

Scale for Assessment of Conversation Impairment in Individuals with Traumatic Brain Injury

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Abstract

Impairment in conversation is one of the persisting, subtle and sub clinical feature reported in TBI individuals even after months of recovery from the medical ailments. The study attempted to describe the propositional and non propositional aspects of conversational speech in TBI individuals in the discourse mode of conversation and compared the same with that of normal control subjects. Eight adult TBI individuals and age, gender and education matched normal subjects were taken for the study. The TBI individuals with a minimum of 6 months after the accident and with no aphasia (as per the testing) were included. Conversation on various topics was recorded and transcribed. A severity rating scale was developed to rate the conversation impairment in discourse in these individuals. Results show that there is impairment in various aspects of discourse in TBI individuals as compared to normal subjects.

Introduction

Traumatic brain injury (TBI) has been defined as “an insult to the brain, not of the degenerative or congenital nature but caused by an external force, that may produce a diminished or altered state of consciousness” (National Head Injury Foundation, 1985). Brain injuries arising from head trauma are generally classified into two broad types: non penetrating (closed) injuries and penetrating (open) brain injuries. Closed head injuries tend to be associated with diffuse brain pathology and in contrast, penetrating head trauma tends to lead to more focal brain pathology, although diffuse effects also can be observed. The closed head injury patients show more evident speech and language communication disorders and are usually referred to speech language pathologists. These CHI patients mainly exhibit cognitive linguistic and pragmatic difficulties. Sohlberg & Mateer (1989) noted that pragmatic deficits might be the most pervasive communication problems in adults with TBI. Performance on pragmatic rating scales and analysis of response appropriateness and topic management revealed that TBI individuals experienced difficulty when called upon to function as a discourse partner, whether in conversation or referential communication (i.e. structural exchange on a specific topic requiring extensive listeners’ feedback).

The language in TBI individuals may be phonologically, syntactically and semantically intact yet lack meaning because of irrelevant, confabulatory, circumlocutory or tangential responses in relation to a specific topic, sequencing and thoughts. These factors lead to impairment in their conversational discourse. Haynes & Haak (2002) studied discourse in referential communication and conversational task in 10 college students with closed head injury. They found that most of them had significantly higher percentage of conversational discourse errors. In various other studies (Allen & Brown, 1976; Milton,

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1984; Mentis & Prutting, 1991), TBI patients were found to be lacking in many areas of conversation discourse like propositional and nonpropositional aspects of conversation.

Need for the study

Over the years many scales are developed to tap the pragmatic deficits in neurogenic communication disorders. But very few are developed exclusively for traumatic brain injured population and none of the tests are able to give a comprehensive picture of all the affected parameters in conversation. These scales do not include all the parameters of conversation and do not deliberate upon variability if any in terms of hemispheric involvement. Left hemisphere damaged individuals exhibit different conversational impairment compared to Right hemisphere damaged individuals. Hence an attempt is made to profile all the affected conversation parameters in non-aphasic individuals with various types of lesions in TBI and to develop a scale to aid or a screening tool for assessing impairment in conversation of TBI adults.

Aim of the study:

3. To collate and compare discourse parameters in the speech of TBI individuals and matched normal subjects.
4. To propose a severity rating scale for assessment of discourse impairments in individuals with TBI based on the observed deviant parameters in the speech of individuals with TBI in the study.

Method

Subjects

Experimental group comprised of six male and two female adults with traumatic brain injury. Eight normal adults matched for age, gender and education were selected as control group. The experimental group was divided into three subgroups depending on the loci of brain insult viz. left hemisphere damage, right hemisphere damage and bilateral damage. Subjects with confirmed lesions in the brain based on the neurological evaluation without any history of amnesia with at least 6 months post accident were selected. All the subjects included in the study did not have aphasia as confirmed by Western Aphasia Battery test (Kertesz, 1979). Subjects who were identified as having moderate to severe injury on the basis of Glasgow Coma Scale (Jennette & Teasdale, 1975) were selected for the study. Control group comprised of normal individuals with no history of traumatic brain injury or any other brain insult. They were also screened for any speech, language, cognitive-linguistic and hearing impairment. They were matched for age and sex of the subjects in the experimental group.

The target task included free conversation between the subjects and investigator. The conversation was carried out between the investigator and the subjects on various topics. A total of three sessions of conversation each varying from 30 to 40 minutes was carried out. The conversation was recorded on a magnetic tape recorder (Philips RR 212). All the recordings were carried out in a quiet room with no distraction in between the recordings. Before recording the subjects were instructed to talk in a way similar to two friends talking to each other. The recorded audio samples were transcribed for analysis of errors in discourse.

Using different sources of literature and available scales for measurement of discourse impairment the conversation sample was analyzed for two aspects. Each of these was further divided into different features.

5. Propositional aspect of conversation.
6. Non-propositional aspect of conversation.

Scoring: Raw scores were calculated by counting the frequency of occurrence and t test was applied for parameters like topic management, turn taking, and conversational repair to obtain the significant difference. A five point perceptual rating scale was used to score four of the parameters, which included the following:

- Information content
- Information adequacy
- Coherence and
- Communication intent

A contingency value was calculated for these parameters to compare the performance of experimental and control groups

Results and Discussion

The frequency of occurrence of the behavior was calculated for most of the features. The results are interpreted using suitable statistical procedures wherever possible. Following parameters were analyzed:

A. Propositional aspects of conversation: The following discourse parameters were analyzed from the conversation:

- ❖ **Topic management:** A frequency count of each of the parameter in a 20 minutes sample was done and t test was applied to check for significant difference between TBI group and normals. There was no significant difference between the TBI and the normal group for the features [a] Relevancy of topic, [b] Non coherent topic changes, [c] Perseveration, [d] Responses which elaborate the topic. Other parameters such as [a] Introduction of topic, [b] Inappropriate topic changes, [c] Rapid topic shift, [d] Minimal responses, [e] Extra elaboration of topic and [f] Minimal elaboration did not show any significant difference.

The reason for poor introduction of topics by the experimental group could be because of the semi-structured nature of conversation elicited in the experimental design. In spite of two to three familiarity sessions held with the investigator, the subjects might have felt that introduction of topics during conversation was more a responsibility of the investigator because of which it is probable that they did not introduce more topics. Other parameters did not show any significant difference because there was increased variability in the parameters exhibited by TBI group.

- ❖ A five point rating scale was used to rate the information content of the experimental subjects in conversation sample of 20 minutes as in Table 1.

Table 1: Rating scale for information content, information adequacy and coherence.

4	Present always
3	Present most of the times
2	Present sometimes only
1	Present rarely
0	Never present.

Here all the normal subjects got the ratings of 4 and TBI individuals got ratings of 4, 3 and 2. Contingency value was calculated for this and this showed that there was no association for the “information content” between the two groups suggesting that information content is not meaningful and coherent in TBI individuals. This was reasoned to be due to the presence of excessive redundancies, disfluencies and parenthetical remarks in the TBI individuals.

- ❖ **Information adequacy:** A five point rating scale was utilized to rate for information adequacy in the conversation samples of experimental and control subjects. There was no association observed between the two groups in terms of information adequacy. Information adequacy was 100% for all the normal subjects and it was less in TBI subjects. TBI individuals demonstrated poor information adequacy.
- ❖ **Coherence:** Coherence was analyzed for two features: local coherence and global coherence. A rating scale of 5 was utilized (As shown in table) to rate the experimental subjects for given features of local and global coherence. It is observed that both local and global coherence are affected in TBI subjects as compared to normals and from the total percentage it is seen that global coherence is affected more than the local coherence. This is in support with the study by Hough & Barrow (2003) who indicated that global coherence is affected more than local coherence in TBI subjects.
- ❖ **Communication intent:** The communication intent in terms of presence or absence of the features in the speech of TBI subjects was compared with that of the normal subjects. Contingency values were calculated for the feature of communication intent for TBI group and normal group. the value shows that there is an association found between the TBI group and normals i.e. both the groups exhibited the same behaviors for the features like “Greets others”, “Introduces self”, “starts a conversation”, “asks for information”, “agrees to a part in the conversation”, “disagrees to a part in the conversation”, “fabricate events”, “understands advancers in communication”. Two features i.e. criticize in the conversation and understanding blockers in the conversation showed no association between the TBI group and the normal group.

One of the major reasons for the similarity found between the two groups is that only an excellent converser will follow all the manners in conversation, especially when the conversation is an informal one. Also, the TBI group did not have any problem in understanding the advancers in communication but they had problems in understanding the blockers in conversation. This fact is very well supported by literature (Rehak, 1992). Based on these results we cannot conclude that communication intent is affected in individuals with TBI.

- ❖ **Turn taking:** Turn taking is another important feature of conversation which is affected in TBI individuals. Under “turn taking” five features were considered. Frequency of occurrence of each feature was counted and considered as raw data. The results of t-test show that features like ‘non contingent turns’, ‘unable to take prosodic cues’, and ‘rapid shift’ in the mode showed significant difference between TBI group and normal group. Other two features like ‘persistence in listeners or speakers mode’ and ‘initiation of topic’ did not show any significant difference. This clearly indicates that turn taking is affected in TBI individuals. This affected conversation behavior in turn and can be probably attributed to “shifting attention” seen in TBI individuals. It seems like TBI individuals were

unable to focus on a particular sentence and hence were unable to comprehend some meanings of the sentence and hence showed these inappropriate turn taking behaviors.

- ❖ **Conversational repair:** Conversation repair is a necessary strategy present in the conversation to convey a message in an effective manner. In the study, frequency of occurrence of repair was calculated in the conversation of experimental subjects. It is seen that self correction did not show significant difference between the TBI group and normals but within self repair, repair through repetition and revisions showed significant difference and repair through clarification did not. Other initiated repair was found to be more in TBI individuals than normals. Request for clarification did not show any difference. Use of more number of repetition and revision repair strategies by TBI group could be because of the disfluency and reduced information content by them so they could not elaborate on the topic. As the speech of TBI subjects is more non-coherent and disfluent other initiated repair was found to be more.

Conclusion

The past decade has seen an enormous shift in the study of verbal deficits following traumatic brain injury. There is a strong agreement that discourse skills, rather than performance on the tests of discrete linguistic functioning should be the focus of assessment of speech in TBI subjects. Most of the TBI subjects who pass traditional aphasia batteries, show persisting discourse impairments. So it is not justifiable to administer language tests on TBI individuals and to declare them as having no impairment. Keeping this need in mind an effort was made to formulate a severity scale which will help to assess discourse impairment even if they pass in aphasia batteries. It is concluded that TBI individuals have impairment in discourse when compared to normal subjects because of the sustained nature of injury. This impairment was significantly different for few features for few parameters. Also a variation in the discourse pattern was evident for subgroups of TBI viz RHD subjects showed a verbose pattern with extra elaboration and inability to maintain topics of conversation. On the other hand, LHD group showed less conversational output with minimal responses and reduced informativeness. Even though a difference in the conversation traits was seen in various subgroups, the data is not sufficient to generalize the obtained findings.

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