed-head-injured (CHI) versus non-brain-injured (NOR) groups comparisons

	CHI		*NOR*	
Analyses	*Mean*	*SD*	*Mean*	*SD*
Appropriateness				
Turns	25.1	10.5	26.4	10.6
Obliges	3.6	4.2	6.8	10.9
Comments	20.9*	10.1	38.2*	16.9
Adequate responses	28.6	18.1	23.6	14.5
Adequate Plus responses	45.9*	17.7	31.8*	14.7
Topic Initiation				
Novel Introductions	0.5	1.6	1.0	2.5
Smooth Shifts	27.9	25.9	29.3	27.1

* Significant at $p < .01$

individuals with CHI, no significant differences across the groups were noted $F(1) = 2.35$, $p = 1.30$.

Comments were utterances for which no response was explicitly demanded. The non-brain-injured participants produced nearly twice as many Comments during their conversations with the examiner than did the individuals with CHI, and this difference was noted to be significant, $F(1) = 21.03$, $p < .001$.

Appropriateness: Speaker-Responses. Adequate responses were those that provided the information requested and nothing more. There was no significant difference noted between the control and CHI groups for this response category, $F(1) = 1.02$, $p = .315$. Adequate Plus responses were those that provided the information requested as well as additional information. A significant difference was noted between groups for this response type, $F(1) = 11.35$, $p = .001$, with the individuals with CHI producing more Adequate Plus responses per conversation than the non-brain-injured controls.

Topic Initiation. No significant group differences were noted for the measures of Topic Initiation. That is, the individuals with CHI and non-brain-injured controls produced comparable numbers of Novel Introductions, $F(1) = 3.80$, $p = .81$, and Smooth Shifts, $F(1) = 0.01$, $p = .95$, during their conversations with the examiner.

Examiner with CHI versus non-brain-injured participants

To compare the examiner's performance during conversations with the individuals with CHI and non-brain-injured participants, a second multiple analysis of variance (with a covariate of years of education) was applied indicating a significant group effect for the seven measures of conversational performance (Turns, Obliges, Comments, Adequate Plus responses, Adequate responses, Novel Introductions, Smooth Shifts), $F(1, 67) = 3.97$, $p = .001$ (see Table 5). Seven univariate follow-up tests were performed to identify which measures the examiner differed on. An alpha level of .01 was used to control for type I errors.

TABLE 5
Means and standard deviations (SD) of conversational measures for the examiner with the closed-head-injured (CHI) versus the examiner with the non-brain-injured (NOR) groups comparisons

	Exam. with CHI		*Exam. with NOR*	
Analyses	*Mean*	*SD*	*Mean*	*SD*
Appropriateness				
Turns	25.2	10.7	26.5	9.6
Obliges	77.1*	11.2	57.0*	19.5
Comments	22.1*	10.6	37.5*	16.9
Adequate responses	2.5	3.5	4.4	7.2
Adequate Plus responses	0.5	1.6	2.5	5.1
Topic Initiation				
Novel Introductions	8.3	8.1	6.7	5.9
Smooth Shifts	49.1*	13.0	40.5*	13.9

* Significant at $p < .01$

Turns. No significant difference was noted for total number of turns per conversation for the examiner in conversations with the individuals with CHI versus the non-brain-injured control groups, $F(1) = 1.51$, $p = .22$.

Appropriateness: Speaker-Initiations. The examiner produced more *Obliges* in conversations with the individuals with CHI than in those with the non-brain-injured controls. This difference was noted to be significant, $F(1) = 27.20$, $p < .001$.

The examiner also produced significantly more *Comments* in conversations with the non-brain-injured controls than in those with the individuals with CHI, $F(1) = 20.59$, $p < .001$.

Appropriateness: Speaker-Responses. No significant differences were noted for either Adequate, $F(1) = 1.97$, $p = .16$, or Adequate Plus, $F(1) = 3.59$, $p = .06$, response production by the examiner in conversations with the two participant groups.

Topic initiation. Although the examiner produced comparable numbers of Novel Introductions in the conversations with the two participant groups, $F(1) = 0.98$, $p = .32$, significant differences were noted for Smooth Shifts, $F(1) = 7.45$, $p < .01$. The examiner utilised more Smooth Shifts in the conversations with the individuals with CHI than in those with the non-brain-injured controls.

Summary

In summary, the individuals with CHI and the non-brain-injured control groups could be distinguished on the basis of two measures of conversational performance: number of Comments and Adequate Plus responses. The non-brain-injured controls produced more Comments than the individuals with CHI, and the individuals with CHI produced more Adequate Plus responses then the non-brain-injured controls. When the conversational performance of the examiner was compared when interacting with the two participant groups, differences were noted on three measures: numbers of Obliges, Comments, and Smooth Shifts. The examiner produced more Obliges and Smooth Shifts in the conversations with the individuals with CHI and produced more Comments in conversations with the non-brain-injured controls.

DISCUSSION

The findings of this study have several implications pertaining to the characterisation of conversational performance following CHI and the use of Blank and Franklin's (1980) procedure for analysing conversation. As a point of clarification, throughout the following discussion the terms TBI and CHI will both be used. In the present study as well as in the Coelho et al. (1993) investigation, the individuals with TBI who were studied all had closed head injuries (CHI) which is a subset of TBI. In other studies when the exact nature of the TBI has not been specified (i.e., CHI versus penetrating head injury) the generic term TBI will be used. It is our intent to be as specific as possible in an effort to facilitate the generalisation of these findings to the appropriate sub-populations of individuals with TBI.

CHI versus non-brain-injured participants

With regard to conversational skills of individuals with CHI, Coelho et al. (1993) noted that the five individuals with CHI they studied had more turns per conversation than the five non-brain-injured controls and also produced shorter utterances per turn. They concluded that the CHI subjects had more difficulty initiating and sustaining

conversations than the controls, as indicated by their lower numbers of Adequate Plus responses and Topic Initiations. Similar findings were reported by Bond and Godfrey (1997) who noted that individuals with TBI prompted less frequently during conversations with an examiner than did non-brain-injured controls. According to social skills theory, prompts are used to find areas of common interest, to create opportunities for the other person to talk about themself, to continue a conversation that has reached a natural pause, and to show concern or interest for the other person. The conversations of the individuals with TBI were therefore rated as being less rewarding, interesting, and appropriate, as well as more effortful.

The results of the present study, with a few exceptions, are consistent with those of the previous investigations. Although earlier descriptions of conversations with individuals with TBI and non-brain-injured controls reported a greater number of turns, and turns of shorter duration for the individuals with TBI, this was not the case in the present study. The conversations of the individuals with CHI consisted of a comparable number of Turns and Turn duration as those of the non-brain-injured controls. What was different about the conversations of the individuals with CHI was the overall natural flow of the interaction. As was noted in previous studies, the individuals with CHI were dependent on the examiner to maintain the momentum of the interaction. This was evident in the Speaker-Initiation data, specifically Oblige and Comment production. As a group the individuals with CHI did not initiate a great deal. They produced fewer spontaneous Obliges and Comments than did the non-brain-injured controls and appeared to function primarily as ''responders''. Further, post-hoc assessment indicated that when they did respond, many of their responses were classified as Adequate Plus, that is, they provided more information than was requested. Although this extra information was not inappropriate or bizarre, it did not facilitate disclosure on the part of the conversational partner (i.e., the examiner). The function of disclosure in social interaction is to allow the opportunity to talk about oneself or subjects of interest to oneself, in order to establish, sustain and enjoy social interaction (Bond & Godfrey, 1997). For example, in response to the examiner's Oblige ''Did you do anything fun over the weekend?'' a CHI subject responded ''Fun? No. Washed my car. I really would like a new car. Mine is beat. I'm older now, I feel I should have a car with authority. A car tells a lot about a person. Whether you care how you present yourself. It's important, can open doors.'' These findings are consistent with the observation of Marsh and Knight (1991) that the individuals with TBI they studied, in conversations with a stranger, were more passive and failed to attend to or show interest in the other person.

As previously noted, the present findings are concordant with previous investigations of conversational skills of individuals with TBI. However, two related issues may also have accounted, at least in part, for the present findings. The first pertains to what has been termed the ''tenor'' of these conversations. Tenor is one aspect of context as described by Halliday (1994). Tenor refers to who is taking part in the interaction, to the nature of the participants, their status, and roles (e.g., in the present study, the tenor was unfamiliar participants, unequal status, examiner-superordinate [information seeker], participant-subordinate [information provider] (Togher et al., 1999). The tenor of the conversational interactions studied in this investigation may have constrained the individuals with CHI and therefore their apparent functioning as ''responders'' may not have been totally the result of their brain injuries.

The second issue is related to how the conversations were recorded and subsequently transcribed. All recordings of the conversational interactions from this study were audio-recorded and consequently only verbal information was transcribed. For example, a

variety of conversational gestures have been described which express elocutionary intent of spoken utterances as well as marking discourse structure (see Kendon, 1995). It is entirely possible that a great deal of non-verbal information was not captured, which when added to the analyses may have further contributed to the characterisation of the CHI participants' communicative proficiency.

Examiner with CHI versus with non-brain-injured participants

The performance of the examiner in the conversations with the individuals with CHI may have been compensatory in nature. As a result of the CHI participants' lack of initiation and contribution to the conversational flow, the examiner produced more Obliges and introduced more Topic Initiations through Smooth Shifts, which appeared to maintain the CHI participants' role as ''responders''. The examiner's performance in conversations with the non-brain-injured controls appeared quite different. The examiner did not seem to carry the bulk of the communicative burden or responsibility for keeping the conversation moving. Rather in conversations with the non-brain-injured controls this was a shared responsibility. This is suggested by the greater number of Comments produced by the controls versus the individuals with CHI, and the greater number of Comments produced by the examiner in the conversations with the non-brain-injured participants. The conversations between the controls and the examiner were characterised by a more natural give-and-take flow. There appeared more interest on the part of the non-brain-injured controls to get to know the examiner (i.e., for disclosure), or at least the controls appeared more adept at facilitating that process. However as stated earlier, these findings should not be over-interpreted. Although the examiner was a stranger to each of the participants in the study, the power differential of the roles between ''patient'' and ''professional'' may have been much greater than between ''hospital employee'' and ''professional''. In addition, it is unclear to what extent the examiner structured the interaction (even subconsciously) when paired with the CHI participants. Consequently, the individuals with CHI may not have been dependent, but rather, the examiner may have dominated the interaction and inhibited greater participation on the part of the individuals with CHI (E. Armstrong, personal communication, 9 September 2001).

Blank and Franklin's analysis procedure

Finally regarding Blank and Franklin's (1980) analysis for conversation, this procedure did delineate differences between the participant groups and in the examiner's performance when interacting with these individuals. However, there were aspects of the procedure that were noted to be problematic. For example, the indentification of Smooth Shifts was frequently a difficult decision to make. Smooth Shifts were those instances in which the topic of conversation was subtly shifted to another topic. The basis of the decision was often subjective and consequently yielded the lowest intra- and inter-judge reliability scores. In addition, Adequate Plus responses need to be interpreted with caution. As was apparent in the results of the present study, providing more information than was requested should not always be considered desirable or appropriate. With these caveats in mind, the overall procedure was useful for describing the communicative dyads, and warrants continued study.

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APPENDIX

Hollingshead rating procedure

Socioeconomic status (SES) was determined using the Hollingshead Four Factor Index of Social Status (Hollingshead, 1972). Briefly, this index considers occupation and years of education to determine a person's position within a community. Initially, Hollingshead delineated five distinct class groups on the basis of ranges of scores determined by factors of employment and education weighted by a standard regression equation. Group V indicates the lowest socioeconomic status and I the highest. In the present study, three groups were formed from five possible Hollingshead ratings: group 1, professionals, included subjects with Hollingshead ratings of I and II; group 2, skilled workers, included subjects with Hollingshead ratings of III; and group 3, unskilled workers, included subjects with ratings of IV and V. The five ratings were collapsed into three groups because many of the distinctions between Hollingshead ratings I and II and IV and V were subtle, and it would have been extremely difficult to find adequate numbers of subjects at each rating level. For the younger subjects who were not yet in an occupation, the Hollingshead rating was based on the household they were living in at the time of their injury, that is, the rating reflected level of education and occupation of their parents.