CHAPTER 1

INTRODUCTION

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1.5 Need For The Study
Originally the word 'discourse' comes from Latin 'discursus' which denoted 'conversation speech'. A complex system of cognitive and linguistic processes underlies the everyday use of language. Language can be viewed and analyzed on many levels. One of them is, “language in use” or discourse. Discourse is the “continuous stretches of language or a series of connected sentences or related linguistic units that convey a message” (Cherney, 1998). Furthermore, “discourse is functional communication” (Cherney, 1998).

1.1 Discourse Analysis

Discourse analysis (DA), as a tool in speech and language assessment research and clinical analysis, is a relatively recent development when compared to other forms of analysis, for example articulatory and syntactic. DA is the branch of applied linguistics dealing with the examination of discourse attempts to find patterns in communicative products as well as and their correlation with the circumstances in which they occur, which are not explainable at the grammatical level (Carter 1993). DA may be based on either monologue or conversation. These are further divided into procedural, expository, conversational and narrative. Procedural discourse is describing the procedures involved in performing an activity. Expository discourse is conveying information on a single topic by a single speaker. Conversational discourse is the one which conveys information between a speaker and listener or among speakers and listeners to exchange ideas, thoughts, and feelings. And narrative discourse is a description of events. The use of this analysis remains largely limited to research and within academic settings, mainly as a result of the time-consuming nature of transcription on which DA is currently based. The time required to transcribe and analyze lengthy discourse samples puts discourse analysis out of reach for most practicing clinicians (Boles & Bombard, 1998). It is often not the assessment of choice due to its apparent time-consuming nature and the overwhelming number of options available (Togher, 2001). Here DA mainly includes conversational discourse, since it is a prevailing mode of human communication. On comparison with different discourse genres it is argued, that conversation has greater validity to real-life situations than monologues. Therefore, assessment of discourse among any individuals should focus primarily on conversational discourse. However, monologic
discourse also has clinical validity in terms of easy and quick evaluation. Hence discourse analysis based on conversation and monologue plays an important role both in theoretical and clinical awareness. Thus, present study is based on the discourse analysis of different type of speech samples of an individual with traumatic brain injury (TBI).

1.2 Methods of Assessment of Discourse

There are several ways of analyzing discourse, one is qualitative and the other is quantitative method of analysis. The qualitative method include propositional and non-propositional analysis and quantitative include T-unit based analysis. The propositional analysis is the within-sentence analyses which includes measures of discourse structure, communication intent, informational adequacy in terms of sentential complexity, informational content and accuracy, coherences includes global and local coherence, topic management and verbal output errors includes dysfluencies, speech style, and intonation. The non-propositional analysis is the across-sentence analyses comprising of turn taking, revision behaviors and use of conversation repair. The study consists of three types of discourse genres, a conversation, narration and picture description. The conversation, narration and picture description task use the ‘Discourse Analysis Scale’ given by Hema and Shyamala (2008), as a qualitative method and T-unit based analysis as a quantitative method. The T-unit based quantitative analysis involves sequential discourse episode counts and proportion of utterances in an individual episode. In the present study only these two types of analysis procedures are used. These measures are described briefly in the method section.

1.3 Discourse Genre

Discourse can be elicited through many ways. As in the present study the discourse genre used are conversation, narration and picture description. First, in assessing communication outcome, the emphasis has moved from impairment to its consequent effects on functional activity and participation in society. Alongside this has come to
an increasing focus on conversation. Conversation is a socially vital tool but its evaluation by speech and language therapists is not yet a routine. Detailed conversation analysis is time consuming and not easily quantified. But measuring communicative informativeness under this discourse condition is perhaps the most valid means of determining the interpersonal verbal communication abilities of any individuals with or without TBI. Coordination between the speaker and listener is necessary in any conversation, but it can be shared among the speakers and they share the communicative responsibility. However, the data derived from such analyses are expensive to collect and subject to unknown sources of variability. It is known that subjects produce significantly greater percentages of informative words assessed in terms of correct information units (Nicholas & Brookshire, 1993) under conversational discourse conditions rather than structured conditions. But that the percentage of correct information units produced during structured discourse tasks could be used to predict performance under conversational conditions with a high degree of accuracy.

Second, narration involves organizing and expressing a complex series of events. This process is fundamental for human communication, yet we know little about its linguistic basis. The narrative production involves at least two components, a linguistic component and an executive resource component (Mar, 2004). Linguistic functions implicated during narrative production include phonology, morphology, lexical, and grammatical processing, which serve to express the content of an event. The second component is cognition, involves higher level of cognitive processing that play a crucial role in organizing a narrative, such as sustaining a theme through working memory, and maintaining event coherence through top-down planning and organization. These linguistic and cognitive processes must successfully interact to produce a sequence of utterances that relate to each other in expressing a logical and coherent narrative.

Third, picture description is one of the interesting and simplest tasks to elicit a discourse sample that remains as a most commonly used task during diagnostic assessment. Since it is having the added benefit of predictable content that yields relatively brief language samples within short duration and it requires little time to transcribe, assess and infer the abstract information and efficiency of coherence
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among concrete items in the stimuli. The day-to-day communicative interactions are very highly influenced by a few extraneous variables like world’s knowledge and individual’s intelligence. Using standard picture stimulus possibly may rule out these extraneous variables and make the task more equivalent among different participants. Thus, it may help in making differential diagnosis among the clinical populations and also establish the normative data in discourse. Thus, analysis of discourse varies with respect to discourse elicitation task. In this present study, two different methods of assessment/analysis of these discourse genres are done.

1.4 Factors Influencing Discourse Production

There are several factors which influence discourse production. They include, age, education, profession, cognition, proficient usage of more than single language (bilingualism/multilingualism), psychological status of the individual, etc. These factors individually or in combination may influence the spoken language production. A few factors which were considered relevant for the present study are discussed in brief. These factors included bilingualism and individuals with TBI.

1.4.1 Bilingualism.

One of the greatest challenges when writing about bilingualism is finding a theoretical framework that clearly defines what bilingualism is and who is bilingual. In fact, researchers and theorists diverge on their definitions of who is purely monolingual and who is bilingual. The definitions of bilingualism in the twentieth and twenty-first centuries have evolved from a purely dichotomous approach (monolingual vs. bilingual) towards seeing bilingualism as a complex phenomenon that includes key features. According to current linguistic, psychological, and neurolinguistic approaches, the term “bilingual” refers to all those people who use two or more languages or dialects in their everyday lives (Grosjean 1994). By considering this definition into account, it is found that more than half of the world would be considered as bilinguals (Giussani, Roux, Lubrano, Gaini & Bello, 2007).
1.4.1.1 Types of bilingualism.

The degree of proficiency in each language can be considered as a key attribute of bilingualism (Valdés & Figueroa, 1994; Romaine, 1995). Authors argue that bilingualism can be determined by how fluent the speaker is in each language and to what degree the proficiency in both languages can be compared. That is, to them, one can be a balanced bilingual with equal proficiency in both languages, or have a dominant language and be bilingual nonetheless. May, Hill, and Tiakiwai (2005) consider age as an important factor. They draw the distinction between a simultaneous bilingual, a child who acquires two languages simultaneously as a result of family or societal bilingualism, and a sequential or consecutive bilingual, is a person who acquires a second language after the first language, almost always in puberty or adulthood and often as the result of education. May, Hill, and Tiakiwai (2005) also maintain that the social status of the two languages and the personal circumstances of the bilingual individuals will have an impact on how they see themselves with reference to the two languages, and whether they will consider themselves bilingual or not. Consequently, they argue the importance of distinguishing between the elective or elite bilingual and the circumstantial bilingual. García (1997) and May (2002a, 2002b) point out that a person becomes an elite bilingual when the acquisition of the second language (L2) is actively promoted and supported, and it is clearly seen as a social and cultural asset. This individual usually becomes bilingual by means of the acquisition of an elite language in an educational setting. In this case, the learners/users of the second language (L2) are elective bilinguals, for they decide of their own free will to acquire the second language at school or in a study abroad context. Their native language (L1) and culture are not endangered by the acquisition of the L2. On the other hand, circumstantial bilinguals are those individuals who have to learn/acquire an L2 in order to survive in a given society without having a choice. This is the case of societal language usage indigenous to learn the language of their new work or of their society in order to find a place in the mainstream society at the risk of losing or balancing with their native language. In the present study this definition is relatively considered.
1.4.1.2 Bilingualism and language organization.

Investigations into the neural manifestations of bilingualism have included functional comparisons of a variety of linguistic and non-linguistic domains and studies of cortical anatomy. The earliest studies of the cortical correlates of bilingualism used behavioral approaches to examine hemispheric dominance differences between monolinguals and bilinguals, early- and late-acquired bilinguals, and high- and low-proficiency bilinguals. Hull and Vaid's (2007) meta-analyses of the data reveal that early bilinguals were the only group that showed consistent bilateral dominance for language. Late bilinguals and monolinguals showed left-hemisphere dominance. Second-language proficiency was found to be less relevant than age of acquisition in influencing language lateralization. Thus, it is proposed that a period of early monolingual development establishes left-hemispheric dominance that is then preserved irrespective of future bilingual experience. Interestingly, this decreased hemispheric dominance in early bilinguals also is observed for non-linguistic tasks. For example, Hausamann, Durmusoglu, Yazgan and Gunturkun (2004) used visual hemi field presentation to investigate face discrimination, a right-hemispheric-dominant task. Turkish-German bilinguals were more bilaterally dominant than both Turkish and German monolinguals.

However, according to Hernandez, Martinez and Kohnert (2000) and Kim, Relkin, Lee and Hirsch (1997), neuroimaging studies have failed to find consistent laterality differences between monolingual and bilingual speakers. But when neural activations for single words are meta-analyzed on the basis of the lexical processes involving semantic access, phonological code retrieval, or articulation, bilinguals and monolinguals activate similar neural regions for individual lexical processes (Indefrey & Levelt, 2004; Indefrey, 2006). What is different, though, is that specific perisylvian regions may differentially activate for individual languages of the bilingual speaker. The left inferior frontal gyrus (LIFG) has been shown to respond differentially to L1 and L2, either with different foci for L1 versus L2 or with greater volume of activation for L2 (Kim, Relkin, Lee & Hirsch, 1997). This differential activation is found only for late bilinguals and for specific linguistic tasks.
Marian, Shildkrot, Blumenfeld, Kaushanskaya, Faroqi-Shah and Hirsch (2007), for example, found that the foci of LIFG activations differed across L1 and L2 for lexical and phonological processing, but not for orthographic processing. But for syntactic processing, Saur et al (2009) found differential activation at LIFG for L1 and L2. Thus, LIFG appears to make distinctions between L1 and L2 for linguistic processes for which it serves a unique role and further research is needed to elucidate these patterns. Moreover, bilingualism may have ramifications on cortical morphology. Using high-resolution magnetic resonance imaging scans and an analysis procedure called voxel-based morphometry which checks the covariance of the cortical structures, Mechelli and colleagues (2004) found that individuals with higher proficiency in and/or earlier age of second-language acquisition had a higher gray matter density in the left inferior parietal cortex.

The scarcity of direct comparisons of bilingual versus monolingual brains during language processing tasks and the need for tasks involving more complete levels of language competence, for example at morphological and syntactic levels leaves unanswered questions about the similarities and differences between monolingual and bilingual brains. First, it is still equivocal as to whether bilinguals recruit the same classic language areas in the same manner, for the same functions of language processing, and with the same location and extent as monolinguals including the superior temporal gyrus (STG; Brodmann’s area 42/22), which is known to be important in phonological processing (Zatorre & Belin, 2001; Petitto, Zatorre, Gauna, Nikelski, Dostie, & Evans, 2000), and the left inferior frontal cortex (LIFC), this is a large left inferior frontal area that has been typically observed to participate in all aspects of language processing, including morphosyntax, semantics, and phonology. It incorporates pars triangularis and pars opercularis including the classic Broca’s area (Price, 2000; Foundas, Eure, Luevano, & Weinberger, 1998) and spans Brodmann's areas 47, 45, 44, and 6 (Hagoort, 2005). Second, the anatomical studies noted above suggest that there are structural changes in a person's brain as a result of extensive bilingual exposure, including enlargement of brain areas such as the inferior parietal cortex (Mechelli et al., 2004). To summarize, bilateral processing of language (and other nonverbal tasks) is most likely to occur only in early bilinguals. Monolinguals and bilinguals use similar neural regions for language processing. However, late bilinguals are likely to activate the LIFG differentially for processes in which the
LIFG plays a crucial role, such as phonological and syntactic processing. Finally, bilinguals have greater gray matter density than monolinguals in certain left hemisphere regions. When speaking to each other, bilingual people can quickly switch between two languages, usually choosing the word or phrase from the language that best expresses their thoughts. But bilinguals rarely slip into a second language when speaking to people who only speak one language. Being bilingual has certain cognitive benefits and boosts the performance of the brain, especially one of the most important areas known as the executive control system. Speaking more than one language keeps the brain in shape and speeds up the mental function (Jha, 2011). In agreement with these studies on neuro-typical adult bilinguals, the same language areas (locations) for language processing can be considered and can predict a correlation with traumatically brain injured individuals.

1.4.2 Traumatic brain injury (TBI).

Traumatic brain injury (TBI) has been defined as “an insult to the brain, not of the degenerative or congenital nature, but caused by an external force, that may produce a diminished or altered state of consciousness” (National Head Injury Foundation, 1985). According to this definition, TBI is caused by an external force and thereby excludes brain insult resulting from other neurological conditions. Road traffic accidents, falls, sports, industrial accidents and assaults are the most frequent causes of TBI. TBI is also known as acquired brain injury, head injury, or brain injury, causes substantial disability and mortality. It occurs when a sudden trauma damages the brain and disrupts normal brain function. TBI may have profound physical, psychological, cognitive, emotional, and social effects. The diagnosis of mild TBI appears to be vastly under diagnosed in the setting of systemic trauma and even in trauma centers.

The relationship between head injury and loss of speech has been known for thousands of years as seen in the reports of the Egyptian surgeons between 3000-2500 BC (Breasted, 1930). Descriptions of such cases have, however, been few until the time of the first and second world wars. During these periods a great amount of literature on post-traumatic aphasia secondary to penetrating wounds was published. In contrast with this abundant literature, the paucity of works on post-traumatic
aphasia in peace time is striking, and this is especially true in cases of aphasia secondary to closed head injuries.

It is found in the literature that traumatic brain injury is one of the most common neurological insults that affect individuals discourse ability. The discourse abilities of adults who have suffered TBI have revealed that although these individuals display “normal” or “near normal” language on traditional aphasia tests, they demonstrate varying levels of impairment in the coherence, cohesion, and informational content of their extended verbal production (Hagen, 1984; Ylsivaker & Szekeres, 1989, 1994; Hartley & Jensen, 1991; Coelho, Liles, & Duffy, 1994). These individuals are found to be lacking in many areas of conversational discourse (Allen & Brown, 1976; Milton, 1984; Mentis & Prutting, 1991). One of these is interactional aspects or non-propositional aspects. This deals with the behaviors that reflect as the reciprocal nature of conversation and the joint co-operation required for the participant (Mc Tear, 1985). Here they experience difficulty when called upon to function as a discourse partner. Another area is propositional aspects of conversation. This deals with how discourse is organized with respect to overall plan, theme or topic and how individual utterances are conceptually linked to maintain unity (Hartley, 1995). Here they exhibit inability to focus on, filter relevant versus irrelevant stimuli, organize, retain and retrieve the stimuli in a conversation, whether in conversation or referential communication.

One of the oldest forms of discourse analysis proposed by Grice (1975), in his model of conversational practice was within a pragmatic framework to measure the success of conversation. According to him there are four levels, first the quantity where the speakers will say no more than/less than what is required. Second the quality where the speaker will say only what he/she believes to be true and has evidence for. Third the relevance where the speaker will say only what is relevant. Last the manner, here the speaker will impart information in manner, which is clear and unambiguous. All these different forms of discourse fall under the label generative discourse. This discourse which is the combination of cognitive and linguistic processes should be more sensitive to characterize the types of communication deficits that various clinical populations may exhibit in the context of daily living.
The communication of people with acquired brain injury (ABI) differs from that of people without neurological injuries. As early as 1984, Milton, Prutting, and Binder stated that survivors of brain injuries “talk better than they communicate”, meaning they often speak fluently and without an unusual number of grammatical errors but fail to communicate their intents effectively and efficiently. Professionals label this type of language disorders as cognitive-communication impairment and define it as a decreased ability to perform language-based activities because of a deficit in one or more cognitive functions underlying communication (e.g., Attention, executive functioning, memory etc) (ASHA, 1991; Coelho, 2007).

Research has identified measures that successfully differentiated the discourse of individuals with brain injury from that of healthy participants on productivity, t-units, cohesion and story grammar (Cherney, Shadden & Coelho, 1998). Rousseaux, Ve`rigneaux, and Kozlowski (2010) attempted to correlate these measures with performance in aspects of cognition thought to underlie discourse performance (e.g., memory, attention, executive function). In their results they have established a link between the aspects of discourse (cohesion) and cognition (executive function and working memory) at a moderate level with inconsistent correlations. Thus, it is one of the critical challenge remained for the future research.

A study by Bara, CuticaI and Tirassa (2001), compared TBI and neurologically intact individuals in their ability to interpret video vignettes in which actors depicted simple and complex standard communicative acts (i.e., direct and indirect requests, deceit, irony) and failures of communication using only nonverbal cues such as pointing gestures (e.g., pointing toward the person to whom the speaker refers). The results showed that the two groups did not differ in their interpretations of simple and complex communicative acts, but that individuals with TBI performed significantly worse in interpreting deceit, irony, and failures than their neurologically intact counterparts did. These findings suggest that individuals with TBI show impaired ability to draw inferences from nonverbal cues in interpreting particular communicative acts. There is widespread consensus that TBI, and acquired brain injury more broadly, can result in cognitive-communication deficits and that these deficits interfere with academic, vocational, and interpersonal pursuits (Coelho, 2007).
1.4.2.1 Relationship between cognition and communication.

Cognition is a general term that refers to both stored knowledge and the processes for making and manipulating knowledge. The linguistic representations for objects are part of long-term lexical memory and must be retrieved and brought to consciousness. If the simple act of naming access to long term memory, association, recognition, decision making, motor planning and self monitoring, it can be imagined how much the cognitive skills are required for the act of communication. According to Fodor (1975) the brain appears to have a language of its own and the output of this language is translated to human natural language. To ensure what a person intend to say, he has to monitor the utterances and make judgment about them. Thus, the production of linguistic information uses semantic memory, lexical memory, working memory, motor procedural memory and the central executive system. Linguistic comprehension ultimately involves deriving the right concepts and propositions. It is the product of sequential and parallel processes that involves many parts of the nervous system. Hence the production and comprehension of language cannot be separated from cognition. Rather, communication is a manifestation of cognition. Individuals with TBI have difficulty in processing linguistic information because they have trouble in thinking and planning and organizing ideas. This is because the information-processing abilities at sentence level are disturbed due to diffuse injury. Thus, discourse relies on the interaction of both linguistic in terms of comprehension and expression and non-linguistic knowledge, especially the non-linguistic systems of executive control and working memory (Cannizzaro & Coelho, 2002). But, a study by Melissa, Duff, Bilge, Lindsey and Turkstra (2012) review the basic principles of distributed cognition and the implications for applying this approach to the study of discourse in TBI individuals with cognitive-communication disorders. A core theoretical principle of distributed cognition is that cognition, learning, and knowledge are not confined to an individual but rather are distributed across individuals and the environment. From this perspective, the unit of analysis is not an utterance, an individual, or a specific domain of cognition with the individual. But it is a framework for understanding interaction among communication partners, interaction of communication and cognition, and interaction with the environments and contexts of everyday language use. In support to this Hutchins (2011) distributes three ways of cognitive processes when observing human activity. Firstly, cognitive
processes may be distributed across the members of social groups. Second, cognitive processes may involve coordination between internal and external (material or environmental) structure. Third, cognitive processes may be distributed through time in such a way that the products of earlier events can transform the nature of later events.

1.5 Need For The Study

A study by Gururaj (2011) on traumatic brain injuries revealed that the road accidents in India are increased by 1.4% during 2009-10. In total, 4,15,855 road accidents were reported, that resulted in death of 1,26,896 persons with an accident severity index of 30%. The annual mortality rate was 10.9/1,00,000 population. In Bangalore 5,705 were injured and 742 were killed, in Karnataka 61,697 were injured and 8,714 were killed and in India 4,66,649 were injured and 1,26,896 were killed. Thus, TBI constitutes a major health problem which has been acknowledged recently by some authorities. For example, The World Health Organization’s (WHO’s) Task Force on Mild Traumatic Brain Injury had arrived at a conclusion, that “there is evidence that mild traumatic brain injury is an important public health problem” and that “we need more high quality research in this area” (Cassidy et al., 2004). The results of such research are also a necessary prerequisite for designing preventive, therapeutical rehabilitative and general health care measures in order to minimize the burden of this condition on the individual and on society. For these reasons, it has been a long sought goal of TBI researchers to understand if any speech and language impairments in terms of cognitive-communicative deficits are present or not after head injury. If present, the researchers’ goal can be to diagnose the condition and help develop treatment strategies that may assist these patients with cognitive-linguistic recovery.

It is well documented that individuals with TBI do not always produce proficient conversational discourse because they have difficulty in maintaining appropriate pragmatic and social skills. They may also have a difficulty producing proficient discourse due to impaired attention, planning, organization and self-regulation processes (Bond-Chapman, Levin, Matejka, Harward, & Kufera, 1995; Cherney, Shadden, & Coelho, 1998). Previous research on conversational discourse of individuals with TBI has depicted their incompetence and communication difficulties.
It is important to evaluate communication rather than linguistic knowledge in TBI because linguistic knowledge is maintained but the ability to communicate or use that knowledge to share information is affected in these individuals. Conversation and "social chat" have been recognized as the affected communication genres for individuals with TBI (Davidson, Worral, & Hickson, 2003; Larkins, Worrall, & Hickson, 2004). Conversation with individuals with TBI has been described as more effortful and less enjoyable because their partners are required to use "additional" prompting to maintain the topic and flow of conversation (Coelho, Youse, & Le, 2002). Conversational interaction between friends, parents and siblings of individuals with TBI has been occasionally included in clinical studies, and it is difficult to identify if discourse performance of individuals with TBI may be improved in the presence of people who share meaningful (social) relationships with them. But this may cause bias in choosing discourse partners and does not provide an accurate judgment of TBI individuals' discourse ability. So, discourse studies in the TBI literature have focused on "conventional" genres such as monologues, narratives, procedural texts and structured conversations to make the task more controlled from a research point of view. To check the interactional communication of everyday, conversational discourse genre has to be used. Previous investigations have demonstrated that individuals with TBI experience difficulty with communicative effectiveness across a number of discourse production genres.

The studies on bilingual children suggest that they may produce different narratives in each of their two languages (Minaya-Portella, 1980; Dart, 1992; Bayley & Pease-Alvarez, 1997; Guiterrez-Clellen, 2002; Silliman, Huntley Bahr, Brea, Hnath-Chisolm, & Mahecha, 2002). The left inferior frontal gyrus (LIFG) has been shown to respond differentially to L1 and L2 (Kim, Relkin, Lee & Hirsch, 1997). As of now, research in this area is inconclusive as to whether these differences are a matter of variation related to bilingual language proficiency, linguistic structural differences, and/or cultural differences related to the acquisition of each of the two languages and neuro-pathological conditions due to trauma. As a clinical implication it demonstrates the importance of considering the language of testing when eliciting discourse from any bilingual population and the type of the discourse genre for eliciting a productive and complex discourse. Thus, the differences can be teased apart, by determining differences existing in the different languages of different
discourse genres of bilingual adult with relatively equal proficiency in both languages. In the present study an effort has been made to study the discourse ability of individuals with TBI in their L1 (Kannada) and L2 (English) using three different discourse genres like conversation, narration and picture description. Thus, an attempt has been made to study the similarities or differences between L1 and L2 of all the participants’ discourse genres.