

Validation of Discourse Analysis Scale on Adults with Diverse Brain Insults

by Hema N

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PROJECT PROPOSAL FORMAT

Part -A

1.0	Title of the Project	Validation of Discourse Analysis Scale on Adults with Diverse Brain Insults
1.1	Area of Research :	Speech-Language Sciences and Cognition
1.2	Principal Investigator	Dr. Hema. N
1.4	Principal Co-Investigator(s)	Dr. Shyamala.K.C
1.5	Collaborating Institution	Nil
1.6	Total Grants Required (in figures and in words)	Rs 5, 38, 000 (Five lakhs thirty eight thousands only)
1.7	Duration of the Project	One year
2.0	Project Summary (Max. 300 words)	Details enclosed.
3.0	Introduction (under the following heads)	More details in the actual proposal
3.1	Definition of the problem	<p>: i) Discourse Analysis Scale, consisting of all the parameters of discourse for three different genres will be utilized as a clinical tool to diagnose cognitive communicative disorder among the clinical population with diverse brain insults.</p> <p>ii) Establishing the efficiency of Discourse Analysis Scale in evaluating the executive control deficits related to the ability of comprehension and expression of discourse utterances (conversational, narrative and picture description) in individuals with diverse brain insults causing cognitive communicative disorders.</p> <p>iii) Validation of Discourse Analysis Scale for individuals with cognitive communicative disorders would help to confirm the diagnosis of the individuals with cognitive</p>

communicative disorder and thus differentiate among the clinical population with diverse brain insults.

- 3.2 Objectives : Enclosed
 - 3.3 Review of status of research and development in the subject : Enclosed
 - 3.4 International and national status : Enclosed
 - 3.5 Importance of the proposed project in the context of current status : The outcome of the study will provide clinical tool to differentiate among the clinical population with diverse brain insults
- 6.0** **1** **Implications of the results of the study (Illustrative)**
File enclosed
- a) Presentation of scientific papers in professional seminars / publication of articles : The outcomes will be presented and published.
 - b) Discussion with professionals :
 - c) To utilize the results in the development of remediation : The outcome of the study will provide a clinical tool to differentiate among the clinical population with diverse brain insults
- 7.0** **Utilization of results of the study**
The outcomes will be presented and published.

VALIDATION OF DISCOURSE ANALYSIS SCALE ON ADULTS WITH DIVERSE BRAIN INSULTS

Project Summary

There is increasing attention paid to different types of discourse genres and an array of approaches to measure them. Discourse is borrowing from the disciplines of pragmatics, behavioral psychology, and sociolinguistics. Particular techniques in discourse analyses have been derived from the psycholinguistic analyses like measures of syntax, productivity and content. Sociolinguistic techniques include cohesion analysis, analysis of coherence, analysis of topic and compensatory strategies. Discourse is generally affected in cognitive communicative disordered population. Discourse Analysis Scale (DAS) (Hema & Shyamala, 2013) may be a better test to assess cognitive communicative ability in multiple levels of different discourse genres in clinical population with diverse brain insults. These diverse brain insults, including traumatic brain injury and right hemisphere damage, stroke leading to aphasia, infections, and tumors, neurodegenerative diseases causing Parkinson's diseases and dementia, and prolonged acute symptomatic seizures lead to a condition called cognitive communicative disorder. DAS includes the discourse structure, communication intent, topic management, information content, adequacy, message accuracy, speech related parameters, turn taking, use of repair strategy and revision behaviors under the propositional and non-propositional aspects respectively. These important domains of discourse analysis are not present as major domain in the conventional language tests used for assessment of cognitive communicative abilities in clinical population with diverse brain insults.

Introduction

Neurological Insults is very common diagnosis, but with the medical name of neurological insults people would not recognize them. In 1997, the Brain Injury Association Board of Directors adopted a definition of acquired brain injury to broaden the definition of brain injury beyond that only produced by trauma. An acquired brain injury (ABI) is an injury to the brain that has occurred after birth. The injury commonly results in a change in neuronal activities that affect the physical integrity, the metabolic activity, or the functional ability of the cell. Causes of acquired brain injury include external forces applied to the head and/or neck (e.g., traumatic brain injury with or without skull fracture), anoxic/hypoxic injury (e.g., cardiopulmonary arrest, carbon monoxide poisoning, airway obstruction, hemorrhage), intracranial surgery, vascular disruption, arteriovenous malformation (AVM, thromboembolic events, fat emboli), infectious diseases, intracranial neoplasms, metabolic disorders (e.g., hypo/hyperglycemia, hepatic encephalopathy, uremic encephalopathy), seizure disorders and toxic exposure (e.g., substance abuse, ingestion of lead and inhalation of volatile agents). Every year, 1.7 million people are diagnosed with a Neurological Insult; of those 1.7 million, 52 thousand die, 275 thousand are admitted to the hospital, and 1.365 million are treated in the ER (Fault, 2010). Neurological Insults are among one of the most common injury related deaths and disabilities in the United States, which occurs in all ages, races, societies, and revenues (Coronado, 2009).

There are two types of brain injuries that are classified as traumatic and non-traumatic Neurological Insults. *Traumatic Neurological Insults* includes traumatic brain injury (TBI). TBI is a brain injury that is a result of trauma; it has two different diagnosis which are diffuse axonal and contusions. The diffuse axonal injury is the most common type of Neurological Insult that is diagnosed through a traumatic Neurological Insult. It is a contusion that occurs when there is bruising of the brain tissue at the site of the fractures known as coup. A diffuse axonal injury happens when parts of the brain have moved because of impact to the skull (McCormack, 2008). A contusion to the brain is when the brain is swelling in a particular area that causes bleeding to the brain tissue. A contusion is more commonly diagnosed than a concussion. An outcome to a contusion depends on how extreme the injury is. Minor contusions are able to heal on their own

with no medical interference, while severe contusions can cause herniation of the brain, and eventually coma. Yearly death rates of a cerebral contusion vary with age, but increase with an increase in age. Mortality rates do decrease after the first year, which is very dangerous for infants (Newsome, 2012).

A *Non-traumatic Neurological Insults* is one that is not caused by a trauma, but caused from poisoning, a tumor, infections (encephalitis or meningitis), cell toxicity, or degenerative disease. These types of non-traumatic brain injuries occur through strokes, heart attacks, near-drowning experiences, strangulation, a diabetic coma, poisoning or other chemical causes. These degenerative conditions include Alzheimer's or Parkinson's disease (BIC, 2011). A non-traumatic injury is one in which there are no cuts or broken bones involved. According to the Brain Injury Center of America, any injury to the brain that does not result from Non-traumatic injury does not injure the brain using physical force, but rather occurs from poisoning, a tumor, infections or degenerative disease (2011). According to North Eastern Ontario (NEO) Brain Injury Network, types of non-traumatic injuries consist of Meningitis or Encephalitis, Hypoxic Injury, electrolyte imbalance, metabolic disorder, or vascular problems.

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These diverse brain insults, including traumatic brain injury and right hemisphere damage, stroke leading to aphasia, 19 infections, and tumors, neurodegenerative diseases causing Parkinson's diseases and dementia, and prolonged acute symptomatic seizures, such as complex febrile seizures or status epilepticus (SE) lead to a condition called cognitive communicative disorder. The brain is one of the most fragile parts of our body so whether or not the patient has a traumatic or non-traumatic brain injury it is still a very serious disease. The problem with Neurological Insult is that people are still suffering from cognitive communicative disorders because the procedures and rehabilitation are not done to the extent they are supposed to be to be fully recovering them, or being as minimal as they can be. Here is an attempt to conduct research on these clinical populations with diverse brain insults exhibiting cognitive communicative deficits. Since the cognitive communicative deficits are manifested at discourse level, there is a need to validate the existing Discourse Analysis Scale at conversation, narration and picture description task.

Discourse analysis was first referred to by the linguist Zellig Harris. In the year 1952, he named his study as 'discourse analysis' after investigating the connectedness of sentences. He

was of view that discourse analysis was procedurally a formal methodology, that is derived from methods of linguistics analysis structural in nature and such a methodology ably could break down a text into relationships such as substitution, equivalence, among its constituents at lower level. Harris's view of discourse held structural so centrally to that he also put forth an argument that what opposes discourse to a random sequence of sentences is precisely the fact that it has structure: a pattern by which segments of the discourse occur (and recur) relative to each other. A sentence's true meaning cannot be assigned by its linguistics construction only but it largely depends on reference (meaning in relation to exterior world) and sense (meaning in relation to linguistic system). This parameter measures how well a speaker's discourse is forethought and organized in terms of the overall plan, theme of topic. It accounts for the correct description of the events before their occurrence.

Discourse analysis checks on the use of assumed background knowledge of the topic of conversation, cultural knowledge, general knowledge on areas of life, interpersonal knowledge like specific and possible knowledge about the history of the speakers themselves. This information plays a vital role in understanding the meaning of a word. The speaker's meaning is dependent on the assumption of knowledge that is shared by both the speaker and the listener. The speaker constructs the linguistic message and intends a meaning, and the listener interprets the message and infers the meaning (Brown & Yule, 1983; Thomas, 1995; Yule, 1996; Stilwell Peccei, 1999). Thus, discourse analysis is acknowledged as an important tool for speech-language pathologists, although it is often not the assessment tool of choice due to its apparent time-consuming nature and the overwhelming number of options available. The wide range of analyses available to clinicians such as the number of T-units and total words produced or Pragmatic Protocol checklists make it difficult to choose assessment measures.

Both researchers and clinicians are frequently facing the difficulty of how to evaluate the cognitive communicative impairment in the connected speech of persons with diverse brain insults for example aphasia, right hemisphere damage, dementia, traumatic brain injury and Parkinson's diseases causing cognitive communicative disorder, where it is invariably affected. Methods for both structural and functional discourse analysis have been developed in both Western and Indian context. The structural assessment includes the analysis of micro-linguistic and macro-linguistic abilities. The former refers to lexical and morpho-syntactic aspects of

language processing and can be analyzed in terms of lexical errors (e.g. phonological errors, verbal or semantic paraphasias or use of indefinite terms) and/or syntactic organization (e.g. proportion of complete sentences, syntactic complexity). Macro linguistic abilities relate to pragmatic and discourse-level aspects of language processing and can be analyzed in terms of errors of cohesion, local and global coherence (e.g. presence of tangential utterances or extraneous propositional content). The functional approaches to discourse processing abilities have mainly focused on the ability to convey information. These abilities can be assessed qualitatively or quantitatively. From an attempt of compiling all these discourse variable, Discourse Analysis Scale (Hema & Shyamala, 2013) was formed as a part of Ph D thesis work of the Principal Investigator and as a part of ARF project the same is in the processes of standardization.

Individuals with aphasia, right hemisphere damage, dementia, traumatic brain injury and Parkinson's diseases are the clinical population manifesting cognitive communicative impairment. Their discourse domain is not completely assessed since it is only a subsection in the existing traditional language tests and cognitive protocols. Hence there is a dire need to validate the existing Discourse Analysis Scale (Hema & Shyamala, 2013).

Background and Justification

International status

2 Discourse genres are separated into two broad categories: monologic (monologues) and interactive. *Monologues*, which do not require interaction, encompass a number of genres including descriptions, narrations, and procedural and expository discourse (Cherney, 1998). Descriptive discourse entails the distribution of features and concepts of a stimulus. Narratives involve storytelling, either through story creation or story retelling. Procedural discourse includes explanations of a series of actions to perform a task. Expository discourse informs a listener of a topic through facts or interpretation and draws upon higher-level thinking skills, such as comparison and contrast, cause and effect, and generalization. In contrast, *conversational discourse* is interactive with participants' alternating roles as speaker and listener to exchange ideas, thoughts, and feelings. Conversation is the prevalent mode of human communication and

thus it may be argued that it has greater ecologic validity or how well a measure relates to real-life situations than monologic discourse. But monologic discourse also has ecologic validity as everyday conversation often incorporates a narrative framework. Furthermore, storytelling often is embedded in social exchanges (Mar, 2004). Monologic discourse may be more useful clinically than conversational discourse.

In a study of the relationship of discourse to functional outcomes after TBI, narrative and procedural discourse measures were better correlated than conversational discourse measures with social integration and quality of life (Galski et al., 2008). Narrative discourse presents the possibility of systematic and quantitative examinations not offered by conversational discourse. In addition, elicitation of discourse through the use of stories or procedures makes it possible to identify the elements of the targeted output that can serve as the standard for comparison. But conversational tasks do not provide an equivalent target against which an elicited interaction can be evaluated. Although both conversational and monologic discourse sample distinct aspects of communication, monologic discourse has methodological advantages over conversation and thus it is also suited for predicting and monitoring recovery in an individual following TBI. Thus there is a need to analyze discourse in different genre or more than one genre.

Conversational discourse was analyzed by Murray and Lenz (2001) in persons with Parkinson's Diseases (PD) and stated that syntax was not impaired in PD group. However, they found significant difference between length of utterances and sentence complexity in the PD group. The length of utterance and syntactic complexity was reduced in the PD group. The authors compared and contrasted this study with the previous study by Murray (2000) and concluded that persons with PD presented better performance in open ended tasks like conversation than in controlled tasks (e.g., picture description). The findings of Murray and Lenz lend support to the previous finding that syntactic complexity and sentence length are associated to cognition, especially the working memory ability. Impairment in sentence production is also related to the abnormalities in the spread of activation within the semantic system. For instance, Copland, Chenery, and Murdoch (2000) and Copland (2003) concluded that persons with PD are impaired in inhibition of inappropriate meanings of words following long presentation intervals. In view of this, sentence production involves the selection of lexical items and sentence

construction to fit in a non linguistically specified conceptual representation. ¹ This lack of ability to inhibit alternative word selection can interrupt the smooth flow of speech in PD.

Holtgraves, Fogle, and Marsh (2013) checked the degree of informativeness in PD for a general conversation task. Twenty individuals with Parkinson's disease constituted the experimental group and 20 individuals as control group. Language production measure was conducted through semi-structured interviews with each participant individually. The interviews consisted of questions regarding the interviewees' family, work history, daily activities, etc. for fifteen minutes. All interviews were recorded and transcribed for analyses. Analysis was done using a five-point coding scale for informativeness which was later collapsed to a three-point scale (under-informative; i.e., too little information provided; over-informative; i.e., too much information provided; appropriate level of information). The results revealed that the participants with PD produced more utterances classified as under informative than the non-PD participants thus demonstrating reduced information content in the language of people with PD. They noted the deficit to be evident during a naturally occurring verbal interaction rather than with a laboratory task. For the PD participants, this deficit occurred due to the inability to recognize others' speech acts, i.e. it was difficult to generate meaningful contributions to a conversation without understanding the intent and presupposition skills of the conversation partner. Finally they correlated both speech act priming and utterance informativeness to a measure of executive control. They concluded that the executive control deficits are related to the ability to both comprehend and produce conversational utterances.

³ To sum, a look into the literature revealed that studies on analyzing the discourse skills are limited in individuals with PD. The studies that have been conducted reported that discourse skills are affected in persons with PD, especially the conversational appropriateness, speech acts, stylistics, gestures, and prosody. They scored lower on eye contact, intonation, turn taking, response length, and conversation initiation, and speech act recognition. They also reported that persons with PD exhibited poor speech monitoring, were unaware of their conversational breakdown and made reduced attempts to correct conversational breakdown using repair strategies. The affected discourse skills and poor awareness of communication breakdown together pose a great threat to social communication skills in persons with PD. Further, much less is known regarding the type and the extent of discourse function in this population. No such

studies have also been carried out in the Indian context. In addition, no studies have addressed the changes in discourse skills, if any, across different stages of the condition. Due to the paucity of work in this area, the present research has been planned to check the discourse in persons with PD and thus validate the discourse analysis scale.

8 Research to date indicated that discourse changes in Dementia of Alzheimer type are predominantly pragmatic in nature (Ex: difficulties in expressing communicative intentions, maintaining languages and information balance, and drawing inferences) (Ripich, Vertes, Whitehouse, Fulton, & Ekelman, 1991; Garcia & Joannette, 1994; Watson, Chenery, & Carter, 1999). Compared to the age-matched healthy elderly, the language content in DAT is reduced with fewer narrative themes, information units and nouns (Bayles, Boone, Tomoeda, Slauson, & Kasniak, 1989; Bucks, Singh, Cuerden, & Wilcock, 2000). In contrast, there is an increase in the number of pronouns with no antecedents or referents, deictic words, demonstratives, and pronouns along with a higher rate of referential errors (Hier, Hagenlocker, & Shindler, 1985; Almor, Kempler, MacDonald, Andersen, & Tyler, 1999).

14 Brandao, Castello, Dijk, Parente and Pena-Casanova (2009) reported an investigation on the cognitive and linguistic mechanisms involved in knowledge management during discourse production of persons with Alzheimer disease (AD). Two discourse variables were examined, incomplete propositions and repeated propositions.

7 Ash et al., (2009) assessed speech fluency in 35 persons with frontotemporal lobar degeneration (FTLD) who presented with progressive non-fluent aphasia (PNFA), semantic dementia (SemD), or a social and executive disorder without aphasia (SOC/EXEC). Fluency was quantified as the number of words per minute in an extended, semi-structured speech sample. PNFA people were significantly less fluent than healthy elderly and other persons with FTLD. Fluency correlated with grammatical expression but not with speech errors or executive difficulty. Persons with SemD and SOC/EXEC were also less fluent than controls. In SemD, fluency was associated with semantically limited content. In SOC/EXEC, fluency was associated with executive limitations.

National status

Deepa, Sudheer and Alladi (2008) described the ability of persons with five types of dementia with mild cognitive impairment. Language screening, cognitive assessment using Addenbrooke's cognitive examination revised, Rey Auditory verbal learning test, Rey Complex figure test, along with discourse data were gathered on picture description and narration tasks. Samples were analyzed under different discourse components. As a result, persons with mild cognitive impairment had significantly reduced cognitive skills in terms of attention and orientation, memory, visuospatial skills and language fluency. Their communication was disturbed by reduction of essential information, and impaired coherence and tangential and preservative language, despite increased verbal output. Whereas, MCI showed many impairments of object naming or identity, that could be explained completely in terms of plain naming difficulties. Speech output may be empty or non-meaningful and little information is conveyed, reflecting reduced use of precise terms and increased use of broad general terms.

Cognitive and linguistic analysis at the level of discourse was attempted by Hema and Shyamala (2008). In this study, experimental group comprised of 20 TBI subjects with moderate to severe injury. Within TBI group there were two subgroups, viz. Left Hemisphere Damage (LHD), and Right Hemisphere Damage (RHD). Age, sex and education matched normal subjects were selected as a control group. A discourse sample was elicited between the investigator and the subjects on preset topics for two sessions. A 10-20 minutes sample thus obtained was considered for analysis. A sample of picture description task was also considered. Transcription of the recorded sample using broad International Phonetic Alphabet was done. Various speech discourse parameters under the propositional and non-propositional aspects of conversation and picture description tasks were analyzed. Perceptual rating scales were used to assess all the parameters. Results were statistically analyzed for significant difference in performance between the TBI subjects with LHD, RHD group and normal speakers. A non parametric test was used to note if there was any significant difference between the three groups in terms of discourse. Discourse analysis procedure was used to assess the discourse ability in individuals with TBI and normal speakers. All the parameters of discourse were significantly different between the TBI subjects and normal speakers. Comparison across TBI subjects with LHD and RHD group showed a significant difference only in communication intent; greets others by himself/herself, introduces self, turn taking, conversational repair, fabricates/ imagines events and delayed response parameters.

The findings of Deepa and Shyamala (2012) profiled the qualitative and quantitative impairment in the discourse abilities of persons with mild dementia. The discourse deficits in PWD directed from their study highlighted the underlying cognitive impairment. The discourse of PWD lacked planning, organization and cognitive flexibility skills which are the hallmark of dementia. A strong statistical difference between monolingual and bilingual individuals implies that the spoken discourse is served by a better cognitive reserve and flexibility in bilinguals as compared to monolinguals. There seems to be a co-relation between discourse abilities and underlying cognitive functions. There is a need to substantiate this using cognitive linguistic assessment like discourse analysis.

Study by Nandita and Swapna (2014) verified the finding in the literature for occurrence of non motor symptoms such as subtle language deficits like reduced communication intent, information content and accuracy before the occurrence of overt speech symptoms in individuals with Parkinson's Disease (PD). Discourse was found to be affected in individuals in PD and progressed with the severity of the disease. It can be inferred from the study that the discourse can be used as a tool for the assessment and intervention of language deficits in individuals with PD. There are hardly few studies rather no studies which have used appropriate discourse analysis scale to assess the discourse parameters qualitatively or quantitatively.

Main strengths of the study

Use of Discourse Analysis Scale (DAS) will enable to identify cognitive communicative deficits in clinical population with diverse brain insults despite passing on traditional language tests. DAS will be an advanced test in comparison with the traditional language test which assesses only the basic linguistic competency of any individuals with brain insults. DAS assess discourse in three different genres. DAS is an extensive test of discourse with less effort, follows non-invasive procedure and doesn't require high cost equipments. Cognitive communicative deficits in clinical populations with diverse brain insults will be made aware of their discourse impairment through this assessment and later facilitate intervention at discourse since they are not aware of their impairment at discourse level. Since cognitive communicative disordered populations "talk better than they communicate", certain cognitive aspects influence communication at discourse level. On administration of discourse analysis scale these cognitive

aspects can be outlined. The DAS will be helpful in estimating the prevalence of the cognitive communicative disorders/deficits in Indian population with diverse brain insults.

Aim

²³ The aim of the present study is the validation of Discourse Analysis Scale (DAS) on Adults with Diverse Brain Insults.

Objectives

The main objectives of the present study are

1. To validate the Discourse Analysis Scale (DAS) on individuals with diverse brain insults like aphasia, right hemisphere damage, dementia, traumatic brain injury and Parkinson's diseases exhibiting cognitive communicative deficits.
2. To evaluate the effectiveness of DAS in assessment of discourse of individuals with diverse brain insults and having Cognitive Communicative Disorders.
3. To evaluate the effectiveness of DAS in differential diagnosis of the above cognitive communicative disordered population.

Method

Participants: Selection criteria

- Participants with a diagnosis of aphasia, right hemisphere damage, dementia, traumatic brain injury and Parkinson's diseases confirmed by a neurologist will be considered for the study. These individuals could be ³ in the age range of 20 to 60 above years and 5 participants from each type will be considered to form a subgroup of five in number. In total 25 participants with cognitive communicative disorder will be considered for the present study. ¹ They should have had a minimum of 10 years of formal education.
- Participants with (1). Aphasia (Fluent Aphasia) receives ¹ a confirmation from a speech language pathologist regarding the presence of aphasia component using Western

Aphasia Battery (Shyamala & Ravikumar, 2008). (2). Right hemisphere damage (due to traumatic brain injury) will be confirmed on administration of Right hemisphere test battery, these participants should be verbal. (3) For persons with dementia (Alzheimer's type) on administration of Clinical Dementia Rating scale the diagnosis of mild/moderate/severe dementia will be confirmed in association with the score obtained from MMSE. (4) The participants with a diagnosis of TBI (closed head injury) will be confirmed by a neuro-surgeon. Where the severity of mild to moderate TBI will be selected for the study that would be assessed based on the administration of Glasgow Coma Scale (GCS) (Jennet & Teasdale, 1981) by a staff nurse. (5) The final clinical group with Parkinson's diseases (Early stage) was considered based on the clinical diagnosis made by an experienced neurologist. They will be further classified into early (inclusive of stage 1 and 2 in Hoehn & Yahr Staging) and middle stage (inclusive of stage 3 and 4 in Hoehn & Yahr Staging) of idiopathic PD based on the Hoehn and Yahr staging (1967) and a checklist to identify the stage of idiopathic PD based on speech, motor, and swallowing problems (Amulya & Swapna, 2012).

- All the participants should be bilinguals but predominantly Kannada monolingual. The proficient language or L1 had to be Kannada (Mother tongue). L2 and/or L3 could be English (most frequently used/or medium of instruction at school/college) and/or Hindi and/or Tamil. They should have obtained a score of "three" and above on the International Second Language Proficiency Rating Scale (ISLPR) by Wylie & Ingram (2006), suggesting that the candidate would have basic vocational proficiency in that particular language. The scale will be administered both in Kannada as well as English.
- All these participants should belong to a middle/high socioeconomic status as per the rating on re-adapted version of National Institute of Mental Health (NIMH) Socioeconomic Status Scale, (Venkatesan, 2009).
- Source of the participants with aphasia and right hemisphere damage will be from the All India Institute of Speech and Hearing, Mysuru, Karnataka, India and the participants attending a geriatric clinic at the National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, Karnataka, India. A few of the participants will be selected from Nightingales Medical Trust (a day care and residential shelter for persons

with dementia and Parkinson's diseases), Bangalore, Karnataka, India. Individuals with traumatic brain injury will be chosen from the Apollo BGS Hospital, Mysuru, Karnataka, India.

Test materials used and procedure: The Discourse Analysis Scale (DAS) (Hema & Shyamala, 2013) developed as part of the thesis titled "Discourse Analysis in Kannada-English Bilingual Individuals with Traumatic Brain Injury" will be used.

1 Discourse Analysis Scale analyzes the discourse samples qualitatively using a perceptual rating scale. It consists of a set of parameters and a list of skills under each parameter. Each skill will be rated separately and a final index will be obtained for them. The scale has separate ratings for conversation, narration and picture description. It measures the propositional and non-propositional aspects of conversation, narration and picture description. It consists of the following information:

1 The propositional aspects of discourse includes discourse structure, communication intent, coherence, information adequacy, information content, message accuracy, temporal and causal relationship, topic management, vocabulary specificity, linguistic fluency, speech styles, intonation, gaze efficiency and response time. The non-propositional (interactional) aspects of communication include turn taking, revision behaviours and conversational repair/repair strategy. These parameters have been described and statements are framed to rate them. The qualitative (four point perceptual) rating scale consist of uniform rating of 0, 1, 2 and 3 where '0' represented the behaviours that are poor, '1' represented behaviours that are fair (at least 25% of the time there is positive response), '2' represent behaviours that are average (at least 50 % of the time there is positive response) and '3' when the behaviours are good (at least 75% of the time or above there is positive response). This rating scale will be used for scoring. Thus, total scores of the Discourse Analysis Scale (DAS) for conversation, narration and picture description would be obtained. These total scores of DAS for these tasks have been further divided into two sub levels, the propositional and non-propositional total. The same DAS will be administrated for all the groups in Kannada language and thus, the scores will be obtained for conversation, narration and

picture description tasks. This would take at least 2-3 sessions (30 minutes each) with each participant.

Analyses

Statistical analysis will be done using SPSS software (Statistical Package for the Social Sciences, version 19.0). Descriptive statistics will be administered during the initial stage and later appropriate statistical procedures will be used.

Implications of the study

Standardization of Discourse Analysis Scale (DAS) demonstrates two major implications, first in terms of research contributing to the existing knowledge about discourse and second is in terms of clinical implications in using discourse analysis in the field of diagnosis and rehabilitation of cognitive-communicative deficits in clinical population of diverse brain insults. This study employs three different tasks that would probably reveal different effects. The discourse assessment should therefore be done separately for these three different discourse genres. Methodologically, discourse genre can be quantified using perceptual measures. This method helps to divide the huge discourse sample into different variables in terms of propositional and non-propositional. This helps the clinician or the researcher to identify the linguistic and non-linguistic errors in the discourse and helps in differentiating between language and speech aspects. This can be clinically helpful in assessment and rehabilitation of individuals with cognitive-communicative disorder a sequelae of diverse brain insults.

Discourse analysis is a non-standardized assessment in the processing of getting standardized. Discourse analyses of the three discourse genres are time-consuming to perform but yield information regarding linguistic, cognitive, and social functioning that can be helpful in designing customized assessment and interventions for individuals with cognitive-communicative impairment. Cognitive-communication problems after diverse brain insult create serious challenges to an individual's potential for social, vocational, and academic success. Validation of discourse assessment will help the speech-language pathologists to play an important role in assessment of connected sentences than the routine simple conventional test items. Since this validation identifies the relative importance of linguistic variables at discourse

level and thereby helps in discriminating among persons with diverse brain insults leading to cognitive-communicative impairment who do not differ on conventional language assessment.

Utilization of the study

The results from the current study would help in understanding and comparing clinical and normal performance on the various variables in detail while analyzing discourse at the three different genres for assessing language comprehension and expression.

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