

Appraisal of Communicative Competence
in Head Injured Adults

Sandra B. Milton

Casa Colina Hospital for Rehabilitative Medicine, Pomona, California

Carol A. Prutting and Glenn M. Binder

University of California, Santa Barbara, California

Most people agree that individuals who suffer a head injury have communication problems. However, traditional assessment tools do not always identify how communication breaks down. In contrast to Holland's (1977) observation that aphasic patients communicate better than they talk, the reverse seems true for head injured individuals. This population appears to talk better than they communicate. Furthermore, recent literature describing communicative behavior in the head injured (Holland, 1982a; Milton, Tunstall, and Wertz, 1983; Hagen, 1984; Bernstein-Ellis, 1984) suggests that communication may be disrupted in this population in ways which are qualitatively different from the stroke patient we label "aphasic." A specific linguistic disorder, revealed by traditional test scores, may or may not be present in head injured individuals. Yet, this same population often exhibits significant communicative difficulties in daily living situations.

Some clinicians wear pragmatic shades. As noted by Wilcox (1983), pragmatics -- how language is used in interpersonal situations -- has come to be regarded by speech and language pathologists as an important dimension of appraising communication and identifying treatment goals. However, one significant thing about pragmatics is that those who seem to know what it is do not agree on a descriptive framework. One perspective is to view pragmatics within a tripartite division along with syntax and semantics (Bloom and Lahey, 1978). Other investigators use the term to represent an overall framework from which to study aspects of communicative behavior across various communicative levels (Bates, 1979). This includes, but is not limited to, examination of syntax, semantics, and phonology. Regardless of one's theoretical orientation, it is clear that researchers studying adults with neurogenic language disorders are beginning to consider the area of pragmatics (Holland, 1982b; Penn, 1983; Foldi, Cicone, and Gardner, 1983; Binder, 1984; Gauvin, working paper).

We use the term "pragmatics" in the broader sense to refer to behaviors which have the potential, if used inappropriately, to disrupt or penalize conversational interchanges. The pragmatic focus, which transcends comprehension and production of isolated words and grammatical structures, becomes useful when we examine the communicative behavior found in the head injured population, especially during the later phases of recovery.

Consider the following description, taken from a case history, of a 26-year-old head injured individual's conversational style at 16 months post-injury:

1. Tendency to include non-specific, vague, and inappropriate words or phrases;
2. Periodic lengthy verbalizations which digress from the main topic and include irrelevant or tangential information; and
3. Abrupt topic switches.

This individual has significant problems using language in socially appropriate and effective ways. Informal evaluation of conversational style

indicated the presence of communication problems. However, these problems were not identified in standardized testing. This patient scored above the aphasia cut-off score on the Western Aphasia Battery (WAB) and approached normal performance on the Communicative Abilities of Daily Living (CADL). Although the CADL does assess a variety of communicative acts, it was not designed specifically to examine conversational interactions in a natural setting.

One popular explanation for the existence of communication problems in the absence of a significant structural language disorder is as follows. Cognitive abilities are inextricably involved in successful management of a conversation, and cognitive impairments -- problems with attention, inhibition, memory, integration and organization of information, etc. -- often persist following traumatic brain injury (Hagen, Malkmus, and Burditt, 1979; Levin, Grossman, Rose, and Teasdale, 1979; Hagen, 1981, 1984; Holland, 1982a; Milton, 1983a, 1983b). Cognitive deficits may have a negative influence upon the way a head injured individual uses language in a social situation. Inappropriate management of communicative exchanges by a head injured individual and the penalization which follows often present a major barrier to social reintegration. For example, a normal conversational partner may abruptly walk away from a communicative exchange involving a head injured individual or react with a stinging comment such as, "What in the world are you talking about?" More subtle tactics may also be employed. For example, the conversational partner may tune out what is being said or purposely avoid interactions with this head injured individual. From a social perspective, when any of these responses by a conversational partner occur, they suggest the presence of a communicative disorder. Therefore, communication-based intervention may be warranted for the head injured population, even when specific linguistic deficits are not apparent.

A social or societal criteria for determining how effectively an individual communicates is not a contemporary notion. Prutting (1982), in an article entitled "Pragmatics as Social Competence," reminds us that as early as 1939, a communicative disorder was defined by Van Riper at the dyadic, interactional level. According to Van Riper, a speech disorder was one which called attention to itself, interfered with communication, or caused a person to be maladjusted. Today, almost 50 years later, adherence by speech and language pathologists to a social perspective has gained increased momentum. Clinicians are now concerned with identifying and effecting changes in communicative behaviors that make socially relevant differences in a client's life (Holland, 1977; Wolf, 1978; Prutting, 1982; Muma, 1983; Tonkovich and Peach, 1983; Binder, 1984; Simon, 1984).

To our knowledge, there has been no previous research addressing the pragmatic behaviors of head injured individuals during unstructured conversational interactions. Such information about communicative competence may serve as a backdrop to interpret diagnostic data obtained from traditional language and pragmatic tests and assist us in focusing treatment. The purposes of this study were: (1) To compare the range of pragmatic deficits exhibited in conversational interactions by head injured individuals with performance of normal adults. (2) To identify the characteristics of pragmatic deficits that exist in a sample of head injured patients.

Subjects. Subjects were five head injured adults and five normal adults matched for age, sex, and educational levels. Age for the experimental group was defined as age at onset of head injury. The mean age was 19.2 years (range from 17 to 24 years). Age for the control group was defined as age at time of evaluation. The mean age for the control group was 19.4 years

(range 18 to 21 years). Mean education in years for the head injured group was 11.6 years compared to a mean of 11.0 years for the control group.

Four members of the head injured group were enrolled in a residential transitional living center program designed to improve independent living skills and social and community reintegration. One head injured subject was being seen in a traditional, one-on-one outpatient setting. As shown in Table 1, mean time post-injury at time of evaluation was 34 months, with a range of 6 to 112 months. Mean length of coma for the head injured group was 10.2 weeks. All subjects in the experimental group suffered acceleration-deceleration injury. That is, trauma to the head resulted from either the impact of a moving head upon a stationary or slower moving object (as in subject 1's downhill skiing accident) or from the impact of a moving object upon a slower moving head (as in subject 3's bike collision with a car) (Gurdjian, 1971). Diffuse, bilateral brain damage is believed to be associated with acceleration-deceleration injuries (Adams, Mitchell, Graham, and Doyle, 1977; Strich, 1956, 1970). This localization information may or may not be shown on neuroradiological testing. Apraxia and dysarthria were not present in any head injured subject included in our study.

Table 1. Descriptive information for the head injured group.

Subject	Months Postonset at Evaluation	Length of Coma	Nature of Accident
1	15 Months	5 Weeks	Downhill Skiing
2	10 Months	3 Weeks	Motorcycle vs. Automobile
3	112 Months	20 Weeks	Bicycle vs. Automobile
4	27 Months	20 Weeks	Automobile vs. Automobile
5	6 Months	3 Weeks	Motorcycle vs. Automobile
	Range: 6-112	Range: 3-20	
	Mean: 34	Mean: 10.2	

Procedures. The oral language portion of the WAB was administered to evaluate language severity in the head injured group. Mean aphasia quotient for this group was 96.7 with a range from 94.0 to 99.4. No subjects scored below the 93.8 aphasia cut-off score. Two measures were employed to evaluate a broad sampling of communicative competence in everyday situations: 1) The CADL was administered to the head injured group; and 2) ratings from the Pragmatic Protocol (Prutting and Kirchner, 1983) were obtained for both groups.

The Pragmatic Protocol provides assessment of 32 pragmatic behaviors of school-age children and adults using the speech act theoretical framework (Austin, 1962; Searle, 1969). The 32 behaviors cut across all levels of the communicative system (phonology, syntax, semantics, and pragmatics) to provide an overall communicative index to be interpreted with in-depth measures. This tool was designed to be sensitive to the interactional aspects of the communicative situation and to enhance a clinician's understanding of how an individual uses language (Prutting and Kirchner, 1983). A copy of the Pragmatic Protocol is found in Appendix A. For definitions of the behaviors in the protocol, see Prutting and Kirchner, 1983. The Pragmatic

Protocol organizes behavior under three speech act categories. First, there is the utterance act. This includes verbal, nonverbal, and paralinguistic ways in which a message is presented. The 13 behaviors listed here may be considered the packaging of the communicative act. The second category is the propositional act. This category consists of behaviors which provide the linguistic meaning of the sentence. The last 15 items, which appear under the illocutionary and perlocutionary acts, constitute the reciprocal behaviors that regulate discourse between speakers and listeners. The illocutionary act represents the speaker's intentions, while the perlocutionary act represents the effects of the speaker's action on the listener. For our study, two changes were made in the structure of the Pragmatic Protocol.

- (1) The item "stylistic variation" was deleted under propositional act.
- (2) The behavior "affect" was added under the utterance act. We define "affect" as the presence an individual leaves behind, for example, immaturity.

The Pragmatic Protocol was employed while observing individuals engaged in 15 minutes of videotaped spontaneous conversation during unstructured communicative interactions. Our subjects conversed with a familiar partner, namely, the speech and language pathologist. Conversational topics were not specified. Rather, a range of topic suggestions were provided prior to the conversational taping. These included talking about friends, family, hobbies, and travel and work experiences.

Each of the behaviors listed on the Protocol was judged by the principal investigator as appropriate or inappropriate. The following guidelines were used for scoring on the Protocol.

Appropriate: Behaviors which facilitate the communicative interaction or are neutral.

Inappropriate: Behaviors which detract from the communicative exchange and penalize the individual.

Thus, similar to the PICA scale (Porch, 1967), behaviors were not judged by "rightness" or "wrongness."

When using the Pragmatic Protocol two issues should be considered -- frequency and severity. The number of times a behavior is marked inappropriate is not taken into consideration. The rationale is that if a behavior is once used inappropriately that is reason enough to consider the behavior as a potential target for remediation. The second point which is important to note is that the Protocol does not yield a severity index. It is likely that some behaviors are more penalizing than others. Furthermore, certain clusters of pragmatic deficits may be more penalizing than other combinations. It is possible to calculate percentages of appropriate and inappropriate behaviors for accountability purposes. However, it is important that this percentage is not interpreted as a reflection of the severity of the deficit.

Reliability. The investigator and the reliability observer were trained to employ the Pragmatic Protocol by its author. Training procedures included familiarization, discussion, and clarification of the definitions of each of the pragmatic behaviors being evaluated. Next, interobserver reliability was obtained on speech samples of all subjects participating in the study. During the reliability session, each videotaped conversational interaction was observed and a Pragmatic Protocol was completed independently for each subject by both the investigator and reliability observer. Point-by-point reliability was calculated separately for the categories "appropriate" and "inappropriate." Interjudge reliability ranged between 92 and 100 percent. High inter- and intrajudge reliability has also been reported for this assessment procedure when employed with normal children, children with articulation

disorders, children with language disorders (Prutting, Kirchner, Hassan, and Buen, 1983) as well as with adults who suffered right and left CVAs (Binder, 1984; Gauvin, working paper).

Results. The head injured group received a mean performance of 128.8 on the CADL with a range from 118 to 135. This mean score is just above the cut-off score (128) for normal functional communication in Holland's standardization sample. Error responses tended to cluster around test items requiring: (a) orientation explanations -- for example, "Would you give me some directions from your home to the doctor's office?"; (b) visual attention and utilization of contextual cues -- for example, a picture showing a person smoking in a room where the sign says no smoking; (c) mathematical calculations and problem-solving -- for example, "The doctor wants to see you again in about two weeks. What day do you want to come in?"; and (d) divergent abstract reasoning -- for example, "Show me the drawing that goes with the saying: 'They shot the bull.'"

Data obtained using the Pragmatic Protocol were subjected to descriptive analyses. The mean percent appropriate pragmatic behaviors were computed separately for each group. Group data for the head injured patients indicate that 76 percent of behaviors examined were judged appropriate. Every patient in the head injured group exhibited some inappropriate behaviors, ranging from 18.8 to 31 percent. Table 2 presents the number of inappropriate pragmatic behaviors of individual subjects within the head injured group. Number of inappropriate pragmatic behaviors ranged from six to ten with a mean of 7.6 behaviors. In contrast, a high occurrence of appropriate pragmatic behaviors was found in the normal group. The range of appropriate behaviors for the normal group was 98.7 to 100 percent with a mean of 99.4 percent. Three subjects in the normal group exhibited 0 inappropriate pragmatic behaviors. Of the remaining two subjects, one subject showed inappropriate fluency -- that is, he was judged as speaking too rapidly, and one subject was marked down for topic introduction. This subject would wait for his partner to introduce conversational topics. Because the normal group was appropriate in almost all pragmatic behaviors, further pragmatic analysis was confined to the head injured group.

Table 2. Number of inappropriate behaviors for each of five head injured subjects.

Subject	# Inapp. Behaviors.
1	6
2	8
3	10
4	7
5	7

Qualitative aspects of the data for each head injured individual were examined. The pattern of distribution of percentage inappropriate pragmatic behaviors for each speech act category was obtained. The highest proportion of inappropriate pragmatic behaviors exhibited by head injured adults was the illocutionary/perlocutionary act (42.0%). The second highest percentage of inappropriate pragmatic behaviors was found in the propositional act

category (33.3%). The smallest proportion of behaviors judged inappropriate occurred in the utterance act (21.4%). These findings suggest that breakdown occurs most frequently in the way head injured adults function as discourse partners.

Table 3 displays in rank order the ten behaviors most frequently judged inappropriate for the head injured patients. All demonstrated difficulty with prosody; four of the five showed problems with affect, particularly the presence of excessive giggling; three of the five subjects were rated inappropriate for (a) topic selection (e.g., demonstrated a restricted range of topics to talk about); (b) topic maintenance (e.g., changed topics following minimal speaking turns); (c) turn-taking initiation; (d) turn-taking pause time; (e) turn-taking contingency (e.g., awkward phrasing of new information added to the ongoing exchange); and (f) quantity/conciseness (e.g., included redundant information or over-detailed content). Two of the five subjects were marked down for fluency (e.g., excessive use of filler phrases or press of speech within a speech act); and for intelligibility (e.g., variable clarity throughout the conversation).

Table 3. Rank Order of top 10 inappropriate pragmatic behaviors for adults with head injuries.

Rank	Pragmatic Behavior	N	Incidence
1	Prosody	5/5	100%
2	Affect	4/5	80%
3	Topic Selection	3/5	60%
	Topic Maintenance		
	Turn-taking Initiation		
	Turn-taking Pause Time		
	Turn-taking Contingency		
	Quantity/Conciseness		
4	Intelligibility	2/5	40%
	Fluency		

DISCUSSION

The head injured subjects behaved either normally or near normal on the two traditional standardized tests. All subjects scored above the aphasia cutoff on the WAB and approached the normal cutoff on the CADL. However, the head injured subjects differed from the normal group on the Pragmatic Protocol, which permits appraisal of a range of behaviors present in normal discourse. Our results suggest the value of assessing a wider range of communicative behaviors in head injured adults than are examined traditionally. The Pragmatic Protocol appeared useful in identifying strengths and weaknesses of conversational competence in head injured adults. Moreover, it provided possible areas to focus treatment.

Once the Pragmatic Protocol is used for screening purposes the clinician may go back and perform a more in-depth account of the topography of various

behaviors. For instance, when such behaviors as specificity and accuracy, contingency, and given and new information are utilized inappropriately, one may want to perform a detailed analysis of cohesion (Halliday and Hasan, 1976). Currently, Mentis (working paper) and Holland (1984) are in the process of studying cohesion strategies in head trauma patients. It is this subtle interplay between molar assessment (identification) and molecular approaches (description) that provide direction for enhancing communicative competence.

APPENDIX A

PRAGMATIC PROTOCOL

Name: _____ Date: _____

Communicative Setting Observed: _____ Communicative Partner's Relationship: _____

Communicative Act	Appropriate	Inappropriate	No opportunity to observe
UTTERANCE ACT			
A. Verbal/Paralinguistic			
1. Intelligibility			
2. Vocal intensity			
3. Voice quality			
4. Prosody			
5. Fluency			
B. Nonverbal			
1. Physical proximity			
2. Physical contacts			
3. Body posture			
4. Foot/leg movements			
5. Hand/arm movements			
6. Gestures			
7. Facial expression			
8. Eye gaze			
PROPOSITIONAL ACT			
A. Lexical selection/use			
1. Specificity/accuracy			

Communicative Act	Appropriate	Inappropriate	No opportunity to observe
B. Specifying relationships between words <ol style="list-style-type: none"> 1. Word order 2. Given and new information C. Stylistic variations <ol style="list-style-type: none"> 1. The varying of communicative style 			
ILLOCUTIONARY ACTS AND PERLOCUTIONARY			
A. Speech acts <ol style="list-style-type: none"> 1. Speech act pair analysis 2. Variety of speech acts B. Topic <ol style="list-style-type: none"> 1. Selection 2. Introduction 3. Maintenance 4. Change C. Turn-taking <ol style="list-style-type: none"> 1. Initiation 2. Response 3. Repair/revision 4. Pause time 5. Interruption/overlap 6. Feedback to speaker 7. Adjacency 8. Contingency 9. Quantity/conciseness 			

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DISCUSSION

- Q: I like the Pragmatic Protocol very much and I'm happy to see it used with head trauma patients. I have one question. Do you think the propositional aspect of the Pragmatic Protocol sufficiently takes care of evaluating syntax and semantics or were additional clinical findings in these areas revealed on the WAB spontaneous language sampling section?
- A: Our subjects' linguistic problems were, for the most part, not captured on the WAB spontaneous language sampling. Scores here ranged from 18/20 to 20/20. On the other hand, the Pragmatic Protocol assisted in identifying the presence of semantic or syntactic difficulties, as indicated by a checkmark under the "inappropriate" column. As mentioned in the paper, the Pragmatic Protocol was designed to function as a screening tool and that is all. When problem areas are identified, additional in-depth measures are then employed to describe in more detail what is wrong. Halliday and Hasan's cohesion analysis is one example of a more in-depth measure to employ. The descriptive scoring system for naming which I reported on last year would be a second example of a follow-up detailed analysis to carry out.
- Q: What were the prosodic abnormalities in your head injured patients?
- A: The abnormalities were primarily inappropriate stress patterns within a word or across a sentence.
- C: I was excited to see a normative sample in your study. I feel it's important that you're attempting to put together a reference group. My comment is actually an encouragement to make your normative sample larger and to very discreetly use this reference group as a frame of reference. In the literature, there's a lot of concentration in discriminating between types of people with brain damage without first talking about the degree of distinction from a normal population.