LANGUAGE IMPAIRMENT IN HEAD-INJURED PATIENTS

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Dedicated to

Late Prof .Charles Van. Riper,

my inspiration

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CERTIFICATE

This is to certify that this dissertation entitled ***"LANGUAGE IMPAIRMENT IN HEAD-INJURED PATIENTS"*** *is the bonafide work in* ***part*** *fulfilment for the degree of* ***"Master of Science (Speech and Hearing)",*** *of the student with Register No.* ***M*** *9305.*

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*This is to certify that this dissertation entitled "LANGUAGE **IMPAIRMENT IN HEAD-INJURED PATIENTS"** has been prepared under my supervision and guidance.*

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MAY, ,1995

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DECLARATION

This dissertation entitled ***"LANGUAGE IMPAIRMENT IN HEAD-INJURED PATIENTS"*** *is the result of my own study under the guidance of* ***Dr. PRATIBHA KARANTH,*** *Professor and Head of the Department of Speech Pathology, All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier at any university for any other diploma or degree.*

MYSORE ***(REG NO. M 9305)***

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CHAPTER I

INTRODUCTION

Traumatic brain injury (TBI) has been identified as one of the largest contributors to death and disability among children and adolescents (Frankowski, 1985; Goldstein and Levin, 1987). (cited in Martin, 1988). Atleast 10% of the individuals who survive a significant head injury (HI) are likely to have residual deficits that result in total and permanent incapacity (Kingston, 1985). Majority of them suffer from some transient cognitive, motor or sensory aberration and somewhere between 40% to 80% of these patients have residual physical, intellectual or behavioral deficits (Fisher 1985; Levin et al, 1982; National HI foundation, 1982) (cited in Bigler, 1987 a).

Head injuries are of two types : open and closed. In open HI, the brain or the meninges are exposed while in closed head injury (CHI), meninges remain intact even though the skull may be fractured. In CHI, there are two categories of brain injury namely primary and secondary. Primary injuries occur immediately following impact. Secondary brain injuries include epidural hematoma, acute subdermal hematoma, intracerebral hematoma, hypoxia, brain stem compression and cerebral edema (Pang, 1985).

Complications of HI include skull fractures, concussion, contusions and lacerations, increased intracranial pressure and

traumatic vasopasm. While any part of the brain may be damaged as a result of trauma, the frontal and temporal lobes are the areas most commonly affected because of the skull brain interface in these regions.

A significant BI is felt to have occurred in the presence of one or a combination of the following three events:

(a) alteration in the level of consciousness sufficient to produce a Glasgow Coma Scale (GCS) of 14 or lower;

(b) post traumatic amnesia (PTA) of 5 min. or greater;

(c) the presence of physiologic findings (e.g. EEG), radiologic evidence (e.g. CT, MRI) or objective physical exam findings (e.g. paralysis, aphasia, sensory deficit) (Bigler, 1987b).

Clinical sequelae of tissue damage may comprise of concussion and disturbance of consciousness, motor system disorders, disorders of memory and learning, disorders of emotion and behavior and hypothalamic pituitary disorders. Diffuse axonal injury (DAI) appears to be the substrate that produces the generalized effects of cerebral injury. Cortical contusions were more commonly encountered in falls and direct blows to the head, whereas DAI was more commonly encountered in high speed acceleration-deceleration injuries such as motor vehicle accidents.

Evidence of language processing deficit on testing in the absence of clinical manifestations of classical aphasia is a frequent sequel of CHI which is termed as a "subclinical aphasic

disorder" (Sarno, 1980) (cited in Levin, 1991). Other terms like "Language of confusion" and "nonaphasic language disturbances" have also been used (Halpern, Darley and Brown, 1973; Prigatano, 1986) (cited in Ylvisaker, 1992).

Memory deficits are the most common cognitive disorders following HI. The most prominent feature of the memory deficits is a complete and permanent loss of the ability to recall numbers, events and names several minutes after learning them, although immediate recall is possible. An associated retrograde amnesia of variable duration is always present.

Missile injuries that result in aphasia also commonly produce motor and/or sensory deficit contralateral to the dominant hemisphere; this association is stronger than in the case of CHI (Levin, Grossman and Kelly, 1976). (cited in Levin,1991). Distinctive features of traumatic aphasia are:

1) Predominance of anomia (Heilman, Safran and Geschwind, 1971; Penn and Cleary, 1988).

2) Verbal paraphasia and circumlocution

3) Wernicke's aphasia (Levin, 1990).

4) Global aphasia with jargon, prolonged PTA, and residual memory deficit (Russell and Espir, 1961).

5) Focal temporal wounds damaging the optic radiations resulted in a visual field defect in addition to global aphasia. Impairment of reading was common in these patients.

Sohlberg and Mateer's (1989) 1-year and 5-year follow up studies of individuals with TBI reported changes in both personality and behavior (slowness, tiredness, rapid mood changes and bad temper) (cited in Meichen baum, 1993).

Hagen (1981, 1984) (cited in Hagen, 1988) described four areas of assessment in head trauma. The areas included categorizing spontaneous responses to random environmental stimuli, scaling responses to stimuli not controlled by the patient; administering a language battery and assessing cognitive and verbal abilities.

Ylvisaker and Szekeres (1986) (cited in Marquardt et al, 1988) noted that the formal test situation may mask the deficits of the BI patient as formal testing provides a quiet environment without distraction. So formal testing results need to be cross checked.

Executive system assessment is also done to determine the individual's ability to accurately perceive and interpret real world situations and creatively plan, initiate, monitor evaluate and adjust responses to challenging situations as they relate to personal goals (Stuss and Benson, 1986) (cited in Meichen baum, 1993).

Recovery of a patient can be monitored by the use of two commonly used scales. Rancho Los Amigos scale of cognitive levels (Hagen, 1981) and Glasgow coma scale (Tealsdale and Jennett, 1977) (cited in Ylvisaker, 1992).

6) Ideomotor apraxia - Apraxia, including laryngeal as veil as rticulatory apraxia, is common early in recovery, but often resolves spontaneously. (Ylvisaker, 1992).

The early postcomatose stage of recovery from CHI is typically characterized by an amnesic condition during which the patient is confused. Reduplicative paramnesia i.e, the mistaken identification of a person; place or event for one previously experienced, confabulation and profound impairment of memory may be misinterpreted as signs of language disorder. In the early months following severe TBI, it is widely accepted that:

(a) severe speech impairment may be either transient or persistent (Blackstone, 1989; De Ruyter and La Fontaine, 1987).

(b) severity of cognitive deficits appears closely tied to recovery of speech (De Ruyter and La Fontaine, 1987; Yorkston et al, 1989) and

(c) functional speech may return months or even years post onset (Beukelman and Garrett, 1988; Ladtkow and Culp, 1992) (cited in Ladtkow, 1993).

When given complex problems that require multiple steps, TBI patients tend to respond impulsively to early stimuli and fail to analyze or execute the component steps required for problem solution (Stuss and Benson, 1984). (cited in Meichen baum, 1993).

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From a rehabilitation planning perspective, these stages can be grouped into three general phases. Early phase (corresponding with Rancho Los Amigos levels I - III), Middle phase (levels IV - V), and Late phase (VI-VII) (Blackstone 1989; Ladtkow and Culp, 1992) (cited in Ladtkow, 1993).

Rehabilitation of TBI is a long term procedure. Stuss and Benson (1984) (cited in Meichen baum, 1993) proposed that the rehabilitation efforts of TBI individuals "should be directed to their executive dysfunctions". Different approaches used are behavioral intervention, cognitive strategies, community based services and augmentative communication. The dominant trend in all areas of rehabilitation is towards a more functional holistic approach.

Due to the lack of such studies in the Indian context, the present study was undertaken. Much of this work regarding head injury and its sequelae, assessment and rehabilitative management has been carried out in the West over the last couple of decades. As of date very few such studies have been carried out in India. However, head injury is an increasing phenomenon here too and hence this study on speech-language characteristics of the head injured in the Indian context.

REVIEW

CHAPTER II

REVIEW

A number of studies have been done on the communication deficits of the head injured patients - both closed head injury (CHI) and open head injury (OHI) taking different parameters like location, side of head injury and language characteristics (i.e., discourse, cohesion, conversational errors, clause structure, pragmatics etc.). This section presents an overall view of literature on language deficits in the head injured population.

OHI vs. CHI:

In general, a comparison was made between the two major types of HI. Darley (1982) (cited in Murdoch, 1990) reported a better prognosis for the language disorder following CHI than for the communication deficit associated with open head wounds.

Groher (1983) (cited in Murdoch, 1990) indicated that open HI patients exhibited language deficits for a longer period than did CHI patients. Further, the reanalysis of Luria's (1970) work showed that, in the initial period post-trauma, the patients with CHI as a group suffered fewer communication deficits than patients with penetrating head wounds.

Location of the lesion:

The extent to which intellectual processes were preserved as a function of preinjury 'intelligence' and of size and location

of the brain lesions was evaluated in Vietnam war veterans who survived penetrating missile wounds. With regard to an overall post injury intelligence test score, preinjury intelligence was most predictive, size of lesion was next most predictive and lesion location was least important. Even when overall intellectual ability appeared to remain relatively unaffected fifteen years following penetrating brain injury, more specific cognitive and mood dysfunction would certainly result (Grafman et al, 1985, 1986; Salazar et al, 1986). Specifically left temporal and occipital lesions impaired performance an subtests assessing vocabulary and object function matching ability (Grafman et al, 1988).

Overall language ability:

Novoa and Ardila (1987) analyzed the language abilities of 21 patients with prefrontal lesions and fifteen matched normal subjects using a linguistic ability test designed to evaluate performance in six areas; automatic language, language production, verbal memory, syntax, derivative words and comprehension of logical grammatical structures. They found the following:

a) All of the patients conserved the repetitive and imitative levels of language.

b) Patients of left and right hemisphere groups behaved as a homogeneous group with respect to the evident problems in conceptualization, comparative construction and negative

sentence analysis.

c) Infantile thought phenomenon such as concretise, fragmentation and conceptualization impossibility were observed in both groups. More frequent in left hemisphere.

d) Problems with linguistic functions were more typical in cases of left prefrontal damage.

e) Apathy, adynamia, perseveration and impossibility to perform verbal tasks were problems found in patients with left prefrontal damage.

f) Emotional disinhibition and free association ideas were problems observed in patients with right prefrontal damage.

The American speech, language and hearing association has grouped the language characteristics found in head injured cases under the heading "cognitive - communicative" impairment (ASHA, 1988) (cited in Ylvisaker, 1992). This category includes communicative challenges associated with the cognitive and executive system impairments common in TBI:

- disorganized, tangential, wandering discourse, including conversational and monologic discourse (e.g. spoken or written narratives);

- imprecise language and word retrieval difficulties;

- disinhibited, socially inappropriate language; hyperverbosity; ineffective use of social and contextual cues; restricted output, lack of initiation;

- difficulty comprehending extended language (spoken or written) especially under time pressure; difficulty detecting main ideas;

- difficulty following rapidly spoken language,

- difficulty communicating in distracting or stressful environments;

- difficulty understanding abstract language, including indirect or implied meaning;

- inefficient verbal learning and verbal reasoning.

Social relationships and academic performance are frequent victims of the language and communication challenges associated with TBI.

Language and memory:

One of the earliest studies was that of Groher (1977) who studied the memory and language skills of fourteen patients who had suffered closed head trauma, after they regained consciousness and at one month intervals for four months utilizing the Porch Index of communicative ability and Wechsler memory scale. Significant improvement in both language and memory functioning most often occurred during the first month after regaining consciousness, although gradual improvement in both language and memory skills was noted beyond the one month period. No significant correlations existed between the length

of unconsciousness and the initial and final language and memory scores.

In 1986, Payne Johnson evaluated twenty CHI and fifteen control subjects after all CHI subjects were alert and conscious. The results implied that CHI had an immediate generalized effect upon the cerebral mechanisms subserving intelligence, speech, language, memory and specific writing, reading and arithmetic skills and that the differences seen in automatic speech and oral motor skills appeared to be dependent upon the severity of the traumatic HI. He recommended that all CHI patients undergo assessment for communication competence regardless of the level of severity of the trauma.

Nonfluent aphasia:

Ludlow et al (1986) examined men who sustained penetrating head injuries resulting in nonfluent aphasia within six months following injury; fifteen years later arid classified them into two groups-13 with persistent nonfluent aphasia and 26 without symptoms of aphasia. The pattern of language deficits evident in chronic nonfluent aphasia was one of pervasive syntactic deficits in all language modalities, greater impairment in function words, speech repetition deficits, impaired morpheme expression and good retention of semantic and phonological faculties. Speech production defects were not characteristic of this group. The following brain regions were lesioned; the anterior cortical area (containing Broca's area), the middle cortical regions (containing the central sulcus), and the

anterior subcortical white matter. Results demonstrated that when lesions involved the cortical regions, the underlying white matter and the basal ganglia, long term recovery is precluded.

In 1989, Luzzatti, Willmes, Taricco, Colombo and Chiesa studied language disorders after severe HI in 30 young adult patients. In addition to the Italian version of the Aachen Aphasia test, all patients were administered further neuropsychological tasks for the detection of associated attentive disorders, disorders of verbal memory and of language related cognitive abilities. One third of the patients were classified as having aphasia, mostly of nonfluent type; another third showed only dysarthria.

Campbell and Dollaghan (1990) examined the spontaneous expressive language abilities of nine severely brain injured children and adolescents and their age - matched normal controls, seven times over a 12 month period following injury. Results suggested that the prognosis for clinically significant improvement in severely brain injured subjects was good; however, deficits in expressive skills remained apparent upto atleast 12 months following injury.

All the three studies supported the notion that HI results in nonfluent aphasia.

ANOMIA:

It is considered as one of the distinctive features of traumatic aphasia (Heilman et al, 1971; Penn and Cleary, 1988).

Also, Sarno and Levin (1985) concluded that severe diffuse brain damage was related to persistent, generalized linguistic deficit associated with overall cognitive impairment whereas focal left hemisphere lesions were compatible with complete recovery or partial resolution of aphasia with residual anomia.

Conversational errors:

In 1989, Parsons, Lambier, Show, Couch and Mooney attempted to provide a general description of the types of conversational errors in CHI. They noted fewer conversational errors during the simple introductory questions and the open ended questions. The most frequent conversational errors included linguistic nonfluency, revision behaviours and inability to structure discourse. Quantity errors appeared to be equally distributed across the types of conversational error behaviors in that category. Results suggested that there was a great deal of individual variability in conversational errors, but that most patients with CHI made a substantial number of conversational errors and that those errors varied with the type of conversational task involved. Remission behaviors and linguistic nonfluencies suggestive of planning processes, might contribute to the perception of "verbosity" in the individual with CHI. Some errors might be due to the inappropriate use of strategies to compensate for an underlying linguistic deficit.

Word fluency:

Lohman, Ziggas and Pierce (1989) used common categories to assess word fluency performance in CHI subjects. Results indicated that the subjects with CHI retrieved significantly fewer examples than did non-brain damaged subjects. This suggested that their retrieval problems existed independent of the type of category used. Performance on the word fluency task did not significantly relate to confrontation naming skills.

Ad-hoc categories were most frequently used for assessing word fluency skills in subjects with CHI (Halverson et al, 1986; Sarno, 1984). Word fluency performance, as measured by the number of words produced, was sensitive to the presence of brain damage but did not differentiate between types of brain damage (Wertz, Dronkers and Shubitowski, 1986) (cited in Lohman et al, 1989).

In yet another study, two hundred and eighteen brain injured trauma patients with confirmed diagnosis of initial CHI completed two types of work fluency generation tasks, animal naming and single letter based word generation. Numbers of responses and inferred strategy utilizations were examined and compared with established norms for non-brain-injured individuals. A positive relationship was noted between level of cognitive functioning and number of word associates generated. Same initial CV syllable (sea-seed), semantic association (ship-sail), and same initial consonant-consonant blend (tree-trick) strategies were used by all subjects regardless of severity of injury (Gruen, Frankle and

Schwartz, 1990). It supports the theory regarding typical disruption of organizational and categorization skills in the traumatically brain injured population (Schwartz-Cowley and Gruen, 1986).

Cohesion strategies:

Mentis and Prutting (1987) examined the cohesion strategies used by three normal and three HI adults in both conversational and narrative conditions. They found that the HI subjects used different cohesion patterns from the normal adults in both conditions. Also, both groups used different cohesion patterns in conversational and narrative conditions. the CHI subjects used fewer cohesive ties than the normal subjects in the narrative condition, and in both conditions they used different proportions of referential, elliptical, conjunction and lexical ties. They also used incomplete ties, a feature that was not characteristic of the normal subjects. The CHI subjects thus evidenced reduced ability to establish the intersentential semantic relations that are necessary for the formation of a cohesive tie. The use of different cohesion patterns by the CHI subjects appears to be related to their reduced linguistic processing abilities and to their limited pragmatic abilities.

Discourse:

The most prominent finding in the patient's discourse was their inability to organize information, as reflected by their excessive perseverations, digressions, confabulations and use of

stereotyped phrases (Kaczmarek, 1984) (cited in levin, 1991).

In 1985, Hartley and Jensen suggested subgroups of HI patients in terms of discourse production.

a) 'Inefficient' discourse : characterized by excessive productivity, increased dysfluency and accurate, even excessive content. These individuals were similar to normal speakers in terms of cohesion and syntactic complexity and they performed relatively well an language and memory tests.

b) 'Impoverished' discourse; characterized by short discourses consisting of short utterances, unfilled pauses and few dysfluencies. Cohesive ties were essentially absent and the semantic content was limited and very concrete.

c) The third profile was found among the patients with the most recent injuries whose discourse was labeled 'confused' in that frequent word or phrase repetitions and revisions and large amounts of inaccurate content were produced.

Ehrlich (1988) compared the narrative skills of HI and normal adults on the amount, rate and distribution of information in a picture description task. The HI adults (6 months post injury) were similar to the adults in all respects except for the slower rate of information imparted. This decreased efficiency of communication was related to the HI adults' lengthier and slower verbal outputs. They required relatively more words and time to convey the essential information.

Liles, Coelho, Duffy and Zalagens (1989) analyzed sentence production, intersentential cohesion and story grammar in a group of 23 normal young adults and 4 CHI adults who had reached a high level of language recovery. Results demonstrated that the two elicitation tasks (story retelling and story regeneration) differentially influenced the performance of both normal and CHI subjects' at all levels of analysis, and the two groups differed in the cohesive and story grammar measures only in the story generation task. The multileveled analysis indicated that the CHI subjects discourse limitations were least evident at the level of sentence formulation, regardless of the task, and most evident in the linguistic and cognitive organization of the text. They concluded that comparing performance across tasks of story retelling and story generation was a useful procedure for characterizing the discourse problems of CHI subjects with recovery of high level language skills.

In 1992, Chapman, Culhane, Levin, Harward, Mendelsohn, Ewing-Cobbs, Fletcher and Bruce examined narrative discourse in 20 children and adolescents atleast one year after sustaining a HI. The most important finding which emerged was the disruption in information structure. In view of recent evidence that frontal damage was associated with discourse formulation deficits in adults and was the most common site of focal lesion in CHI, the discourse patterns in individual patients with frontal lobe lesions were examined and were found similar to those reported for adults with frontal lobe injuries.

Discourse deficits identified in CHI children and adolescents include problems in interpreting both ambiguous sentences and metaphors, drawing inferences and formulating sentences from key words (Dennis and Barnes, 1990). Additionally sentential complexity within discourse was reportedly simplified.

Clause structure:

In 1990, Hartley and Levin studied the linguistic deficits after CHI. In 1986, Hartley reported that CHI patients used fewer clauses per utterance. Of their utterances in narrative discourse, 50 - 70 % were single independent clauses, with less use of complex constructions than normal adults. In 1988, Hartley and Seofelia found that HI patients produced discourses of the same length as normal speakers in terms of time, utterances and words. However, their narratives contained less of the target content and more dysfluencies. In addition, the CHI patients spoke more slowly than normal speakers.

Pragmatics :

For examining everyday communication, three major types of pragmatic behaviors are included : (Prutting and Kirchner, 1983, 1987) (cited in Hartley, 1992).

a) Non verbal - includes nonlinguistic modes of communication - paralinguistics (Prosody, vocal quality, loudness, speech intelligibility and fluency), Kinesics (body movements, facial expressions, eye gaze, posture and gestures) and proxemics (social and personal space);

b) Interactional e.g. turn taking and conversational (Me Tear, 1985);

c) Propositional - Topic considerations, presupposition, cohesion and discourse organization or grammar are included in this category. Topic management is a key component of discourse coherence (Mentis and Prutting, 1991; Scinto; 1977; Van Dyke, 1977).

The ten pragmatic behaviors that Mere most frequently judged to be inappropriate in the HI group were prosody, affect, topic selection, topic maintenance, turn taking initiation, turn taking, pause time, turn taking contingency, quantity/conciseness and fluency. The highest proportion of inappropriate pragmatic behaviors exhibited by the HI adults was the illocutionary or perlocutionary act, suggesting that breakdown most often occurred in the way that HI adults functioned as discourse partners (Prutting and Binder, 1984).

In 1990, Dennis and Barnes studied pragmatic communication in 33 children and adolescents following CHI. Three quarters of the sample was impaired on atleast one of four discourse tests (knowing the alternate meaning of ambiguous words in context; getting the point of figurative or metaphoric expressions; bridging the inferential gaps between events in stereotyped social situations; and producing speech acts that express the apparent intentions of others). Resolution of ambiguity was correlated with word fluency and verbal domain knowledge but not

with object naming; understanding of metaphor was correlated with verbal domain knowledge but not with literal sentence comprehension or with the formation of analogies; making inferences was correlated with working memory capacity but not with social knowledge; and producing speech acts was not correlated either with sentence construction or with social knowledge.

Anecdotal evidence suggested that non-aphasic CHI patients; while able to use basic linguistic processes normally, frequently had difficulty adapting their entire productions to meet the specific needs of the context (Me Donald, 1993).

Language impairment as indicator of severity:

Levin et al (1981) (cited in Levin, 1991) investigated the long term recovery of language function in 21 CHI patients initially diagnosed as aphasic. He found that the severity of diffuse CHI (as indicated by the duration of coma) significantly correlated with deficits evident on visual naming and language comprehension tasks.

Sarno (1980, 1984) (cited in Levin,1991) found that word finding ability was the best predictor of the severity of linguistic disorders resulting from CHI.

On the contrary, most investigators have reported no relationship between duration of coma and severity or persistence of language disturbance (Sarno et al, 1986; Brooks et al, 1980).

Sarno (1991) concluded that prolonged coma was neither a necessary nor a sufficient condition for residual aphasia.

Recovery patterns:

Levin et al (1981) investigated the long term recovery of language function in 21 CHI patients initially diagnosed as aphasic. Three general patterns of language recovery were observed.

1) Full language function was generally recovered if the HI was initially mild with a hematoma in no more than one hemisphere, even when some ventricular expansion remained post traumatically.

2) In other instances of mild CHI, specific expressive language deficits were retained, for atleast 6 months post onset, characterized by anomia in the absence of any cognitive deficit or severe disability.

3) More severe CHI involved diffuse swelling and bilateral hematomas correlated with persistent expressive and receptive impairment (generalized linguistic disturbance) atleast one-year post injury. These latter subjects typically exhibited residual anomia, reduced word association abilities and deficient comprehension skills, accompanied by a global cognitive deficit for both verbal and visuospatial material. Repeat CT scans at this stage showed dilatation of the ventricular system and minimal or circumscribed cortical atrophy.

Assessment:

Goals of assessment are :

a) Delineation of communicative strengths and weaknesses, formulation of a prognosis.
b) Determination of underlying causes of manifest disability, and
c) Development of appropriate treatment strategies (Groher and Ochipa, 1992).

Many will perform in the normal range on standardized cognitive measures because the structure of the tasks helps to compensate for their disability (Bigler, 1988). Only in situations that do not provide structure, as in executive level planning that assists one in solving life's everyday dilemmas, are their deficits manifest (Lezak, 1982). Some communication batteries designed primarily to measure communication deficits following BI, such as PICA (Porch, 1981) and the Western Neurosensory stimulation profile (Ansell and Keenan, 1989) provide predictive information based on initial test scores.

Because individuals with TBI often present with combinations of disorders which interact to produce unique disabilities, a battery of standardized measures is useful in deriving a meaningful and comprehensive profile of abilities (Groher and Ochipa, 1992).

Total reliance on standardized measures for individuals with TBI many be confounded by the variability in severity on initial

presentation and by courses of recovery that are complicated by medical or surgical interventions. Individuals with severe impairment may test poorly on standardized examinations, but be independent communicators (Sohlberg and Mateer, 1989). For those whose impairment is mild (Rancho level III), standardized measures often are not sufficiently sensitive to detect or describe the pathology (Hagen, 1982; Groher, 1990). Consequently, multiple administrations of the same battery months after the injury are necessary in order to compare and/or detect a disability.

Individuals who present initially with severe cognitive disturbances of attention and concentration and generalized unresponsiveness to the environment are not candidates for most standardized assessment tools. Documentation of an individual's responsiveness to basic environmental stimuli often must be done with nonstandard, but repeatable measures. The reliability of the standardized measurement tool is improved when the individual undergoing assessment is able to cooperate for an extended period of time.

Standardized assessment measures of communication fail to describe an individual's ability to communicate functionally in real-world contexts (Sohlberg and mateer, 1989; Coelho et al, 1991). Some of the functional assessment methods (Hartley, 1992) are:

1. Environmental needs assessment - To determine the communicative demands and expectations that are placed on the

individual by his/her culture and environment, both current and projected.

2. Assessing integrative behaviors that require coordination of component cognitive and linguistic skills and systems.

3. Assessing everyday listening skills - Brooks and colleagues (1987) found comprehension of conversation, especially when more than one communication partner was involved, to be a frequent problem following HI.

4. Assessing everyday speaking skills:

Speaking performance of individuals with TBI has been shown to vary with changes in setting or task (Brooks et al, 1987; Hartley and Jensen, 1991; Mentis and Prutting, 1987; Milton, Prutting and Binder, 1984) (cited in Hartley, 1992). So conversational abilities in a variety of natural settings with different communication partners should be observed and measured, through systematic observations of clients unstructured conversations.

Other methods are :

Assessing pragmatic and social behavior

- Role playing

Evaluating clients' everyday speaking ability by eliciting monologic in contrast to conversational discourse.

All these studies make us realize the various types of language features affected in the HI population. These range

from gross impairments like non-fluent aphasia and disorganized discourse to subtle defects like word retrieval problems. The review justifies the label "sub-clinical aphasic disorder" as most of the defects in areas like discourse and word fluency are not obvious in routine aphasia testing.

It is essential, more so in India, for us as speech-language pathologists and as important members of the rehabilitation team to be aware of these impairments and to appreciate the need for extensive testing in HI cases. Hence the present study was undertaken as an attempt to delineate the various language characteristics of head injured patients.

METHODOLOGY

CHAPTER III

METHODOLOGY

Aim: The aim of the present study was to study language impairment in head-injured patients.

Subjects: Ten adults (above 18 years) with a significant HI were taken as the subjects of this study.

Criteria: The criteria for the subject selection were :

1) Significant HI

2) Age above 18 years

3) Education atleast up till primary level

4) Should know Hindi as the first or second language

5) Time elapsed since HI - one month or less than one month. Two of the cases did not fulfill this condition. One had a post-injury time period of 1 month 10 days while the other had a post onset period of 3 months.

These two subjects were included in the study as the data collection was time bound and the subjects with a post onset period of one month or less than one month were not available within the time limit.

Data collection was done at the Neurosurgery section, Post graduate institute of Medical education and research, Chandigarh.

Particulars:

All the cases had a GCS of 14 or 15 except for one who had a GCS of 9 (See appendix). Male to female ratio was 7 : 3. Of the ten subjects, six had a road-side accident (RSA), two had a fall, one had a history of assault and the other of trauma (See Table 1)

Based on the CT scan reports, three of them were found to have contusions, three had hematomas, one had a fracture of the temporal bone, one had focal seizures while one had abrasions and one of them didn't have any abnormality. Four of these cases had undergone surgery for their secondary injuries.

Other problems which the subjects had were loss of consciousness (LOC), loss of memory (LOM), diplopia, headache and giddiness. One of the subjects had right hemiplegia and (L) VIIth nerve palsy (Table I).

Tools:

The tools used in the present study were :

a) Language history
b) Western Aphasia Battery (WAB) (Kertesz, 1982)
c) Linguistic Profile test (LPT) {Karanth, 1980)

The Hindi version of WAB and LPT were taken. Before we start with the procedure, just a brief description of the tools.

TABLE I : PRESENTS THE SOCIAL ANT) MEDICAL HISTORY OF SUBJECTS

Case No.	Age/Sex	Languages Known	Education	Cause	Date of evaluat-ion	GCS	Handedness	Side of HI	Associated prohblems
1	46/M	Hindi, English	M.Com	RSA	12 days post onset	9	R	R	L0M-4 days LOC, Focal {seizure:;
2	30/M	Hindi,	Matric	Fall	18 days post onset	15	R	R	Parieto trontat contusion LOC - 1 hr.
3	45/M	Hindi,	VIII Std.	RSA	12 days post onset	15	R	R	LOC 10-12hrs Mandible and dental injury Mutiipte tacial abrasions
4	25/F	Hindi,	Inter-mediate	Fall	27 days post onset	l5	R	L	LOC - 2 -2L/2 (L) trontat contusion
5	75/M	Hindi, Dogri, Punjabi	Matric	RSA	19 days post onset	14	R	R	Temporal ICH and bitrontal SDR surgery
6	21/F	Hindi, English, French, Punjabi :	B.Ed., ITFT	RSA	41 days post onset	14	R	R	Fronto temporat contusion surqcry Fronto-tempo-rat trophine

Case No.	Age/Sex	Languages Known	Education	Cause	Date ot evaluat-ion	GCS	Handednens	Side ot Hl	Associated problems
7	44/M	Hindi, Punjabi, ENG	Inter-mediate	RSA	15 days post onset	15	R	R	No abnorma - titles dete-cted, LOC
8	18/M	Hindi, Punjabi, English, Haryanvi	B.Sc. student	RSA	6 days post onset	15	R	R	# Temp, bone LOC, Headache
9	43/F	Hindi, Pahari, Punjabi	Higher secondary	Assault	90 days post onset	15	R	L	Tempero parietal contusion, Parietat 1CH, LOW, VIIth nv paisy, (R) emipiegi a, surgery.
— — 10	54/M	Hindi, Punjabi English	Graduate	Trauma	]0 days post onset	14	R	R	Prontat-parieto occipitat Chr.SF)H, Surgery.

a) Language history:

The language history comprised of a detailed personal history, details of handedness - premorbid and postmorbid, the various languages known and to what level, language commonly used in various activities and the details of HI including different physiologic investigations.

b) WAB:

The Western aphasia battery (WAB) was designed to evaluate the main clinical aspects of language function : content, fluency, auditory comprehension, repetition and naming, as well as reading, writing and calculation (Kertesz and Poole, 1974). Non verbal skills are also tested, such as drawing, block-design and praxis.

The test can be divided into two main parts : oral language subtests (A.Q.) and visual language and other subtests.

Oral language subtests:

Spontaneous speech - This item is designed to elicit conversational speech from the patient in reply to questions asked in the context of an interview and a picture description. Changing the wording of the questions and a few encouraging comments are permitted. The information content measures functional communication. Correct response is what conveys appropriate information. This portion measures functional communication.

The second aspect of spontaneous speech is a combined score of several important dimensions. The most important aspect is fluency. The first five categories (0-4) Mill classify aphasics in a nonfluent type and the last six (5-10) in the fluent group.

Auditory verbal comprehension:

Oral comprehension is first tested by yes/no questions. The first nine questions are the most relevant to the patient's own person. The next five questions are related to the environment and the last six are more general in their content, yet remain semantically simple and short, although there is an increase in linguistic complexity requiring more comprehension of syntax, such as relational words. Auditory word recognition or word discrimination requires the patient to point to an item, which is spoken by the examiner, from an array of similar items in the same category.

Repetition:

It is tested by high frequency single words of increasing length, composite words, numbers, number-word combinations, high and low probability sentences, and sentences of increasing length and grammatical complexity. It includes test of oral agility and a test sentence that contains all the letters of the alphabet that is also used for the writing task.

Naming:

Naming of objects on visual confrontation constitutes 60% of the naming score. Twenty common prototypical objects that are easily available are shown individually.

Word fluency is 20 percent of the naming score and is measured by naming as many animals as the patient can in 1 minute.

Visual language and other subtests:

Reading and writing:

These are important parts of aphasia testing, and, although the impairment of visual verbal functions often parallel those of oral language, there are often important dissociations.

Apraxia:

Testing skilled or practiced movements is done with the unaffected limb.

Constructional, visuospatial and calculation tasks:

These tasks are not crucial for language testing, but they are often impaired in left and right hemisphere lesions as well. They measure complex cognitive processes that are perceptual, associative and motoric at the same time.

The Aphasia quotient (A.Q.):

The calculation of the aphasia quotient provides a summary score that is a reliable measure of the severity of language impairment (kertesz and Poole, 1974; Kertesz, 1979). The total scores of the oral language subtests are added (maximum - 50) and simply multiplied by 2 to obtain the A.Q. The cortical quotient (C.Q.) is a summary score of all the cognitive functions measured with this test in aphasics.

c) LPT:

The linguistic profile test (LPT) was designed with the objective of evaluating and analyzing adequate linguistic samples at the phonological, syntactic and semantic levels. The test was originally designed a decade ago (Karanth, 1980) in Kannada. A parallel version of the test was developed in Hindi (Karanth, Pandit and Gandhi, 1986).

The LPT has three major sections dealing with Phonology, Syntax and Semantics respectively, with discourse forming the tail end of the third section. The choice of methods within these sections covers a wide range of tasks such as pointing, repetition, naming, indication of grammatical and semantic acceptability, listing of lexical categories, sentence completion, matching synonyms and antonyms etc. [Karanth 1980] (Cited in Suchitra et al, 1990).

The first section Phonology' has three further sub-sections: Phonemic discrimination, phonetic expression and running speech. Of these, running speech is not scored. Syntax' forms a major section of the test. It has eleven subsections namely morphophonemic structures, plural forms, tenses, PNG markers, case markers, transitives, intransitives and causatives, sentence types, predicates, conjunctions, comparatives and quotatives,conditional clauses and participial constructions.

The third section 'semantics' has two main divisions Semantic discrimination and semantic expression. Semantic expression has eleven subsections which include naming, synonyms, paradigmatic relations, semantic contiguity etc.

The three sections have a score of 100 each with a grand total of 300.

In the discourse section, there were three pictures which the subjects had to describe and they also had to talk on any topic for five minutes. The first picture was a market (fair) scene in which there was a bookhouse, a sweets shop and = balloon seller. People were scattered all around buying things and Children were buying balloons. In the second picture, there were three scenes. In one, a teacher was teaching in a classroom, in the second, children were playing football and in the third one, boys were doing P.T. exercises. The third picture was a village scene with a bullock cart, a number of huts and a lady milking a

cow. The discourse was recorded on audio casettes (Meltrack) using a Philips tape recorder.

These tools were taken up to assess mainly the language aspect in detail. WAB gave an overall picture of the language deficits seen in HI cases. LPT served to study discourse and syntax in detail.

Procedure:

Initially a detailed language history was taken. First, WAB was administered for all subjects followed by LPT. The subjects were given a rest period whenever they got tired. Both WAB and LPT were administered on the same day. Tests were scored and a detailed analysis of discourse was done.

The results are presented and discussed in the next chapter.

RESULTS & DISCUSSIONS

CHAPTER IV

RESULTS

The aim of the present study was to study the language characteristics of head injured cases. This was studied in a small sample size (N=10) as the data collection was time bound. Moreover, the number of difficulties during data collection made it impossible to take more cases. The difficulties encountered were dropping out of cases without informing, getting tired after 10 minutes which made it impossible to finish one test also; loss of glasses due to which the case couldn't read or write etc. There were cases with head injury but they were not literate. As a result, they could not be taken up for the study.

Before starting with the proper language tests, a detailed language history was taken which told us about the education of the patient as well as the different languages known to him and also the details of the HI. This information is summarized in Table 1. As can be seen from the table, all the cases were literate and had Hindi atleast as the second language. The mean age of the subjects was 40.1.

After obtaining this information, WAB was administered. The detailed scores of all the subjects in various sub-sections can be seen in Table 2. Spontaneous speech scores are good followed

by a similar pattern in comprehension except for a few cases (case No.l, 3, 8 and 9) who show problems in sequential commands. Repetition is within the normal range. In naming, difficulties are most evident in word fluency sub-section in a number of cases. Case No.7 has problems in sentence completion and responsive speech as well. Here, an important point is to be noted. The scores in word fluency measure do not correlate with the scores on confrontation naming.

The Aphasia quotient has been found to vary from 77.4 to 94.9. Taking all these sub-sections scores into account and using the criteria of classification (Kertesz, 1979); these subjects fall in the Anomic group. Hence, all the subjects of the present study were classified as Anomics.

The scores obtained in this test were compared with the available Western (Kertesz et al, 1979) and the Indian (Karanth et al, 1991) norms. (See Table 3). It is quite evident from the table that the subjects of the present study have fared better than the Anomics subsequent to stroke, studied in the earlier work but are worse than the non-aphasic brain damaged and the normals.

TABLE 2 : DETAILS OF THE SCORES OBTAINED IN DIFFERENT SUB-SECTIONS ON WAB

SECTION	MAXIMUM	CASE NUMBER									
		1	2	3	4	5	6	7	8	9	10
I Spontaneous speech											
Information content	10	9	8	9	9	6	9	9	9	9	6
Fluency	10	9	9	9	9	6	9	9	9	9	8
II Comprehension											
Yes/No questions	60	54	51	51	54	57	51	51	51	60	54
Auditory word recognition	60	60	58	55	59	59	60	58	58	60	58
Sequential commands	80	59	68	56	80	74	75	67	56	63	70
III Repetition	100	92	98	94	100	85	100	93	100	100	100
IV Naming											
Object naming	60	60	60	55	60	60	60	60	60	60	60
Word fluency	20	8	13	7	18	11	12	14	7	4	18
Sentence completion	10	10	6	6	10	8	10	4	10	8	10
Responsive speech	10	10	6	10	10	8	10	2	10	10	10
A Q		88.50	88.30	86.60	94.90	77.40	93.0	88.20	89.90	90.70	85.80

SECTION	MAXIMUM	CASE NUMBER									
		1	2	3	4	5	6	7	8	9	10
V Reading	100	73	84	78	84	90	92	69	92	84	92
VI Writing	100	78	88.5	67.5	75	65	86	77.5	88	35.5	93
VII Praxis	60	60	60	57	60	60	60	60	60	60	60
VIII Construction											
Drawing	30	19	17	11.5	11.5	13.5	26.5	21	23.5	12	28
Block design	9	5		3	6	6	9	9	9	9	9
Calculation	24	24	24	24	24	24	24	24	24	24	24
Raven's score	37		**						—	-	

TABLE 3 : COMPARISON OF SCORES OBTAINED IN THE PRESENT STUDY ON WAB, WITH THE WESTERN AND INDIAN NORMS

	HI -- PRESENT STUDY		KERTESZ et al, 1979						KARANTH et al, 1991			
			ANOMICS		NON-APHASIC BRAIN DAMAGED		NORMAL		ANOMICS		NON-APHASIC BRAIN nAMAGED	NORMAL
	M	S.D.	M	S.D	M	S.D	M	S.D	M	S.D	M	M
Fluency	8.6	0.92	8.0	0.9	10.0	0	10	0	7.9	2.0	9.5	10.0
Comprehension	8.985	0.45	9.0	0.8	9.7	0.4	9.9	0.2	8.2	0.7	9.8	9.9
Repetition	9.62	0.49	9.1	0.9	9.8	0.2	9.8	0.3	8.4	0.7	9.4	9.6
Naming	8.75	0.66	7.8	1.2	9.1	0.4	9.5	0.3	6.6	1.7	8.9	9.4
Information	8.3	1.19	7.7	1.7	9.9	0.3	10	0	7.6	1.9	9.4	9.9
A.O.	88.33	4.49	83.3	7.8	97.1	1.9	98.4	1.0	76.0	10.6	92.56	97.5
Age	40.1	-	60.3		59.4	-	59.2	-	44.4		52.0	45.0

In Table 4, we can see the Mean ± S.D. scores obtained by the subjects on reading, writing, praxis and construction sections.The scores an Praxis section and calculation are similar to those of normals. But all other skills are affected in HI cases. This is an important finding as none of the investigators except one (Groher, 1977) have reported any problems in reading and writing. These scores should be in the normal range as the reading sentences and writing tasks are of a primary level. Errors in writing consisted mainly of spelling errors and incomplete sentence construction.

WAB was followed by an administration of LPT. The detailed scores of the three major sections and their subsections can be seen in Table 5. Of the three major sections, 'Syntax' was found to be the most affected in all the subjects. This can be a major cue to the language difficulties experienced by the head-injured. The responses of the subjects on this section were cross-checked by calculating the sensitivity indices for each item and for every subject. (See Table 6). This gave us an idea of the chance responses. Case no. 8 and 10 showed the highest sensitivity index (0.91) and maximum chance responses were seen in case no.5 (A' = 10.5). On comparison of the mean sensitivity indices obtained in the present study with the Indian norms (Karanth et al, 1991), it was found that overall the present study subjects had a poorer sensitivity index. The least was seen in item A i.e, Morphophonemic structures. This suggests more problem with morphophonemic structures.

Table 7 compares the LPT scores obtained in the present study with Indian norms (Karanth et al, 1991).

HI and Normals:

Overall, the scores in all sections were considerably lower than normals. Syntax was the most affected. In Semantics, sub-item A, 1 and 6 scores (i.e, Semantic discrimination. Naming and Polar questions) were same as that of normals.

HI and other groups:

In the first section, the total score was higher in the non-aphasics.

Overall, the scores in all sections were considerably lower than normals, though syntax was the most affected. On comparison with the non-aphasic brain-damaged, the important finding was that the scores on Syntax were better in case of HI, even though the total scores and other sections were better in the non-aphasic brain-damaged. When compared to anomics (post CVA), the HI cases were found to perform better in all three sections. The head-injured scored better on most of the sub-items in both Syntax and Semantics.

Thus, on a continuum, the normals would be on one end (the highest) while anomics would be on the other. The non-aphasic Brain damaged and the head-injured would lie in between though with HI more towards the anomic end than the normal end. This gives support to the hypothesis that even mild HI have language impairments.

TABLE 4 : MEAN AND S.D. SCORES OF READING, WRITING, PRAXIS AND CONSTRUCTION

	TOTAL	M	S.D.
Reading	100	83.8	7.81
Writing	100	75.4	15.89
Praxis	60	59.7	0.9
Drawing	30	18.35	5.94
Block-design	9	6.8	2.4
Calculation	24	24.0	0

TABLE 5 : DETAILS OF INDIVIDUAL SCORES OBTAINED ON LPT

SECTION	MAXIMUM	CASE NUMBER									
		1	2	3	4	5	6	7	8	9	10
1 Phonology											
A Ph. Discrimination	48	43	44	41	46	30	46	43	46	43	44
B Ph. Expression	52	50	52	52	52	52	52	52	52	52	52
	100	93	96	93	98	82	98	95	98	95	96
11 Syntax											
A Morpho phonemic structures	10	5.5	5.5	5	6.5	4.5	4.5	5	6	6	8
D Plural forms	5	4	3	3.5	4	2.5	4.5	3	4.5	3.5	4
C Tenses		3	2.5	3	3.5	2.5	4	3	4	2.5	4.5
D PNG markers	10	7.5	8	7.5	7.5	5	9.5	6.5	8.5	8.5	8
E Case markers	10	8	7	8	6	5	9	5	8	8	9
F Transitives, intransitives and causatives	10	4	4	6	5	4	7	5	9	6	8
G Sentence types	10	6	6	4	9	5	8	4	9	6	9
H Predicates	10	8	6	6	8	4	9	6	10	8	9

SECTION	MAXIMUM	CASE NUMBER									
		1	2	3	4	5	6	7	8	9	10
I Conjunctions, comparatives and quotatives	10	5	5	5	6	5	10	5	9	6	9
J Conditional clauses	10	6	5	5	8	5	6	6	7	6	9
K Participial construction	10	5	5	5	7	5	6	5	9	5	8
	100	62	57	58	70.5	47.5	77.5	53.5	84.0	65.5	85.5
III Semantics											
A. Semantic Discrimination											
1. Colours	5	5	5	5	5	5	5	5	5	5	5
2. Furniture	5	5	5	5	5	5	5	5	5	5	5
3. Body parts !	5	5	5	5	5	5	5	5	5	5	5
B. Semantic expression											
1. Naming	20	20	20	20	20	20	20	20	20	20	20
2. Lexical category	15	8	13	7	15	11	12	14	7	4	15
3. Synonymy	5	4	1	2	3	2	5	4	5	4	4

SECTION	MAXIMUM	CASE NUMBER									
			2	3	4	5	6	7	8	9	10
4. Antonymy	5	5	4	5	5	4	5	4	5	4	5
5. Homonynty	5	2.5	2	4.5	2.5	2.5	5	2.5	2.5	4	3
6. Polar questions	10	q	10	10	10	10	10	10	10	10	10
7. Semantic anomaly	5	4	4	3	5	3	5	4	5	4	5
8. Paradigmatic relations	5	5	3	2	2	3	5	4	4	4	5
9. Syntagmatic relations	5	4	3	1	3	0	5	1	3	4	2
10. Semantic contiguity	5	2	4	3	4	3	5	4	5	4	5
11. Semantic similarity	5	4	4	4	4	4		3	5	5	5
	100	82.5	83	76.5	88.5	77.5	97.0	85.5	86.5	82.0	94.0
Total	300	237.5	236	227.5	257	207	272.5	234	268.5	242.5	275.5

TABLE 6 : SCORES AND SENSITIVITY INDICES FOR DIFFERENT SYNTACTIC STRUCTURES OF THE LPT IN ADULTS

A' = Sensitivity index.

ITEM	KARANTH et al' 91 (Literates)	PRESENT STUDY
A	0.97	0.62
B	0.98	0.82
C	0.97	0.75
D	0.98	0.68
E	0.94	0.81
F	0.89	0.75
G	0.97	0.75
H	1.00	0.86
I	0.87	0.68
J	0.97	0.73
K	0.94	0.65
	x = 0.95	x = o.8i

TABLE 7 : COMPARISON OF LPT SCORES IN THE PRESENT STUDY WITH INDIAN NORMS

	HI – PRESENT STUDY		KERTESZ et al, 1979					
			ANOMICS		NON-APHASIC BRAIN DAMAGED		NORMALS	
	M	S.D.	M	S.D.	M	s.D.	M	s.D.
I Phonology								
PD	42.6	4.48	40.5	4.5	46.6	1.01	46.9	1.05
PE	51.8	0.6	51.5	0.5	51.4	0.49	51.4	0.79
Total	94.4	4.49	92.0	4.0	98.0	1.1	98.3	1.5
II Syntax								
A	5.65	1.0	5.5	1.0	5.1	2.8	7.3	1.2
B	3.65	0.63	3.25	2.75	8.6	5.0	9.4	1.0
C	3.25	0.68	3.5	1.0	7.6	4.8	8.6	1.8
D	7.65	1.17	7.25	2.75	7.2	3.7	9.4	o.6
E	7.3	1.42	7.5	1.5	7.0	3.6	9.5	1.2
F	5.8	1.66	6.5	1.5	6.6	3.4	8.5	1.0
G	6.6	1.91	5.5	0.5	6.6	3.7	8.3	1.1
H	7.4	1.74	7.0	2.0	6.5	3.6	8.9	0.7
1	6.5	2.22	6.0	1.0	6.3	3.4	8.8	1.1
J	6.3	1.27	6.0	0	5.2	2.6	7.0	1.5
K	6.0	1.41	6.0	2.0	6.0	3.6	8.1	1.2
Total	66.1	12.31	64.0	14.o	61.0	31.7	85.0	5.9

	HI -- PRESENT STUDY		KERTESZ et al, 1979					
			ANOMICS		NON-APHASIC BRAIN DAMAGED		NORMALS	
	M	S.D.	M	S.D.	M	S.D.	M	S.D.
III Semantics								
A	15.0	0	14.5	0.5	14.4	1.2	15.0	0
1	20.0	0	19.0	1.0	20.0	0	20.0	0
2	10.6	3.62	4.0	1.0	12.35	4.8	12.9	1.2
3	3.4	1.72	5.0	0	4.8	0.4	4.8	0.5
4	4.6	0.49	3.5	1.5	5.0	0	4.9	0.4
5	3.1	0.97	2.25	0.75	4.1	1.2	4.7	0.5
6	9.9	0.3	9.5	0.5	9.8	0.4	9.9	0.3
7	4.2	0.75	2.5	1.5	4.8	0.4	5.0	0
8	3.7	1.1	4.5	0.5	5.0	0	4.9	0.4
9	2.6	1.5	4.5	0.5	5.0	0	4.9	0.4
10	3.9	0.94	5.0	0	4.8	0.4	4.9	0.4
11	4.3	0.64	5.0	0	4.8	0.4	4.9	0.4
Total	85.3	6.22	79.25	4.75	92.1	4.4	97.6	2.4
Total score	245.8	20.95	235.25	22.75	248.8	40.0	281.0	7.3

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DISCOURSE :

As stated in the methodology, the discourse was recorded using a tape recorder. The subjects had to describe three pictures and talk for 5 minutes on any topic. One normal speech sample was taken to compare the discourse of the head-injured with that of normals. The normal subject taken is a 23 year old, female student with Hindi as the mother tongue.

The three HI subjects were chosen for the discourse sample on the basis of their LPT scores. The subjects taken were case no.l, 5 and 6. Case 6 had the lowest LPT score (207), case 6 had the second highest (272.5) while case 1 was in the middle range (237.5). The subjects were chosen in such a manner so that a comparison could be made between cases with varying degrees of language impairment.

The discourse has been transcribed according to the International Phonetic Alphabet which is followed by translation in English. The discourse sample of the normal subject and the HI subjects is given below:

NORMAL SAMPLE

Picture No. 1

sʌbse pehla tʃiʈr ek bazaːr ka hɛ. jəhɑ̃ pə bəhuʈ sari ɖukanẽ ləgi huji hẽ ɔr log tʃizẽ kʰəriɖ rəhe hẽ. jəhɑ̃ pər ek miʈʰai ki ɖukaːn hɛ dʒəhɑ̃ se ek ɔːrəʈ ne miʈʰai kʰəriɖ li hɛ. ek ... ə ... kəriaːne ki ɖukaːn hɛ dʒəhɑ̃ se ek ɔːrəʈ ɔr uski ləɽki səmaːn kʰəriɖ rəhe hẽ. ek ləɽkə ɔr uske piʈaːdʒi ə gubaːre leka ə ... səɽək pər tʃəl rəhe hẽ. ɔr saːtʰ mei hi ek həlwai dʒəleibiɑ̃ ʈəl rəhə hɛ, gərəm gərəm ɔr bəhuʈ saːri ɖukaːnẽ hẽ dʒin mei se ek ɖukaːn kiʈabõ ki bʰi hɛ dʒəhɑ̃ dʰer saːri kiʈabẽ ləgi huji hẽ ɔr ek ɔːrəʈ kiʈabei kʰəriɖ rəhi hɛ. ɖukaːn mei sirf ek hi selzmən hɛ. səɽək ke upə ek bidʒli kə kʰəmbə hɛ dʒəhɑ̃ pər lait ləgi huji hɛ.

This picture is of a bazaar. Here, a number of shops are there and people are buying things. Here, there is a sweets shop from where a lady has bought sweets. There is one ..... departmental store from where a lady and her daughter are buying things. One boy and his father ... are walking on the road with balloons. And nearby only, one sweets maker is making hot-hot

Jalebis. And, there are a number of shops in which there is a book-shop also where there are lots of books and a lady is buying books. There is only one salesman in the shop. There is an electricity pole on the road where a light has been fixed.

Picture No. 2

je ʧiʈr ek pɑːʈʰʃɑlɑ kɑ hɛ dʒəhɑ̃ pər
kjɑ kjɑ kərvɑjɑ dʒɑːʈɑ hɛ, usko ɖer-
-ʃɑjɑ gəjɑ hɛ. ek kone meĩ ɑ... əɖʰiɑpək
blæk bord pər kutʃʰ ɖikʰɑ rəhe hɛ̃.
unke sɑːmne ki teibl pər ek kiʈɑːb
kʰuli huji pəɾi hɛ. sɑːmne hi kutʃʰ
bɑtʃe bæʈʰe huje hɛ̃, kitɑːbẽ kʰol
kər ke ɔr ek ləɾkɑ kiʈɑːb pəɾ rəhɑ hɛ,
hɑːtʰõ meĩ lekər ke kʰəɾɑ hujɑ hɛ.
ʃɑjeɖ əɖʰiɑpək ɑ.... usse kutʃʰ putʃʰ
rəhe hɛ̃. ɖusri lɑin meĩ ek ləɾki
bæʈʰi huji hɛ ɔr uskɑ mũh dʒo ləɾki
kʰəɾi hɛ uski ʈəɾɑf muɾɑ hujɑ hɛ.

ʃəjed̪ əd̪ʰiɛpək ke sɛ:t̪ʰ d̪usri ɔr kutʃʰ
bətʃe mɛid̪ɛ:n meĩ fut̪ bɔl kʰel rəhe hɛ̃,
ɔr fut bɔl ek kone meĩ hɛ ɔr bəhut̪
sɛ:re lər ke uski t̪ərəf bʰɛ:g rəhe hɛ̃.
wəhĩ pər ek t̪ərəf mɛi d̪ɛ:n meĩ ɛ....
kəsrət̪ kərvɛi dʒɛ rəhi hɛ. ek əd̪ʰiɛpək
bətʃõ ke dʒʰund ke sɛmne kʰəre hɛ̃,
kəsrʌt̪ kər rəhe hɛ̃ ɔr dʒæse unʰone
hɛ:θõ ko kər rəkʰɛ hɛ, wæse hi d̪usre
bətʃõne bʰi kər rəkʰɛ hɛ.

This picture is of a school where all that is done has been picturised. In one corner, , the teacher is showing something on the black-board. There is a book lying open on the table in front of him. In front only, some children are sitting with their books open and one boy is reading .... standing with a book open in his hand. Maybe, the teacher is asking him something. In the second line, one girl is sitting and her face is turned towards the boy who is standing. On the other side, some children are playing foot-ball and the football is in one corner and a number of boys are running towards the ball. Over there only, on one side of the ground, exercise is being done. A teacher is standing in front of a group of children and is doing exercise.

Picture No. 3

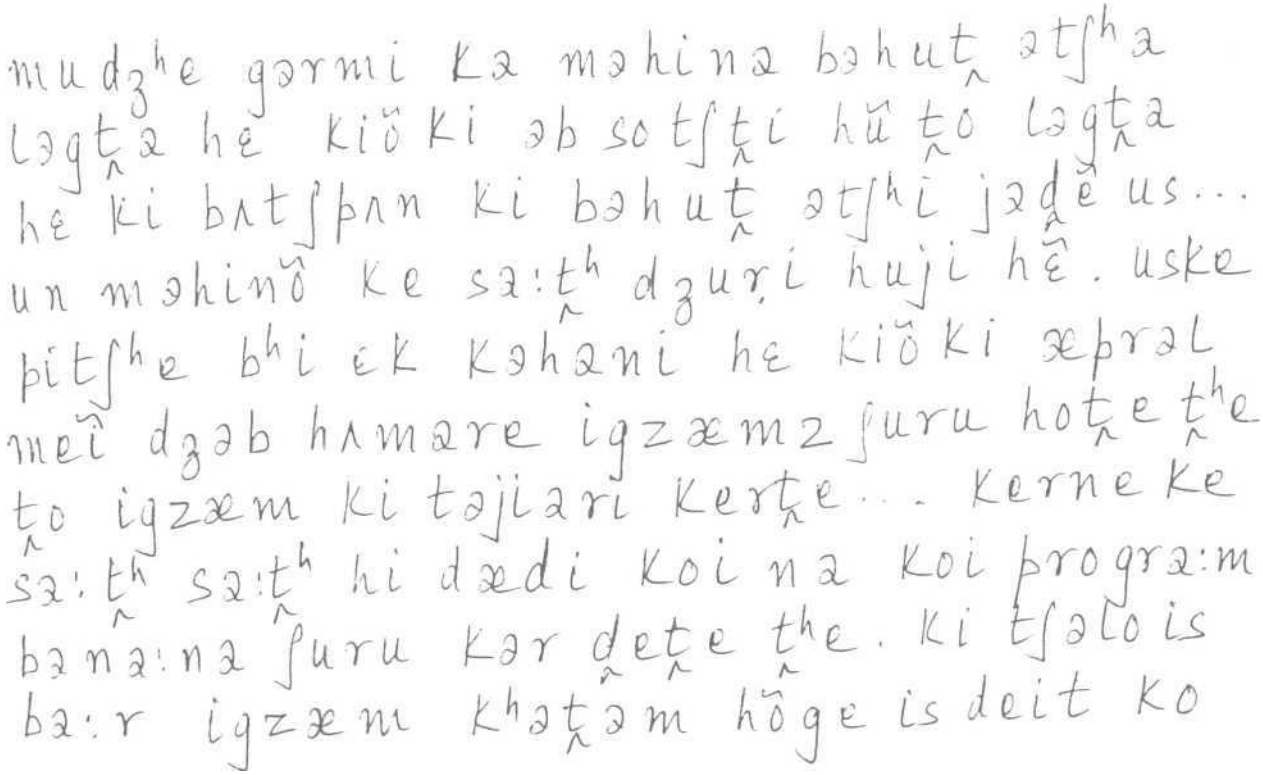
je ʈ̪isrə ɖ̪riʃe ek gəõ kə hɛ dʒəhə̃ pər log
ələg ələg kə:m kərʈ̪e huje ɖ̪ikʰəi ɖ̪ei
rəhe hɛ̃. kutʃʰ gʰər hɛ̃ ɔr gʰərõ ke pitʃʰe
kutʃʰ pəhə:ɾ̪ ɔr per ɖ̪ikʰəi ɖ̪ei rəhe hɛ̃.
ek ɔ:rəʈ̪ ʌpne gʰər ke sə:mne gəĩ kʰəɾ̪i
kərke usse ɖ̪uɖ̪ʰ ɖ̪ʰc rəhi hɛ. ɔr gəi
bʰusə tʃər rəhi hɛ. sə:tʰ meĩ hi ɔ:rəʈ̪
ne ek ɖ̪o ɖ̪uɖ̪ ke bʌrʈ̪ən bʰi rəkʰe
huje hɛ̃. ɖ̪usri ʈ̪ərəf ek ə̃:ɖ̪mi ɖ̪o bəlõ
ko lekər ke ə... lekər ke ʃə:jeɖ̪ kʰeʈ̪õ
ki ʈ̪ərəf dʒə rəhə hɛ. wəhĩ sə:tʰ meĩ
səɾ̪ək ke upər bi:tʃ meĩ ə... murgi ə̃
gʰum rəhi hɛ̃ ɖ̪ə:nə tʃug rəhi hɛ̃ gəĩ
ke bəgəl meĩ hi ek ə:ɖ̪mi buɾ̪ʰə ə:ɖ̪mi
ə... bəʈʰə hujə hɛni:tʃe ɔr wəhə̃ səɾ̪ək
pə kutʃʰ log sir pər əmʌtke rəkʰ kər
ke dʒə rəhe hɛ̃, ʃə:jeɖ̪ pə:ni bʰər
rəhe hɛ̃. ɖ̪o ʈ̪i:n log wəhĩ kone meĩ
kʰəɾ̪e huje hɛ̃.

Picture No. 3

This picture is of a village where people doing different types of work are seen. Some houses are there and on the back of the house, mountains and trees are seen. One lady with the cow in

front of her house is milking the cow and the cow is chewing dry grass. Nearby, the lady has kept two vessels of milk. On the other side, one man is taking two bullocks taking may be he is going towards the fields. There only, nearby, on the road, in the centre, hens are roaming about and they are pecking the seeds. Near the cow one man, an old man is sitting down. And there, on the road, some people with pitchers on their head, are going; may be, to fill water. Two or three people are standing there in the corner.

Discourse on any topic:



igzæm kʰəʈəm hõge ɔr uske bɑ:ɖ hʌm.
log jəhɑ̃ gʰumne dʒɑjẽge kəhɑ̃ gʰumne
ʧəlẽ ɔr je sʌb bɑ:ʈ ʧi:ʈ ʃuru ho dʒɑ:jɑ
kərʈi ʈʰi ʈo igzæm kɑ ɖʌr ʈo hoʈɑhi
ʈʰɑ, sɑ:tʰ sɑ:tʰ meĩ kʰuʃi hoʈi ɸʈʰi ki
igzæm kʰəʈʌm ho dʒɑjẽge ɔr hʌm log sʌb
gʰumne dʒɑjẽge ʈo hʌm logõ ko dʒʌb bʰi
bi:ʧ meĩ koi kʰɑli səme milʈɑ hɛ
pəhrɑi kɛ bɑ:ɖ, ʈo hʌm log jəhi sotʃʈɛ
rehʈɛ ʈʰe ki kəhɑ̃ dʒɑ:jẽ, kiʈne ɖin
rəhẽge, konsi dʒəgʰɑ dʒɑjẽge, sɑuʈʰ
meĩ dʒɑ:jẽ jɑ ʃimlɑ dʒɑ:jẽ ɔrsɑ:re
progrɑ:m bənne ʃuru ho dʒɑ:ʈɛ ʈʰe pər
ek gərmi ki ʧʰutijɑ̃ mudʒʰe həmeʃɑ
jɑ:ɖ rəhengi. un gərmi ki ʧʰutiõ meĩ
kiõ ki mʌmi skɑutz ɔr gɑidiŋ ki intʃɑ:rdʒ
ʈʰi ʈo unkɑ kæmp ləgɑ ʈʰɑ. unkɑ kæmp
ləgɑ ʃimlɑ kɛ pɑ:s hi ek ʧʰotɑ sɑ
gɑõ hɛ. ʈo hʌmne sotʃɑ ki mʌmi wəhɑ̃
dʒɑ rəhi hɛ̃ ʈo isi bəhɑne hʌm bʰi
ʃimlɑ ɔr ɑ:spɑ:s ki dʒəgʰɑ ɖekʰẽge.
ʈo hʌm logõ ne bʰi progrɑ:m bənɑ:jɑ
ki in gərmiõ ki ʧʰutiõ meĩ dʒʌb mʌmi

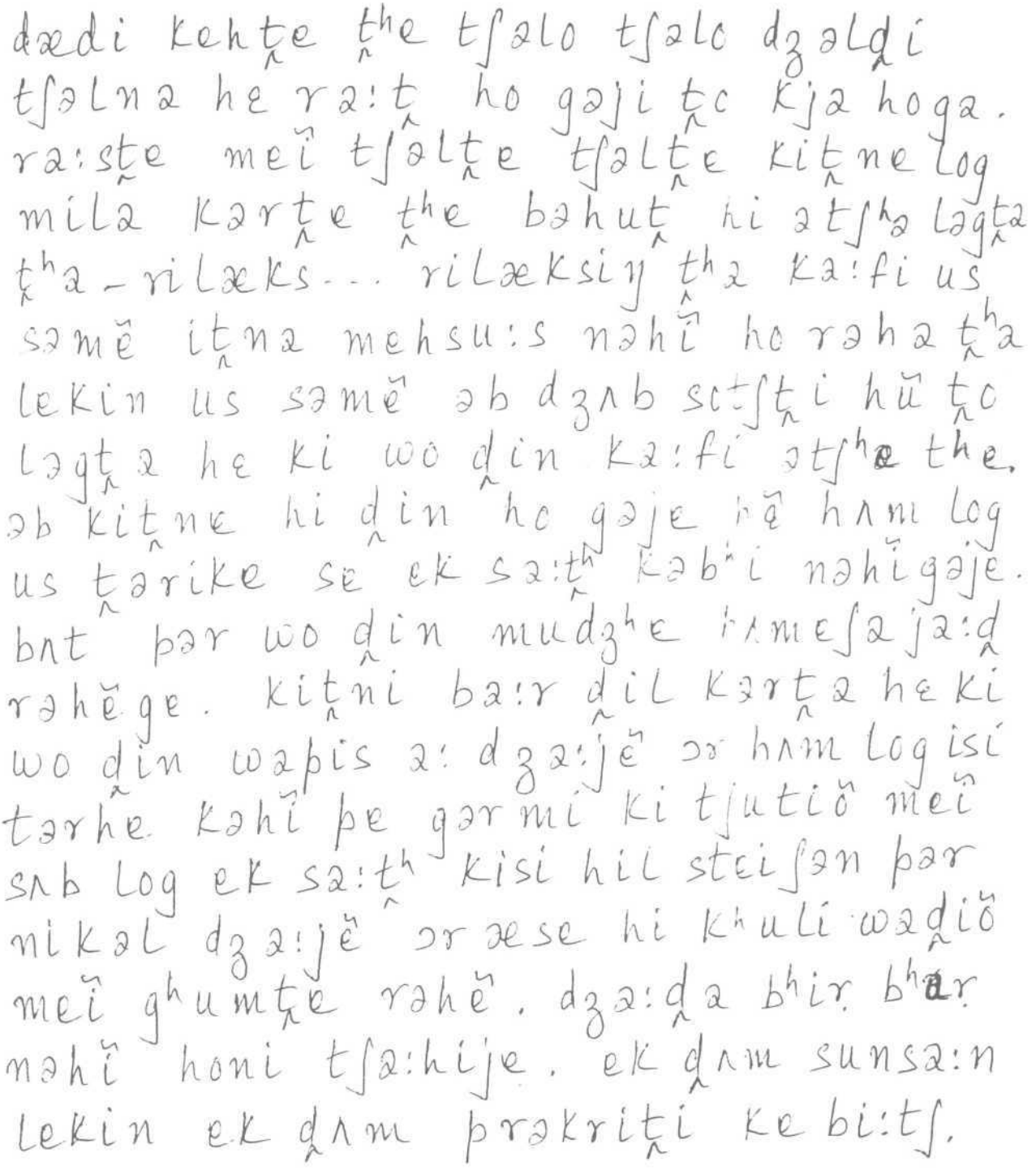
-?

ʌpne kors ke lije dʒəjẽ gi ʈʌb hʌm bʰi
ʃimla gʰumne dʒəjẽ ge ʈo hʌm logbʰi
ʃuru ho gəje. mʌmi ʈo hʌm se ɖo ʈin
ɖin pehle hi nikəl gəji ʈʰi ə.... ɔr
hʌm logõ ne kutʃʰ ɖer hʌm tʃəndigəṛ
ruke ɔr uske bə:ɖ ʈi n ɖin bə:ɖ
hʌmne ʃimla ke lije rə:ʈ ki bʌspəkṛi.
səfər ətʃʰə kʌt rəhə tʰə lekin mere
tʃʰote bʰai ko rəsʈe meĩ bəhuʈ dʒə:ɖə
ũtʃai ʈʰi ɔr uʈə:r gʰumə:v səṛkẽ ʈʰi.
uske ɖekʰ kər use ulti bʰi ə: gəi tʰi.
ʈo vo tʰoṛə sə bimə:r ho gəjə lekin
səfər ətʃʰə kʌt gəjə. mere ko ʈo bəhuʈ
ətʃʰə ɬləgʈə he nitʃe bəhuʈ və:ɖiõ
ko ɖekʰnə ɔr dʒiʈni dʒə:ɖə ũtʃai pe
hoʈe ʈʰe uʈnə dʒə:ɖə ni:tʃe ɖekʰne
meĩ ek ədʒi:b sə romãtʃ romãtʃ sə
hoʈə tʰə. bəhuʈ hi ətʃʰə logʈə tʰə.
ʈo sə:ri rə:ʈ mene ʈo rə:ʈ bʰər rə:ʈ
dʒə:g kər hi guzəri tʰi. fir hʌm log
ɖusre ɖin subʰe pəhũtʃe wəhã pər
ɔr ek hotel meĩ ruke. əb lekin kəbʰi
mʌmi se iʈne ɖer ʈək ɖu:r bʰi nəhĩ

rəhe t̪ʰe. t̪o mʌmi ki bʰi tʰoɽi jɑ:ɖ ɑ:
rəhi t̪ʰi. t̪o dɔdi bʰi hʌm logõ kɑ mu:d
tʰi:k kərne ki koʃiʃ kər rəhe t̪ʰe. t̪o
sʌbse ətʃʰɑ təri kɑ kjɑ hɛ hʌm logõ
kɑ mu:d tʰik kərne ke lije ki tʃəlo
kəl kəhɑ̃ kɑ progrɑ:m bənɑjẽ. hʌm log
sʌb restorent meĩ bɔtʰ kər ke kʰɑnɑ
kʰɑ rəhe t̪ʰe ɔr bənɑ rəhe t̪ʰe ki kəl
kəhɑ̃ dʒɑjẽge, mʌmi ko kis ɖin mil-
-ne dʒɑjẽge. t̪o ʃiml ɑ meĩ hʌm logõ
ne ɖo ɖin ghumɑ ɔr kufri ɔrɑ:spɑ:s
ki dʒəgʰə pər gəje. pər sʌbse ətʃʰit̪ʃi:z
t̪ʰi ki hʌm log dʒəhɑ̃ pe bʰi dʒɑ:t̪et̪ʰe,
pɔɖəl dʒɑ:t̪e t̪ʰe ɔr usmẽ bʰi is lije
kiõ ki dɔdi ne dʒʌb nɔkri kərni ʃuru
ki t̪ʰi t̪o wo himɑ:tʃəl meĩ sʌbse pehle
unhẽ nɔkri mili. t̪o wo kɑ:fi dʒɑ:nt̪e
t̪ʰe us dʒəgʰɑ meĩ ki kɔn se rɑ:st̪e
hot̪e hẽ, pəhəɽi rəst̪e ɔr kæse wəhɑ̃
pər dʒɑ:nɑ hɛ. t̪o ɔr bʰi dʒɑ:ɖ ɑ məʒɑ
ɑ:t̪ɑ t̪ʰɑ kiõ ki hʌm log ek ɖʌm gʰəne
dʒʌngl̃õ ke bi:tʃ meĩ se nikəl kər
dʒɑ:t̪e t̪ʰe fir t̪i:n ɖin ʃiml ɑ meĩ

rehne ke ba:d̪ hʌm log ne ek d̪in d̪ope-
-hər ko bʌs pəkṛi ʃiṭ̪la kheṭ̪ dʒa:ne
ke lije. je wəhi dʒəgʰə he dʒəhã̄ pər
mʌmi kə kors ləgə ṭ̪ʰə us dʒəgʰə pe-
ʃiṭ̪la kʰeṭ̪ ek tʃʰoṭə sə gəc̃ he kəri:b
d̪ʌs pənd̪rʰə gʰər hõge wəhã̄ pe ɔrje
gəidiy kə ek bəhuṭ̪ bəṛə əm ɔfis
ṭ̪ʰə wəhã̄ pe. wəhã̄ pe bəhuṭ̪ sə:re
tentz ləge huje ṭ̪ʰe ləik unkə pər-
-mənent ɔfis ṭ̪ʰə wəhã̄ pe gəidiykə.
wəhã̄ pe hər sə:l kəmp ləgṭ̪ə ṭ̪ʰe,
treiniy d̪ene ke lije gəidz ti:tʃər kə.
ṭ̪o mʌmi wəhã̄ pe ɔr bʰi d̪usre ti:tʃəz,
ələg ələg sku:lõ se bʰi ti:tʃəz ə:je
ṭ̪ʰe. unke sə:tʰ ruki huji ṭ̪ʰi ɔr kiõ-
-ki wo ek tʃʰoṭə sə gəõ ṭ̪ʰə, ṭ̪ohʌm
logȭ ko koi hotel wəgəerə rehne ke
lije ṭ̪ʰə nəhĩ̄ unke kəmp ke sə:mne
hi ṭ̪ʰoṛi d̪u:r pe ek d̪ukə:nṭ̪ʰi ek
tʃʰoṭə sə hotel ṭ̪ʰə ɔr hotel wəhĩ̄
ek pitʃʰe kʌmre meĩ̄ hotel wələ
rehṭ̪ə ṭ̪ʰə ɔr uske upər, us hotel ke
upər ek ɔr kʌmrə ṭ̪ʰə. ṭ̪o wodʒə:d̪ə:-

ʈer kəbʰi koi̯ gʰumʈe gʰumʈe a: dʒa:ʈa
ʈʰa . ʈo hotel wala unko upər wəhã̄
ʈʰehra ɖija kərʈa ʈʰa. ʈo mene kəha
ʧəlo ʈʰi:k he kiȭ ki hʌm bʰi wəhã̄
rehna ʧa:hʈe ʈʰe ɔr a:spa:s kidʒəgʰa
ɖekʰna ʧa:hʈe ʈʰe ʈo hʌm log bʰi
wəhã̄ ruk gaje hʌm log ʧarȭ wəhĩ̄
rehʈe ʈʰe upər ɔr kʰana wəhĩ̄ hotel
wale ke ɖuka:n meĩ̄ kʰaja kərʈe ʈʰe
ɔr hʌm logȭ ka ruti:n je ʈʰa ki roz
subʰe uʈʰna ɔr breikfa:st wəgərə
kərne ke ba:ɖ əpna kutʃʰ kʰa:ne ka
sama:n pɛk kərke, pa:ni ke kutʃʰ
bɔtəlz, wəgərə bʰər kər hʌm log
a:spa:s dʒʌngəl meĩ̄ nikal dʒa:ʈe
ʈʰe treking kərne ke lije. bəhuʈ hi
əʧʰa ləgʈa ʈʰa. us samẽ̄ ʈo laik gʰəne
dʒʌngl̃ȭ se dʒa:na ɔr dædi hʌmẽ̄
dəraija kərʈe ʈʰe ki əbʰi jəhã̄ se
koi ʃer a:jega, ɔr jəhã̄ pe ʌndʰera
ho gəja ɔr ʈum log kothehrna pəṛega
jəhã̄ pe ra:ʈ ko ʈo dʒəldi ʧəlo.
bi:ʧ meĩ̄ dʒʌb ʈʰʌk dʒa:ʈe ʈʰe ʈo



I like the month of summer a lot because ... now when I think, I feel as if good memories of my childhood are associated with those months. There is a story behind that also because in April, when our exams used to start, along with the preparation only, Daddy used to start making a program. Come, this time,

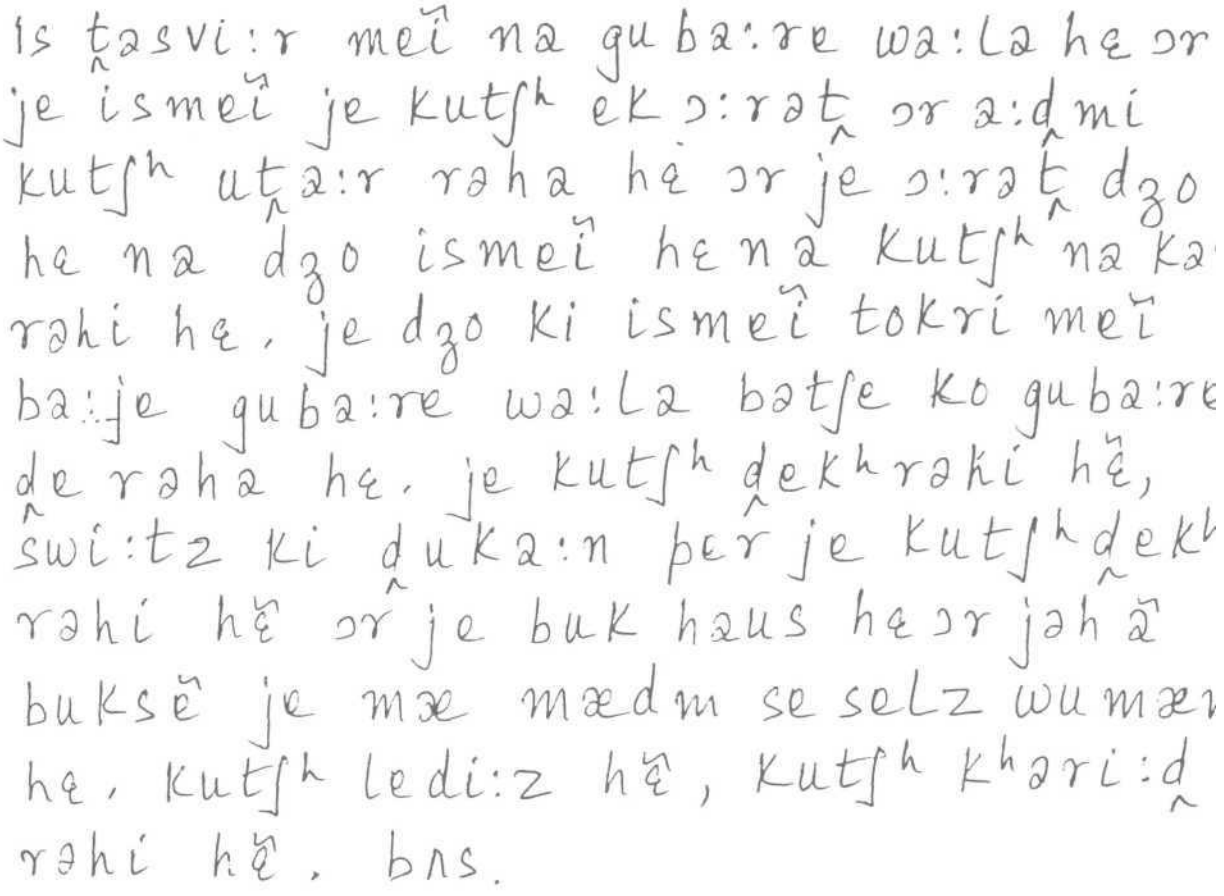
exams will finish, on this date, and then we will go somewhere,where should we go, and all such talk used to start. There used to be a fear of exams but also the happiness that as soon as the exams finish, we will go to visit some places. And whenever we used to find leisure time after studying, then we used to think about this only - that where we will go, how many days we will stay, what all places we will visit - in south or we'll go to Shimla and all the programs used to start but one particular summer vacation I will always remember. In those summer holidays, because mummy was a Scouts and Guiding in charge, so a camp was held. Their camp was held in a small place near Shimla. So we thought that Mummy is going there, this way we will also visit Shimla and the nearby places. So we also made a program that when Mummy goes for her course, we will also go to Shimla. We also started. Mummy had left two-three days earlier only and we stopped at Chandigarh. And after three days, we took a bus for Shimla at night. The journey was good but my younger brother was feeling nauseated because of the height and the curves. He vomited also and he fell sick. But the journey was good. I like to watch the valleys down a lot. The higher it is, the more exciting it is to watch the deep valleys. I was awake the whole night. Then, on the second day, we reached in the morning and we stayed in a hotel. But we had never stayed without Mummy for so long. So we were missing her. So Daddy was trying to lighten our mood and the best way to improve our mood is to make the next day's program. We were all sitting and eating in the restaurant and were making program - where we will go, when we

will meet Mummy ? So we roamed for.two days in Shimla and saw Kufri and nearby places. But the best thing was wherever we went, we went on foot. And that also because when Daddy started working, he got in Himachal initially. So he knew a lot about that place - what ways are there, hilly ways and how to go there. So it was even more enjoyable as we used to go through deep jungles. Then, after staying in Shimla for three days, one afternoon, we took a bus to go to Sheetla Khet. This is the same place where Mummy's course was being held. Sheetla Khet is a small village where approximately 10 - 15 houses are there. And there is a big guiding office there. There were a number of tents and they had a permanent guiding office there. Over there, every year, camps used to be held to train for a guide teacher. So Mummy was staying with other teachers who had come from different schools.And because it was a small village, so we did not have any hotel etc to stay. In front of their camp,at a short distance, there was a shop, a small hotel and the hotel owner used ot stay there only in a room at the back and on top of the hotel, there was one more room. Mostly, when some people used to come for a visit, he used to make them stay on top. So we thought it was okay as we also wanted to stay there and see nearby places. So we also stayed there. We four, used to stay on top and we used to have our meals in that hotel only. Our routine was to get up in the morning and have our breakfast. Then, after packing some things to eat and filling some water bottles, we used to go to the nearby jungle for trekking. It used to feel very good. That time, like, going through deep forest, and daddy used to scare us - now, from here, a lion will come and here it is dark;

walk fast or you will have to stay here at night. In between when we used to get tired, he used to say, "Malk fast, what will you do if it becomes dark?" We used to meet a lot of people on the way and it used to be nice . . . it was quite relaxing. That time, we didn't realize it so much but now when I think of it, I feel as if those days were very nice. Now, how many days have passed but we haven't gone together like that time. But I will always remember those days. How many times I wish I could have those days back and we would go, like this, somewhere, together, during our summer vacation, to a hill station. And like this, we keep roaming in the valleys. Too much crowd should not be there. It should be absolute silence but with nature.

Case No. 1

Picture No. 1



In this picture, no, there is a balloon seller. And he, in this, he something, one man and woman is removing something and this woman who is there, no, the one who is there in this no, is doing something. This one in this, in this basket, ba this balloon seller is giving a balloon to the child.They are seeing something, at the sweets shop, they are seeing something and this is a bookhouse and here books, this m . . . . madam is a saleswoman. Some ladies are buying something. That's all.

Picture No. 2

is meĩ pi ti ho rəhi hɛ ɔr ti: tʃə2 jəhã:
blæk bord pə kutʃʰ kərə rəhə hɛ.
blæk bord pe, stjudent bæṭʰehẽ. ek
stjudent kutʃʰ buk kʰoL kər kutʃʰ
pər rəhə hɛ. je Lər ki jəhã: pe kʰər i
hɛ ɔr wo bətʃe fut bɔL kʰeL rəhe hɛ̃.

In this they are doing P.T. and here, teacher is making them do something on the black-board, on the black-board. Students are sitting. One student, after opening some book is reading something. This girl is standing here and those children are playing football.

Picture No. 3

is meĩ gəĩ..... je ɔ:rət^ dʒo hɛ gəĩ
kə d^ud^ʰ nikə:L rəhi hɛ. je sə:t^ʰ meĩ
dʒo bʌrt^ən rəkʰə hɛ ɔr ə:d^mi hʌL je
d^o bæLẽ hɛ̃. je hʌL tʃəLə rəhə hɛ.
je murge ko d^ə:nə, je ə:d^mi dʒo hɛ
murge ko d^ə:nə də:L rəhə hɛ. bʌs
gəũ hɛ, dʒʰõ pri wəgærə hɛ.

In this, ... cow... this woman who is there is milking the cow. This vessel which is lying with it. And man plough. These are two bullocks. He is ploughing. He, to the cock, this man who

is there, is feeding seeds to the cock. There is a village, that's all. Huts etc. are there.

Analysis:

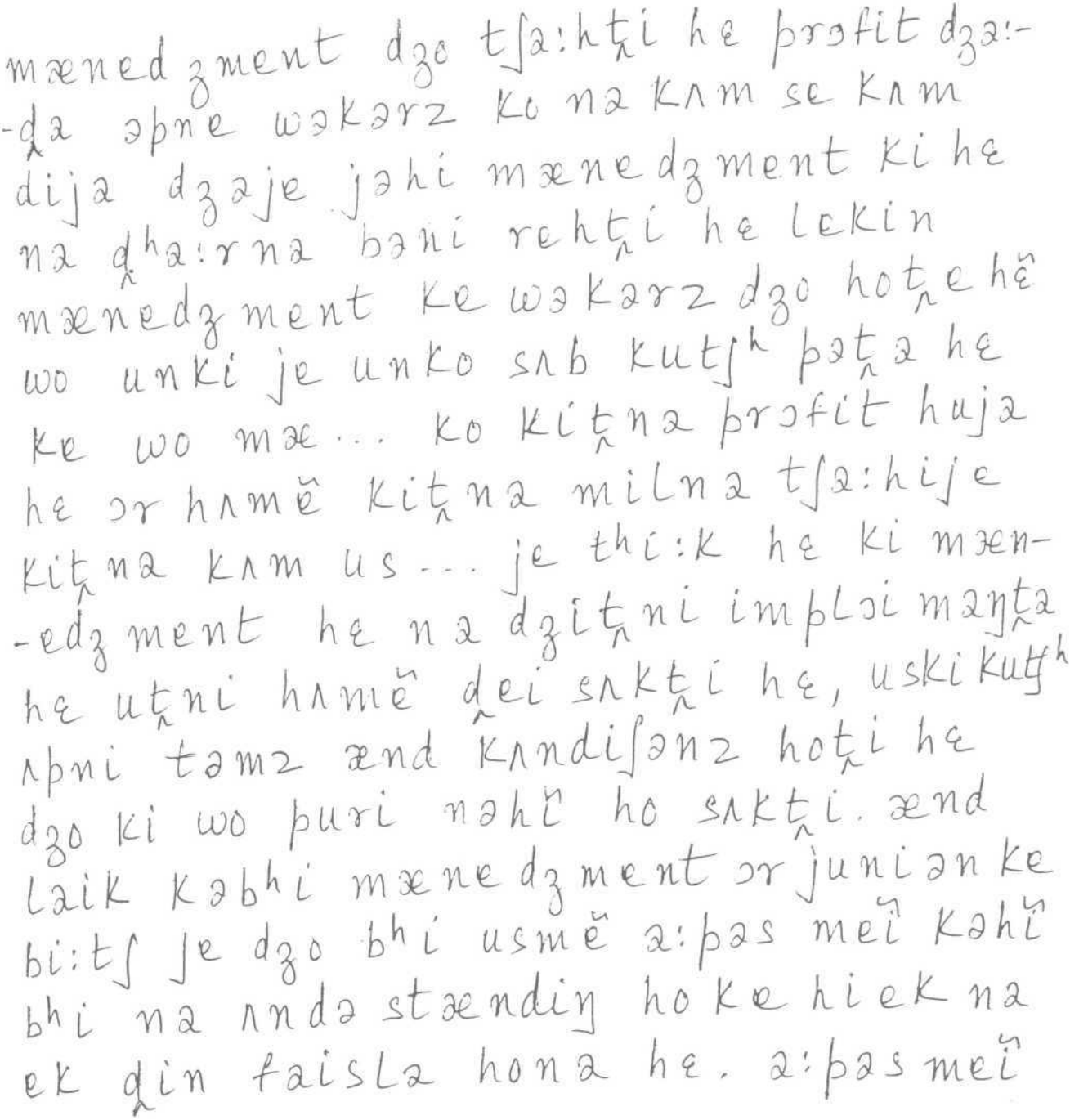
The analysis of this particular case's discourse indicates that the case has merely pointed out the components of the picture.

On comparison with the normal speech sample, it basically lacks the story format. Use of words like no' and phrases like 'the one who is' which are not needed are present. There is unnecessary repetition of sentences e.g. They are seeing something; at the sweets shop, they are seeing something. This gives an impression of stereotypic empty speech with Lack of content and also verbosity. Extra syllables like ba, ma etc are present indicating word retrieval difficulty. The discourse contains incomplete sentences. The case starts with one sentence but stops in between and starts with another. This is more evident in picture number 3. This indicates lack of intrasentential cohesion. Overall, also there is a lack of cohesion. There is no continuity of reference. None of the other types of cohesion (substitution, ellipsis, conjunction, lexical) have been observed either. One of the prominent findings is the presence of incomplete cohesive ties e.g. They are seeing something.

Code mixing is seen e.g. wrong use of plural (bukse) and wrong verb used (iz). The discourse also contains a number of pauses.

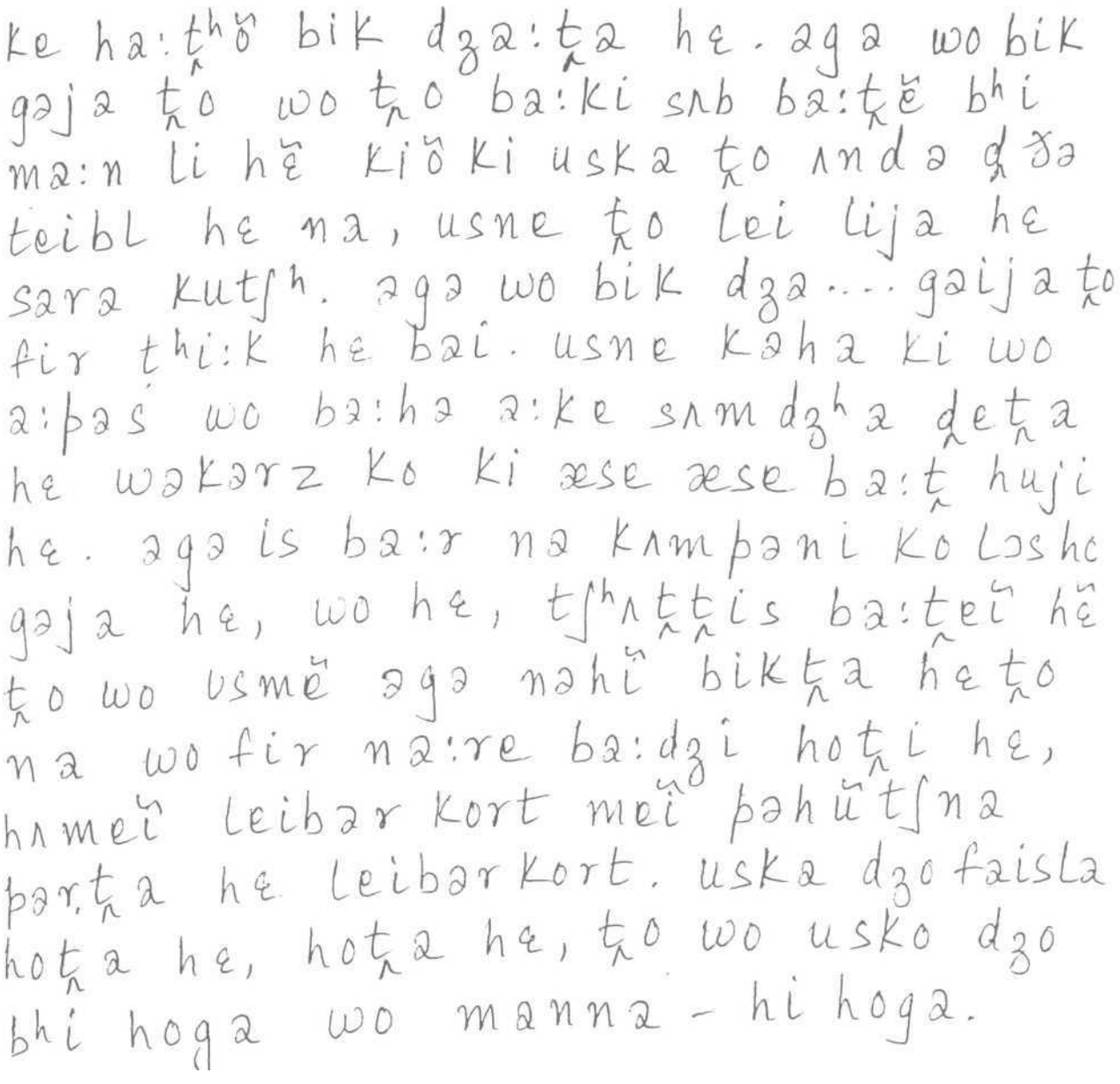
Overall, the discourse is lacking in intonation and substance.

Discourse on any topic:



bæt̪ʰ kər , ba:t̪ʌ tʃi:t̪ʌ ke d̪ʌra:n t̪ʌəbʰi kutʃʰ pei skeil rivæljueiʃən ki ba:t̪ʌ hot̪ʌi hɛ. t̪ʌəbʰi implɔi kutʃʰ ma:ɳt̪ʌə hɛ, mænedʒment kutʃʰ d̪ʌenɛ kelije təjlər hot̪ʌi hɛ. t̪ʌo uske ba:d̪ʌ na:re ba:dʒi bʰi hot̪ʌi hɛ. na:re ba:dʒi bʰi ka:fi hot̪ʌi hɛ ɔr je d̪ʌusre əpne əm...ə... implɔi ʌpni dima:nd rəkʰt̪ʌə hɛ-bai hʌmɛ̃ je bonʌs tʃa:hije , jə it̪ʌnə hʌmɛ̃ pei skeil d̪ʌeĩ , it̪ʌnə-ædite iʃən tʃa:hije, it̪ʌnə medikʌltʃa:hije, it̪ʌni ɔrnəd li:v tʃa:hije, je bonʌs hʌmɛ̃ tʃa:-hije ɔr je it̪ʌ... prodʌkʃən bonʌs əlag se dima:nd kərnə tʃa:ht̪ʌə hɛ.

upai dʒo hɛ nə wo ækt̪ʃuəli mænedʒment ke ha:t̪ʌʰ meĩ hot̪ʌə hɛ. ækt̪ʃuəli junion kə prezident-junion kə dʒo li:də hɛ uske a:pas meĩ əm... bæt̪ʰ kər mænedʒment ko bole nə ki .... wo a:pas meĩ bæt̪ʰ kə səmdʒhot̪ʌə kərnə pərt̪ʌə hɛ kiõ ki junion dʒo hɛ d junion kə dʒo li:də hɛ wo a:pas meĩ t̪ʌo bik dʒa:jegə. mænedʒment



What management wants is maximum profit, to give the least to the workers, this stays as the policy of the management. But the workers of management who are there, they there they know everything that mae... has profited how much and how much ve should get, how less that. This is right that management is there no, how much the employee asks, that much it can give us. It has its own terms and conditions which can't be fulfilled. And like sometimes between the management and the union, this

whatever, in that no among them whenever no, after understanding only one or the other day a decision has to be reached. After sitting together, during the talk only, some pay scale reevaluation talk takes place. Only then the employee asks for something, management agrees to give something. Only after that, processions and slogans also take place. A no. of slogans are said and these others, their um.... the employee demands that we want this bonus or we want this much pay scale, want this much aditation, this much medical, want this much earned leave, this bonus we want and it wants to demand production bonus separately.

The solution that is, no, that is actually in the hands of the management. Actually union's who president is union's who leader is, his talk among m.... after sitting, tell the management, no, that he has to sit among them and reach a compromise because the union which is there, union's leader who is there he will be bribed among them, will get sold at the hands of the management. If he gets sold, then, he , then, rest of the terms will be agreed to because his is under the table, he has taken everything. If he has been bribed, then he will say... it's alright, that he, among, he will come out and tell the other workers that they have talked like this. If this time no, company has undergone a loss, that is there, thirty six things are there. In this, if he doesn't get bribed, he, then slogans are said. We have to go to labour court, in the labour court. Whatever it's decision, is there, then it has to agree to whatever it is.

Analysis:

In this sample, we can see the use of complex sentences with clauses(e.g. 'if', but', 'because', 'then' etc.) but they are syntactically wrong. One can imagine what the case wants to say but the sentence formulation is syntactically incorrect. There was lack of initiation when he was asked to talk on some topic. Use of wrong pronoun is seen e.g. h me instead of unhe and h me for use. Nominal instead of acquisitive pronouns are used e.g. wo ɑ: pə s meĩ..... bəeṭʰ kə sʌmdʒʰoṭ a..... In the same sentence we can see conjugation i.e., the use of wrong form of verb. Mixing of future and past tense is seen e.g. əgə is bɑ:r nɑ kʌmpəni ko lɔs ho gəjɑ hɛ. Extraposition is seen e.g to fir tʰi:khɛ, usne kəhɑ. Attempts to self correct are made e.g. wo unki --> je unko. There are no anaphoric references. Overall, it is a verbose and disjointed discourse May be, we can classify it under impoverished' discourse given by Hartley and Jensen in 1985.

Case No. 5

Picture No. 1

ʈ̪əsvi:r meĩ lərki hɛ, lərkə hɛ ɔr ek
beʈə bʰi hɛ inke ɔr ek sunḍ̪ri hɛ.
kutʃʰ foto hɛ̃, foto hɛ̃, lərki hɛ,
lərkə hɛ, ɔr bəʈʃe hɛ̃, bəʈʃe hɛ̃
ɔr bukhəus hɛ. bukhəus hɛ ɔr....
wo sʌb piʈʃə hɛ̃.

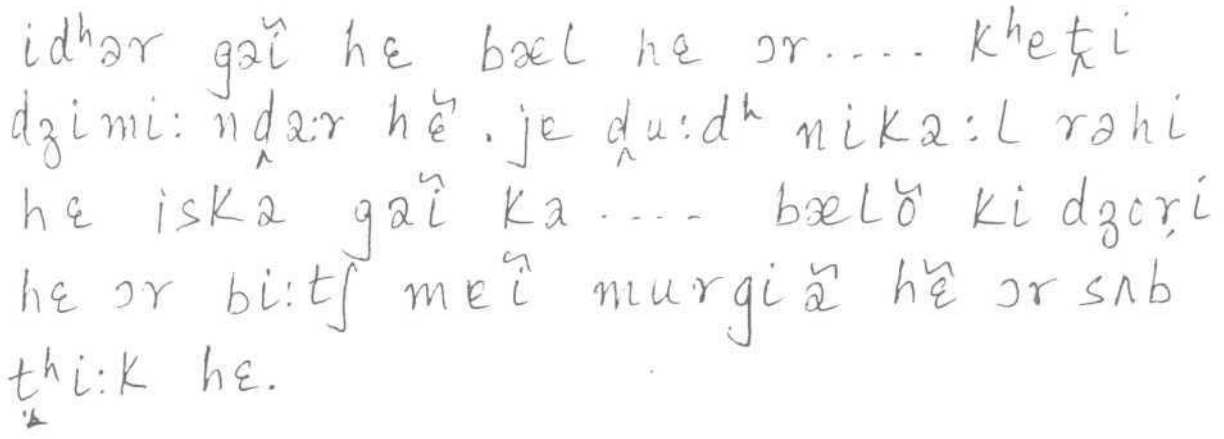
In the picture, there is a girl, there is a boy and there is a son, they have and one pretty girl is there. Some photographs are there, photographs are there, girl is there, boys are there and children are there, children are there and there is a bookhouse, bookhouse is there and .... all those are pictures.

Picture.No. 2

je bəʈʃe eksəsəiz kər rəhe hɛ̃. bəʈʃe
eksəsəiz kərrəhe hɛ̃ ɔr kutʃʰ uḍ̪ʰər
ḍ̪ər rəhe hɛ̃ ɔr bɔl kʰel rəhe hɛ̃.
bəʈʃe ʈʃʰote hɛ̃, bəṛe hɛ̃ ɔr unko
si kʰa:ne wə:le je hɛ̃ ɔr.....
məstə bʰi hɛ̃.

These children are doing exercise. Children are exercising and over there,some are running and playing ball. Children are small, are big and to teach them, he is there and_____teacher is also there.

Picture No. 3



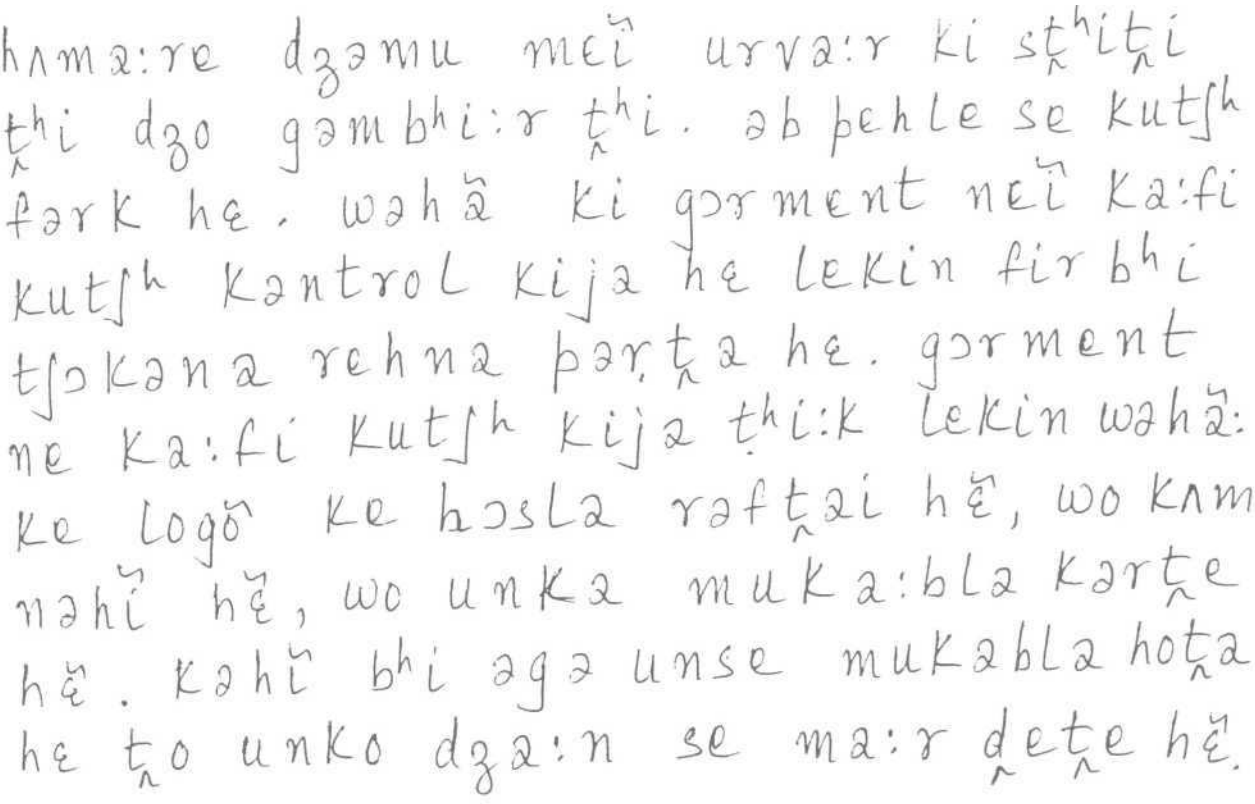
Here, cow is there, bullock is there and . . . . . farming, Zamindar is there. She is milking the cow. Hers, cows'. . . . there is a pair of bullocks and in the middle, hens are there and everything is fine.

Interpretation:

In this case, the discourse is basically limited and lacking in information. Again, it is pointing to the things and the people in the picture. Average length is 3 -4 word sentences. There is no description of action e.g. hens are there (picture

no.3). There are a number of pauses and hesitations indicating word retrieval and sentence formulating problems e.g. iskə, gəĩ kə ... (Picture no.3). Unnecessary repetition of sentences is there. Every new sentence is preceded by a repetition of the previous sentence e.g. Some photographs are there. Picture no.2. discourse consists of one line statements on three sub-sections. Overall, there is lack of cohesion (both inter-intra-sentential) and there are lack of anaphoric references.

Discourse on any topic:



æsi koi ba:ʈ nəhĩ hɛ gʰəbra:ne kiɔr
wəhã: ki gɔrment bʰi kəra: strɔŋə
ækʃən le rəhi hɛ. ba:ki wəhã: ki
dʒo ka:bliəʈ hɛ wo bʰi gɔrment ka
sa:tʰ kʌm nəhĩ ɖete. unke sa:ʈʰ
sa:ʈʰ bəkaiɖa hʌm sa:ʈʰ rehʈe hɛ̃.
kəhĩ bʰi koi urva:l kə pəʈa tʃəlʈa
hɛ ʈo ek ɖʌm suraŋ ɖeʈe hɛ̃. ɔr
wəhã: dʒa:kə uspa hʌmlə kərʈe
hɛ̃ ɔr ma:r gira:ʈe hɛ̃ kiũ ki
hʌma:re pakisʈa:n ki baundri ke
lain nəzɖi:k hɛ. mæ̃ kʰuɖ a:ʈʰmi:l
ke ʌnɖə rehʈə hũ pəkisʈa:n ki
baundri ke, lekin hʌm ɖin ra:ʈ
tʃəkənə rehʈe hɛ̃. bəhuʈ ko pəkrʈe
hɛ̃ unko ɔr unko ma:r gira:ʈe hɛ̃.
hʌm tʃʰorʈe nəhĩ hɛ̃ unko. ja:ni ki
hʌmẽ pura gɔrment ke upər nirbʰər
nəhĩ hɛ̃. hʌm əksə us meĩ hɛ̃ us
eriə meĩ hʌmeĩ ə:ɖm se hʌma:re
hʌm uski wədʒhə se unke sa:ʈʰ
pura mukəbla kərʈe hɛ̃. je ʈʰə.

In our Jammu, there was a state of turmoil which was tense. Now, it is, better than before. That place government has controlled a lot but still we have to be cautious. Government has done a lot right but that place people's have got guts, they are not any less, they fight them. Anywhere, if there is a fight with them, then they kill them. There is no need to worry and that place government is also taking a strong action. Rest, that place strength also supports that government in no less way. Along with them, we also support them. Whereever we come to know of an enemy, then we give all clue immediately,and after going there, we attack him and kill him. Because our Pakistan boundary line is nearby, I myself, stay within eight miles of the Pakistan boundary, but we remain cautious day and night. We catch a number of them and kill them. We don't leave them. That is, we are not fully dependent upon the government. We are mostly in that, in that area. We,_____is standing near us. Due to this, we give them a good fight. This was.

Interpretation:

Here again, though the discourse consists of complex sentences, it is not correct grammatically. Due to the lack of intrasentential cohesion and incomplete sentences it gives an impression of verbosity, empty speech and lack of content, e.g. US eriə meĩ hʌmẽ a:d̪m se hʌma:rehʌm uski wəd͡ʒʰə se unke.....

Though the latter part of the sentence makes sense, but there is no connection between the first part and the second

part. Word order is reversed e.g. Kitʰ i:K/tʰi:K Kijɑ. In a few sentences, there is wrong word usage e.g. a:dm in the last sentence , surag/surag, kɑ:bliət in /bɑ:ki wəhɑ: Ki dʒo Kɑ:bliət hɛ.../. Here, we can understand the meaning but a wrong word is used. There are incomplete cohesive ties e.g. Kiɔki hʌmɑ:re pɑ:Kistɑ:n bɑundri nədʒik ha. The case has given a reason and made a syntactically correct sentence but hasn't specified what the reason is for. Moreover, there are no anaphoric references.

Though there is one topic, there is no link between different parts of the discourse. When compared to case no.l, the discourse quality seems to match the LPT score.

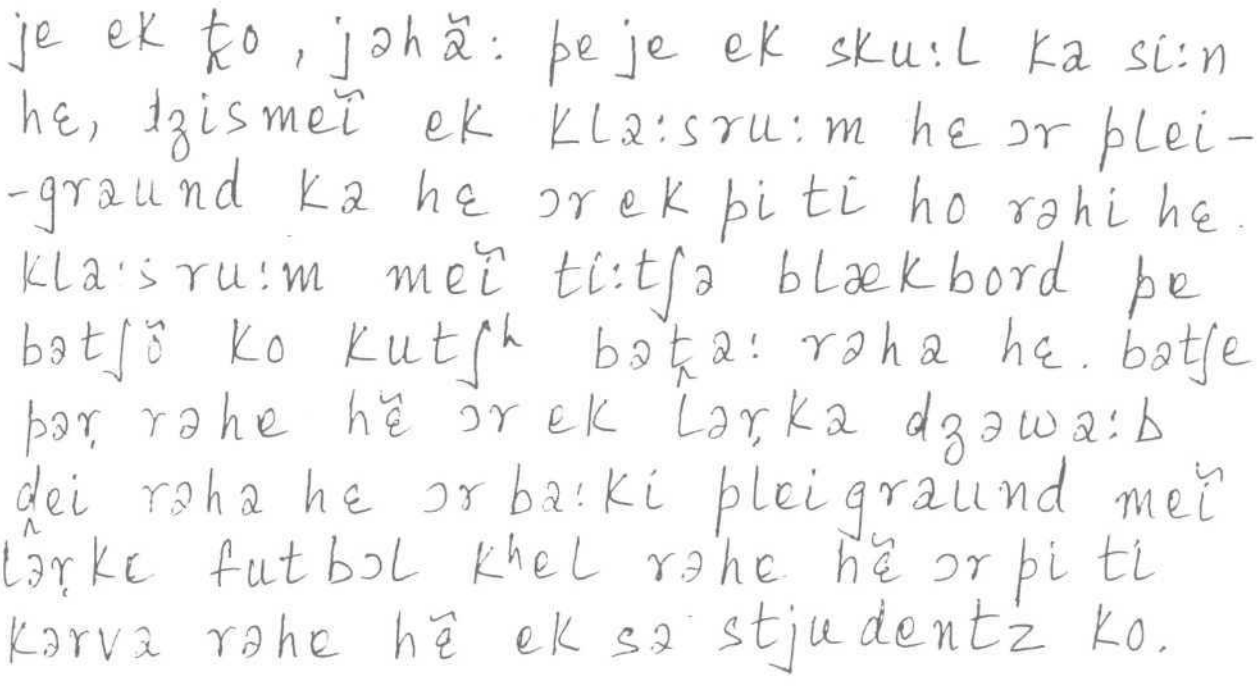
Case No. 6

Picture No. 1

ismeĩ ek bukhaushɛ. ismeĩ ek leidi kiʈ̚a:b lene ai hɛ ɔr wəhã̄ pe seilz boi hɛ unkə ɔr wəhã̄: pe ka:fi̤ kiʈ̚a:bɛ̃̄ hɛ̃̄ ɔr buk haus ɔr wəhã̄:pe ɔr bʰi ɖuka:nɛ̃̄ hɛ̃̄. ɔr usmeĩ ek ɖuka:n meĩ ek leidi ʌpni lər̥ki ke sa:tʰ ai hɛ kutʃʰ kʰəriɖne. ɔr wəhã̄: pe əm.... guba:re wa:lə bʰi dʒə rəhə hɛ, dʒisse ek bətʃe ne guba:rə lijə hɛ. ek leidi hɛ dʒo ʌpni tokri meĩ samə:n da:l rəhi hɛ. ek a:ɖmi kutʃʰ bənə: rəhə hɛ.

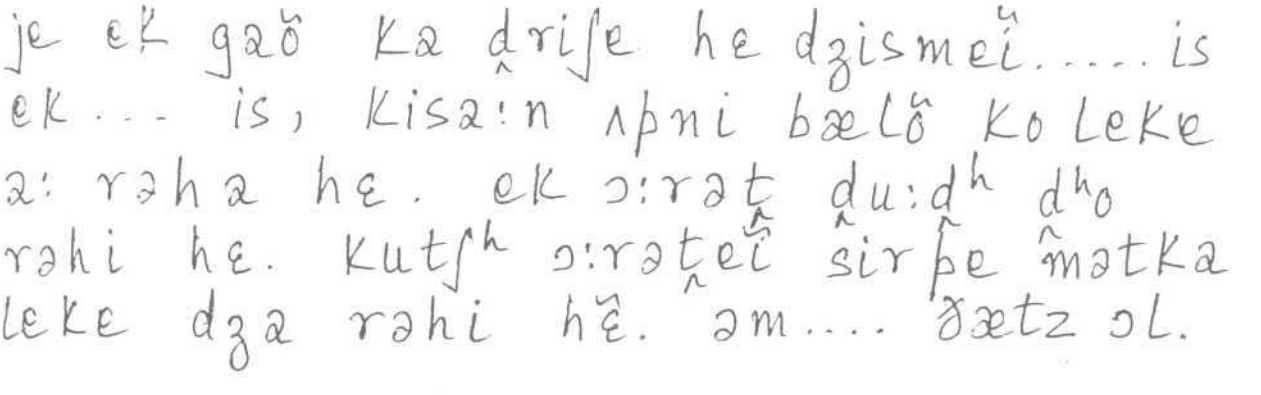
In this, there is a bookhouse. A lady has come to take a book and there is their sales boy. And there are a number of books there and in the bookhouse and there are more shops also. And in those, in one shop, one lady has come with her daughter to buy something. And these m...one balloon seller is also going, from whom one child has taken a balloon. One lady is there who is putting something in her basket. One man is making something.

Picture No. 2



This one here, this is a school scene, in which there is one classroom and a playground And one, P.T. is being done. In the classroom, teacher is teaching the children something on the black - board. Children are studying and one boy is answering a question. And the rest of the boys are playing football in the play - ground . And one Sir is making the students do P.T.

Picture no. 3



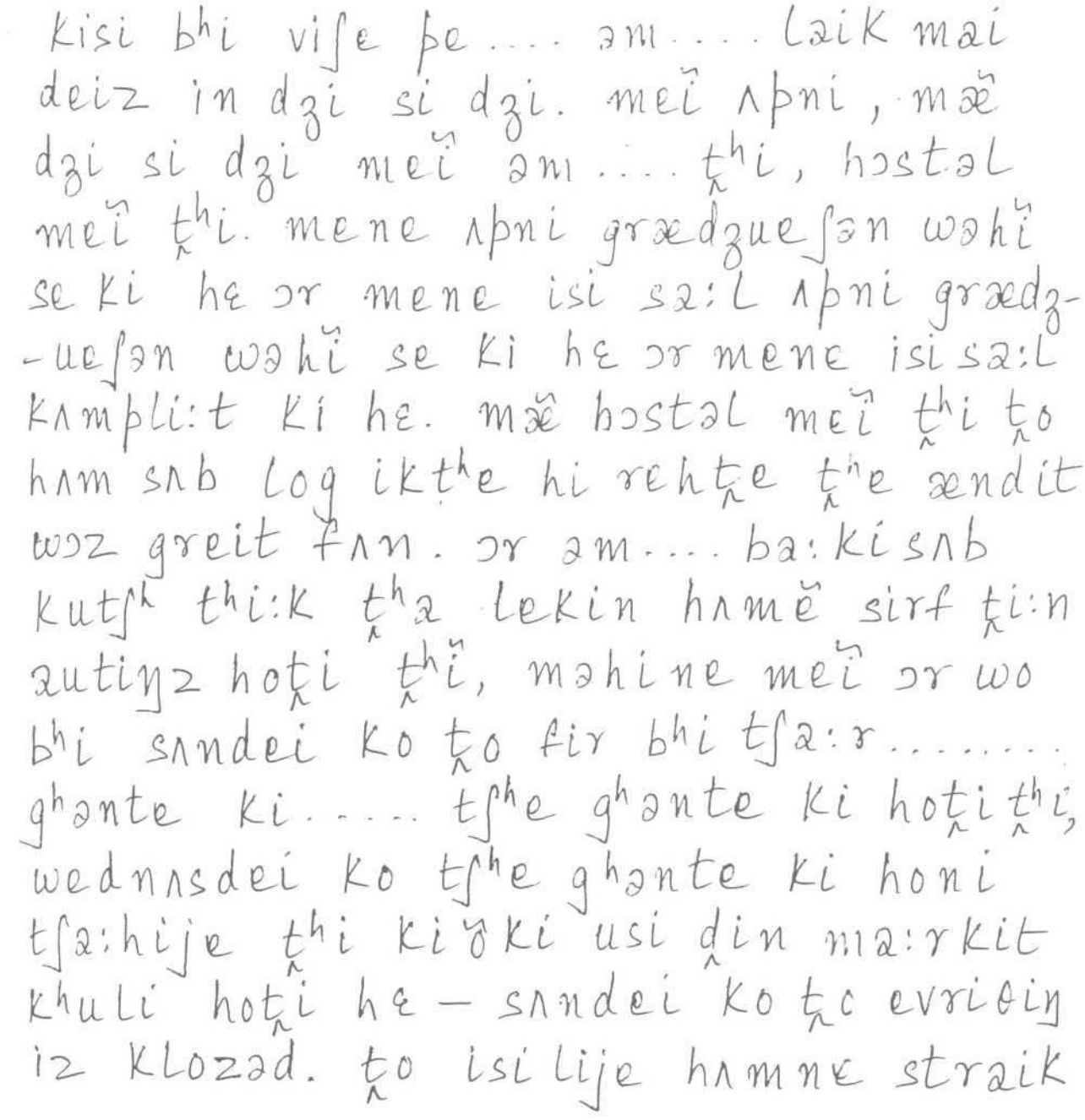
This is a village scene in which . . . . this one... this, a farmer is coming with his bullocks. A woman is milking the cow. Some ladies are going with pots on their head, m ... that's all. And one man is sitting . Two cocks . . . . . they are eating seeds.

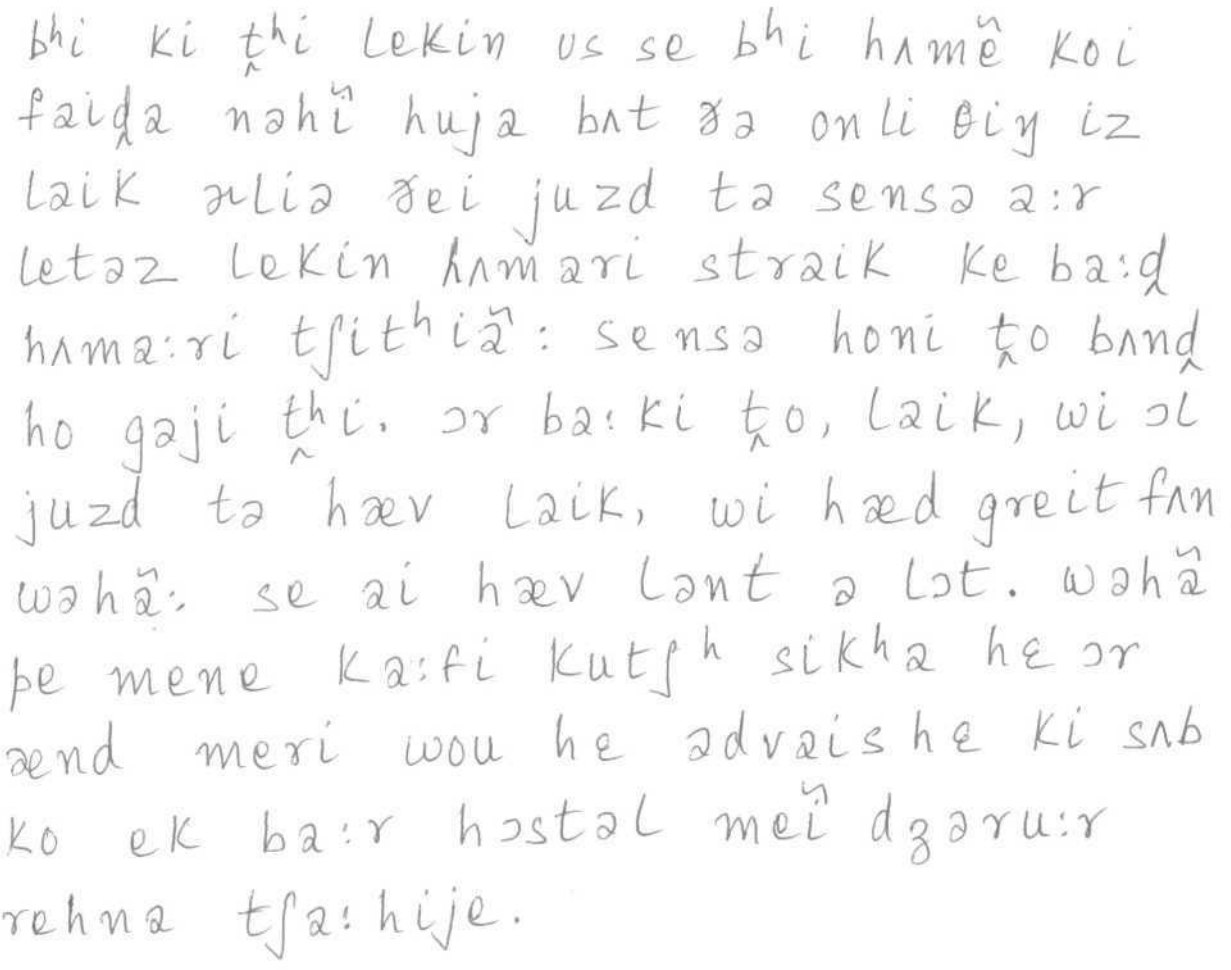
Interpretation:

When compared with the other head-injured cases, this sample is much better.Although,when compared with the normal speech sample, it lacks in creativity. The main thing to be noted here is that this sample has a story format, has anaphoric references (e.g.this is a school scene). More over, it does not contain any incomplete cohesive ties. The case gives a good description of the picture, telling what each and every person is doing in the picture. Sentences are also well formulated and are syntactically correct. However, there is an excessive repetition of the conjunction and'.A few unnecessary phrases like *is ek . . . is'(in picture 3) and plei gr&und kaJ h£ are present. Word order reversal is seen in the last sentence of picture 2 i.e. 3r pi ti kgrv^ rghe h^ ek S3 stjudentz ko. Sentences like ek piti are illogical.Inspite of these mistakes, use of clauses is evident e.g. One balloon seller is also going from whom one child has taken a balloon. Pronominal cohesion is observed (e.g.his' 'their' etc.in picture 3).

Ellipsis type of cohesion is also present e.g. Two hens ___ they are eating). This sample is the best among all the other cases and is the most refined.

Discourse on any topic:





On any topic ... um ... like my days in G.C.G. I, mine, I was in G.C.G., in the hostel. I have done my graduation from there and I've completed my graduation this year only. I was in the hotel, so we all used to stay together and it was great fun. And um . . . rest all was fine but we had only three outings in a month and that also, an Sunday, we still had for four . . . . hours... six hours, on Wednesday, we had only for four hours though on. Wednesday, we should have it for six hours because that day the market is open on Sunday, everything is closed. So, for this, we did a strike also but by that also we did not benefit. But the only thing is, like, earlier, they used to censor our letters but after our strike, our letters stopped

getting censored. And rest, like we used to have, like we had great fun. I've learnt a lot from there, I learnt a lot there. And, and, my that is, my advice is that everyone should stay in the hostel atleast once in a lifetime.

Interpretation:

This sample consists of a number of complex sentences and also clauses with the use of words like "so, also, then,because, though" etc. Event is located both in time and space. Anaphoric references like starting with an introduction and ending with an advice are present. Self correction instances are seen e.g. mei pni, mei d i si d i mei ... four.... six hours etc. The case tries to be more specific e.g. m e d i sid i mei oi, h st 1 mei oi. This sample is a good example of both intra-and inter-sentential cohesion e.g.

a) Conjunction cohesion - Temporal type - When I was in the hostel, then . . . . . .

b) Adversative cohesion (Conjunction type)
   - But we had only three outings.

c) Conjunction cohesion - causal type - So for this, we did a strike.

The average length was 7-10 words per sentence. However, in the last sentence, we can see a word retrieval problem e.g. My that is, my advice is that.... Also, the last but three lines give an impression of lack of content.

Conclusion:

We can see that the discourse quality correlates pretty well with the LPT score. The problems in all these cases range from lack of content, stereotypic utterances to well formulated sentences but with word retrieval problems and lack of cohesion. Overall, we can describe a HI discourse as a verbose, disjointed discourse with lack of content. These findings force us to realize that the 'discourse analysis is a very good indicator of the language problems experienced by the cases with head-injury. Measures to make it an essential part of testing need to be taken.

DISCUSSION

Our results indicate that, overall, the language problems exhibited by the head injured patients lie somewhere on the continuum between the Anomic aphasics and normals, though, the tilt is more towards the anomics.

The results of the present study are in agreement with a number of studies which have been reviewed earlier. Our findings in agreement with others are :

a) All of the patients conserved the repetitive and imitative levels of language (Novoa and Ardila, 1987).

b) Language characteristics of the HI given by ASHA in 1988:
- Disorganized, wandering discourse, including conversational and monologic discourse;
- imprecise language and word retrieval difficulties;
- hyperverbosity, restricted output, lack of initiation, and
- difficulty detecting main ideas.

c) Predominance of anomia (Heilman et al, 1971; Penn and Cleary, 1988).

d) The most frequent conversational errors included linguistic nonfluency, revision behaviors and inability to structure discourse (Parsons et al, 1989). This led to an impression of verbosity.

e) Performance on the word fluency task did not significantly relate to confrontation naming skills(Lohman et al, 1989)

f) HI subjects used different cohesion patterns from the normal adults. The CHI subjects used fewer cohesive ties than the normal subjects and they used different proportions of referential, elliptical, conjunction and lexical ties. Thus, they evidenced reduced ability to establish the intersentential semantic relations that are necessary for the formation of a cohesive tie (Mentis and Prutting, 1987).

g) The most prominent finding in the patient's discourse was their inability to organize information as reflected by use of stereotyped phrases and excess of repetitions (Kaczmarek, 1984). Our discourse pattern correlated with Hartley and Jensen's (1985) category of 'impoverished discourse'.

h) Also, HI cases had a slower rate of imparting information. They required more words and time to convey the essential information (Ehrlich, 1988).

i) Discourse analysis indicated that the HI subjects' discourse limitations were least evident at the level of sentence formulation and most evident in the linguistic and cognitive organization of the text. (Liles et al, 1989).

J) Disruption in information structure in narrative discourse (Chapman et al, 1992).

k) Moreover, there were fewer clauses per utterance and the use of complex constructions was less than normal adults (Dennis and Barnes, 1990; Hartley and Levin, 1990).

1) The pragmatic behaviors frequently found to be inappropriate were prosody, affect, turn taking initiation, pause time, quantity or conciseness and fluency (Prutting and Binder, 1984).

m) Word finding ability was the best predictor of the severity of linguistic disorders resulting from CHI. (Sarno, 1980, 1984).

However, narrative discourse and story generation were found to be a better indicator of the language impairment in such cases.

n) Graphic skills, were characterized by errors in spelling incomplete sentence construction and poor syntax (Groher, 1977). Apart from these agreements, there are a few disagreements also, as under:

i) Tangential discourse.

difficulty comprehending extended language especially under time pressure etc. (ASHA, 1988).

The discourse was not found to be tangential though the intra and intersentential cohesion was minimal. Other features listed by ASHA were not tested for.

ii) Non fluent aphasia (Campbell and Dollaghan, 1990; Ludlow et al, 1986 and Luzzatti et al, 1989). This could be explained by the smaller sample size but mostly, because all the cases in the present study were mildly head-injured unlike their severe cases

iii) The other pragmatic behaviors listed by Prutting and Binder (1984) couldn't be checked up, as the discourse was of the 'narrative' kind rather than 'conversational'.

SUMMARY

CHAPTER V

SUMMARY

The present study was undertaken to study the language characteristics seen in the head-injured patients, mainly on the Indian population. The main aim was to study the language impairment for a better rehabilitation of the head-injured.

The review of literature was mainly Western due to the lack of similar studies on the Indian population. The major findings in the literature were predominance of anomia, Wernicke's aphasia, non-fluent aphasia, and an impoverished discourse. The head-injured were found to have problems in cognitive tasks, memory tasks, in organization and in handling of executive jobs. The need for extensive formal testing was emphasized as these features could not be detected in routine testing for aphasia.

Ten adults with a history of significant HI were taken. A detailed language history was taken which was followed by WAB and LPT. THe discourse section of LPT was recorded for every case.

The scores obtained on different sections of WAB and LPT were analyzed. Sensitivity index was calculated for items in the syntax section. A comparison was made with the available western and Indian norms. It was found that the head-injured as a group performed poorly than normals while better than post CVA anomics.

Syntax section of LPT and discourse were found to be grossly affected. The results of the present study were found to be in agreement with the results of a number of investigators.

Hence, it is concluded that HI cases, though better than Post CVA anomics, do have some peculiar language characteristics, which need to be probed into by extensive testing, in order to ensure better rehabilitation of the Head injury cases.

CONCLUSION

CONCLUSION

Taking into consideration the above findings and especially the results of the discourse analysis, we conclude that even the mild HI cases, have considerable language impairments. These may vary from minor errors like a few irrelevant phrases to gross errors like syntactic errors, total disorganization, lack of cohesion and lack of anaphoric references. These errors are going to be detected only by formal testing including discourse. Analysis of conversional discourse, along with the narrative discourse may prove to be of considerable help.

Thus, the management team for the HI patient, including his/her family should bear in mind that these not so obvious errors might handicap the affected people in their daily life as well as in their jobs. So, attention needs to be paid to them and the services of a speech language clinician needs to be availed of. We hope that this study will help all the members of the Head injury rehabilitation team understand their problems better and in turn, help them in a better way.

LIMITATIONS

LIMITATIONS

This study still has its limitations. They are:

1. Small sample size.
2. Only mild head injury cases were taken.
3. Psychological testing was not done.
4. Only closed head injury cases were taken.
5. Two different groups viz Right HI and left HI could not be formed.

SUCCESTIONS

SUGGESTIONS

Further work can be done by taking a larger sample, by taking various degrees of HI, taking both open HI and CHI cases and also by studying Right HI cases as a separate group.

Psychological testing should preferably be done. Cognitive and language impairments can be correlated. Moreover, recovery patterns can be studied in these cases.

While testing, conversational discourse along with narrative discourse should also be taken into consideration.

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APPENDIX

APPENDIX 'A'

Rancho Los Amigos scale of cognitive levels and expected behavior : (Hagen, 1981) (cited in Adamovich et al, 1985).

Level I	NR	Unresponsive to all stimuli
Level II	Generalized response	Inconsistent, nonpurposeful, non-specific reactions to stimuli. Responds to pain, but response may be delayed.
Level III	Localized responsive	Inconsistent reaction directly related to type of stimulus presented. Responds to some commands. May respond to discomfort.
Level IV	Confused, agitated response	Disoriented and unaware of present events with frequent bizzare and inappropriate behavior. Attention span is short and ability to process information is impaired.

Level V	Confused inappropriate, nonagitated response.	Nonpurposeful random or fragmented responses when task complexity exceeds abilities. Patient appears alert and responds to simple commands. Performed previously learned tasks but is unable to learn new ones
Level VI	Confused appropriate response	Behaviour is goal directed. Responses are appropriate to the situation with incorrect responses due to memory difficulties.
Level VII	Automatic appropriate response	Correct routine responses which are robot like. Appears oriented to setting, but insight, judgement and problem solving are poor
Level VIII	Purposeful, appropriate response	Correct responding, carry over of new learning. No required supervision, poor tolerence for stress and some abstract reasoning difficulties.

APPENDIX 'B'

Glasgow coma scale (Teasdale and Jennett, 1974). (cited in Adamovich etal, 1985).

Eyes	open	Spontaneously	4
		To verbal command	3
		To pain	2
	No response		1
Best motor response	To verbal command	Obeys	6
	To painful stimulus	Localizes pain	5
		Flexion - withdrawal	4
		Flexion - abnormal (decerebrate rigidity)	3
		Extension (decerebrate rigidity)	2
		NR	]

Best verbal response	Oriented and converses	5
	Disoriented and converses	4
	Inappropriate words	3
	Incomprehensible sounds	2
	NR	1
Total		3 - 15