LINGUISTIC PROFILING OF DEVELOPMENTAL LANGUAGE DISORDERS: A REVIEW

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JUNE, 2011

DEDICATED TO

ALMIGHTY GOD

&

MY DEAR PARENTS

CERTIFICATE

This is to certify that this independent project entitled ***"Linguistic Profiling of Developmental Language Disorders: A Review"*** is the bonafide work submitted in part fulfillment for the Post Graduate Diploma in Clinical Linguistics – SLP and of the student (Registration No. 10DCL002). This has been carried out under the guidance of a faculty of this institute and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

Mysore
June, 2011

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CERTIFICATE

This is to certify that this independent project entitled "Linguistic Profiling of Development Language Disorders: A Review" has been prepared under my supervision and guidance. It is also certified that this has not been submitted earlier in any other University for award of any Diploma or Degree.

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DECLARATION

This is to certify that this Independent Project entitled ***"Linguistic Profiling of Developmental Language Disorders: A Review"*** is the result of my own study under the guidance of Dr. K.C. Shyamala, Professor, Department of Speech-Language Pathology, All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier in any other University for the award of any Diploma or Degree.

Mysore, Register No. 10DCL002

June, 2011

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"Trust in the Lord with all your heart and lean not on your own understanding; in all your ways acknowledge Him, and He will make your paths straight".

Proverbs: 3: 5, 6

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INTRODUCTION

Communication is the most essential base for 'getting along with others' and for satisfying both intra and interpersonal needs. The most sophisticated way of communication is seen in human beings who use speech. This has been evolved by modifications of very primitive use of gestures. While communicating, it is the underlying language that is externalized through speech. Thus language is the 'core' of an effective communicative process. The pattern of language development is sequential universally, unless and until interference is caused due to any sensory or motor deficits. Apart from sensory and motor deficits, the cognition also plays a very important role in language acquisition.

Developmental Disability

Developmental disability (DD) is a complex phenomenon that may affect social, behavioral, intellectual, physical, and emotional development of a child. It has significant effect on learning all kinds of skills, including language skills. Typically, this complex phenomenon includes such conditions as mental retardation, cerebral palsy, autism spectrum disorders, hearing loss and so forth. The Developmental Disabilities Assistance and Bill of Rights Act of 1984 (P.L.98-527) defines developmental disability as 'a severe chronic disability of a person which

(a) is attributable to a mental or physical impairment;

(b) is manifested before a person attains age 21;

(c) is likely to continue indefinitely;

(d) results in substantial limitations in three or more of the following areas of major life activity: (1) self-care, (2) receptive and expressive language (3) learning (4) mobility (5) self-direction (6) capacity for independent living, (7) economic self-sufficiency; and

(e) reflects the persons need for a combination and sequence of special interdisciplinary, or generic care, treatment, or other services which are of life long or extended duration and are individually planned and coordinated.

Developmental disabilities are birth defects related to a problem with how a body part or body system works. They may also be known as functional birth defects. Many of these conditions affect multiple body parts or systems (National Institute of Child Health and Human Development, 2011)

DIFFERENTIAL DIAGNOSIS

Table 1: DIFFERENTIAL DIAGNOSIS OF DEVELOPMENTAL LANGUAGE DISORDERS

Parameters	Autism	Mental Retardation	Hearing Impairment	Specific Language Impairment	Learning Disability
History	Delayed development in speech, language and social skills.	Global developmental delay	Poor response to sound stimuli.	Family history of language disability	Poor academic performance
Motor Development	Normal	Delayed	Normal	Normal	Normal
Behaviour	Aloof, self-stimulatory, self-injurious and stereotypic behaviours. Insistence on	Slowness in motor learning. Poor cognitive skills. No bizarre behaviour.	Attends to facial expression and tactile sensation. Peer rapport is good.	Low frustration tolerance. Distractible Feeling of inadequacy.	Problems in self regulatory behaviours. Distractible, and

	sameness.	Performs tasks appropriate to mental age.	Lack of confidence.		hyperactive
Auditory Component	Hypo/ hyper sensitive to certain sounds. Inconsistent response to sounds.	Inconsistent response to sounds.	Responds consistently when threshold is reached.	Inconsistent response to sound. Disturbance in auditory perception.	Poor auditory perception
Visual Component	Repeats visual cues avoidance of physical and eye contact. Do not respond to facial expression.	Sensitivity to facial expression may be reduced.	Very sensitive to visual clues. Supplements speech communication with gestures.	Limitation in comprehension of visual cues. Disturbances in reading, writing and attention to facial expression.	Issues with visual imagery, visual processing, and spatial relations.
Emotional	Withdrawn,	Associated	Normal	Emotionally	Aggressive,

Component	but may be aggressive. Lack of normal expression of emotion.	behaviour due to frustration. Realistic emotional expression.	depth of emotional tone. Emotional expression is immature but not bizarre.	immature and unstable. Lacks depth of feelings.	worried and emotionally unstable.
Social Development	Impairment in social perception and interaction. Lack of imaginative and social play.	Lack of understanding of social situation. Play lacks imagination, ideation. Average social quotient is 55.	Maintain good interpersonal relationship.	Maintain good interpersonal relationship with adults and peers. Social quotient of 75.	Struggles with proper peer interaction, nonverbal communication, and new situations.
Onset of Speech	Delayed and/or deviant.	Delayed	Delayed	Delay and deviancy may be seen.	Delayed

Response to Speech	Usually no response. Repeats others speech in a monotonous tone.	Understand simple language, little interest in stories.	Failure to understand speech.	Verbal language may be retarded.	
Articulation	Normal dyslalic inadequate development	Usually slow. Misarticulations are seen, mainly substitutions.	Defective articulation. Substitution of voice/voiceless sounds.	Misarticulations such as substitutions, deletions and cluster reductions are seen.	Mispronunciations of multi-syllabic words.
Speech and Language	Defective inner language. Electively mute, no use of gestures. Lack of communicati	Language depends on the mental age. Limited syntax and imagination seriously affected. Shift	Good inner language. Uses gestures extensively. Prosody affected. Co-	Poor inner language. Little or no use of gestures. Communication impairment.	Difficulties in detecting and manipulating phonemes. Experience word

	ve intent in speech.	in cognition process and modification.	articulation is poor.	Abnormal rhythm and speech is dysfluent.	retrieval problems. Communicatively less interactive.
Mental Capacity	Borderline low IQ but usually not severely retarded. Rote memory is good.	Generalized retardation. Poor memory and poor performance on SFB.	Average level. Discrepancy between verbal and performance scores.	Mostly normal IQ. Poor attention span and figure ground difficulties are present.	Average or above average intelligence Poor attention span and memory.
Medical Findings	NIL	NIL or consistent with syndrome if associated anomalies are present.	NIL	Paroxysmal epileptiform activity noted on overnight sleep	EEG abnormalities are present.

				recordings, not present during wakefulness	
Treatment	Environmental therapy. Parent and child to be involved in therapeutic process. Behaviour modification. Speech-language therapy.	Surgery/ corrections of associated anomalies. Speech and language therapy.	Early identification. Use of amplification device. Auditory training. Speech and language therapy.	Behaviour modification and speech, language intervention.	Speech and language therapy focusing on reading, writing, spelling, memory and mathematical skills.
Prognosis	Poor if moderate to severe retardation.	Good for mild and moderate retardation. Poor for severe to profound MR.	Good, dependent on age of identification and intervention	Fairly good	Poor prognosis

(Aram & Nation (1982); Darby (1984); LaPointe, (1990); Lees & Urwin (1997); Minifie & Lloyd (1978); Myklebust (1954) Bender (2008); Gates (2007); Mather & Goldstein (2008))

For the differential diagnosis of these developmental disorders non-linguistic parameters are also considered as shown in *table 1*.

The history of an individual with autism includes delayed development in the field of speech, language and social skills whereas that of MR includes a global delay in development. Poor response to sound stimuli is the history found in individuals with hearing impairment. An individual with SLI has a family history of language disability and for LD children poor performance in their academic skills is found.

Motor development for individuals with mental retardation is delayed whereas for autism, hearing impairment, specific language impairment and learning disability it is normal.

Behaviour problems that are seen in autism includes aloofness, self-stimulatory, self-injurious and stereotypic behaviours. They are also reluctant to change. Slowness in motor learning and poor cognitive skills are the behavioural characteristics seen in individuals with MR. They are able to perform tasks which are appropriate to their mental age and absence of any bizarre behaviour. Individuals with hearing impairment are able to attend to facial expressions and tactile sensations but they lack confidence. They are able to maintain a good rapport with the peer group. The children with SLI have a low tolerance level of frustration and also have the feeling of inadequacy. Those

children with LD have problems in self regulatory behaviours. Both, children with LD and SLI are distractible.

Inconsistent response to sound stimuli is found in children with autism, MR, HI, SLI and LD. Individuals with autism also show hyposensitivity or hypersensitivity to certain sound stimuli. HI children respond consistently when the sound stimuli reach the threshold level. Disturbance in auditory perception is seen in children with SLI and LD.

Individuals with autism do not respond to facial expression while, those with MR, SLI and LD have reduced sensitivity to facial expression. Autistic children repeat the visual cues and have lack of eye contact. HI children are very sensitive to the visual clues and they use gestures to supplement speech communication. Children with SLI and LD have limitation in comprehension of visual cues.

Emotional component of autistic and LD children reveals that they are aggressive. Autistics are withdrawn and they lack the expression of normal emotions. Individuals with MR have realistic expression of emotions. Children with HI have immature expression of emotions, but not bizarre but they become irritated at not making self understood. SLI and LD children are also emotionally immature and unstable.

There is a lack in imaginative and social play in individuals with autism and MR. Individuals with autism also have impairment in social perception and interaction whereas retarded children lacked the understanding of social situation. The average social quotient of MR children is 55 and that for SLI is 75. The children with SLI and HI maintain a good interpersonal relationship whereas children with LD struggle with proper

peer interaction. LD children also have trouble with nonverbal communication and new situations.

The onset of speech is delayed in MR, HI and LD whereas it may be delayed or deviant in autistics and SLI.

Autistic children usually show no response to speech but they repeats others speech in a monotonous tone. Individuals with retardation are able to understand only simple language and they show little interest in stories. Children with HI fail to understand speech. Verbal language of SLI children may be retarded.

Autistic children are normal dyslalic with inadequate development of articulation skills. In MR, HI, SLI and LD misarticulations are seen. MR and HI individuals mainly have substitution errors. Misarticulations such as substitutions, deletions and cluster reductions are seen in individuals with SLI whereas mispronunciations of multi-syllabic words are seen in LD.

In speech and language skills, children with autism, SLI and LD have poor inner language whereas children with HI have good inner language. Individuals with autism are electively mute and they do not use gestures. They also lack communicative intent in speech. The language of the MR depends on their mental age. They have limited syntax and imagination is seriously affected. They show shift in cognition process and modification. Children with HI use gestures extensively and their prosody is affected. Their co-articulation are also poor. SLI children use little or no use gestures and their communication is impaired. They have abnormal rhythm and their speech is dysfluent.

Children with LD have difficulties in detecting and manipulating phonemes. They experience word retrieval problems and they are communicatively less interactive.

Individuals with autism have borderline low IQ, but usually they are not severely retarded. They have good rote memory and often have remarkable learning abilities in few specific aspects. Generalized retardation is seen in individuals with MR. They have poor memory skills and poor performance on SFB. HI children have average level of intelligence but there is discrepancy between verbal and performance scores. Individuals with SLI mostly have normal IQ whereas LD children have average or above average intelligence. SLI and LD children have poor attention span and memory.

For individuals with autism and HI there are no medical findings reported, whereas in MR individuals it is consistent with syndromes if there are associated anomalies present. On overnight sleep recordings done on SLI children paroxysmal epileptiform activity was found but when awake it was not found. EEG abnormalities are present in individuals with LD.

Treatment for autistics, SLI and LD include behaviour modification therapy. Autistic individuals are given environmental therapy and parent and child are to be involved in therapeutic process. Treatment for retarded individuals includes surgery or corrections of associated anomalies. The treatment for HI consists of early identification and use of amplification device. They are also given auditory training. Speech and language therapy is a common treatment given for autistics, MR, HI, SLI and LD.

Prognosis is poor if moderate to severe retardation is seen in individuals with autism. Prognosis is good for individuals with mild and moderate MR and poor for severe

to profound MR. prognosis is good for HI individuals but it is dependent on age of identification and intervention strategies. Prognosis is fairly good for SLI and poor for LD.

Linguistic Profile

Crystal (1982) defines a profile as follows "a linguistic profile is a principled description of just those features of a person's (or group's) use of language which will enable him to be identified for a specific purpose". The use of the term "principled" implies that the linguistic data are to be analyzed according to an agreed theoretical framework, be they phonological, syntactic or of any other type.

Profiles normally consists of charts which are divided into categories (e.g. syntactic categories, or phonological units), allowing the clinician to note how many times a particular category was used and, where appropriate, whether the category was utilized correctly or otherwise. Some profiles have an added dimension to aid in the classification of patients. This has most normally been a developmental metric, whereby the patient can be assessed in terms of what level of normal linguistic development they have reached in comparison with their actual age.

In a linguistic profile, certain general principles are taken from linguistic science, and interpreted in the light of the demands of clinical practice. The intended result is a procedure which is capable of being used as a routine clinical tool, on the one hand, and as a research technique, on the other. Ideally, any profile should contain three dimensions: it should provide a comprehensive description of patient's data; it should

provide a principled grading of the data; and it should show the influences operating on patient, as he interacts with therapist, the clinical setting, the clinical materials and so on.

METHOD

The aim of this independent project in clinical linguistics is to provide a profiling of the linguistic features found in developmental disabilities. The developmental disabilities selected for this profiling includes the following:

- Autism spectrum disorders (ASD)
- Mental retardation
- Hearing loss
- Specific language impairment
- Learning disability

The information on linguistic characteristics of developmental disabilities is collected from books, journals, articles and through surfing the internet.

REVIEW OF LITERATURE

Linguistic profiling

The notion of a linguistic profile, as it has come to be used clinically in recent years, is essentially an application of the everyday concept. One major dictionary lists three relevant senses of the word 'profile':

the outline or contour of the human face, especially viewed from the side; a verbal arithmetical, or graphic summary or analysis of the history, status etc. of a process or relationship; a vivid and concisely written sketch of the life and characteristics of a person.

Elements of each of these senses are involved in constructing linguistic profiles (Crystal, 1992).

Over the last fifteen years or so, the use of linguistic profiles in the assessment of speech-language impairments has grown considerably. Profiles have been made available for a wide range of areas: for phonology, segmental and non-segmental; for dysfluency; for voice; for discourse; for pragmatics even.

The primary purpose of profile-construction is to enable an accurate assessment of patient's disability to be made, sufficient to provide a basis for remedial intervention. The aim is to generate hypotheses concerning the nature of the disability and its remediation, which it is the purpose of subsequent intervention to confirm or disconfirm. According to Crystal (1992), there are thus two main goals:

- to identify the linguistic level patient has achieved, in relation to the level he should be achieving;

- to suggest a remedial path, which will take him from where he is, to where he ought to be.

Language is a complex, multi-layered symbol system whereby aspects of the real world are realized as a series of noises produced in the human vocal tract. By multi-layered it is meant that speech sounds can be grouped into phonemes, and then into syllables; these in turn are grouped into morphemes, then words; which in turn are grouped into phrases, clauses and sentences which finally convey meaning.

Linguists have therefore approached the analysis of speech and language in terms of levels, as to do otherwise would produce analysis too complicated to read. Traditionally linguists have ordered the levels of analysis from speech through to meaning. These levels are normally termed phonetics, phonology, morphology, syntax, lexis and semantics.

Phonetics and Phonology

These two terms both refer to the sounds of language, but while they have this in common it is important not to confuse phonetics and phonology as the difference between them is not only important theoretically, but also in terms of language disorders and remediation. Whereas phonetics is the study of speech sounds irrespective of their function in language, phonology is the study of how speech sounds function in language. The study of phonology is not simply a matter of working out from phonetic data what are the phonemes of a language or indeed the phonological units used by a speaker with disordered speech. Phonologists have noted phonological processes involving whole sets of phonemes when they are found in particular environments. This can be helpful in

clinical phonology, in working out the relationship between the target sound(s) of the language and what a patient actually produces.

Morphology and Syntax

These two levels of analysis are grouped together under the term "grammar". Both levels are concerned with the structure of language: morphology with word structure, syntax with sentence structure. The main unit of word structure that is used in linguistics is the morpheme. This is usually defined as being the smallest unit of linguistic structure that is meaning bearing. Some morphemes can stand alone as single words (like "dog") and these are termed free morphemes. Others (like "ful" and "ly") can only occur when attached to other morphemes; these are termed bound morphemes. Syntax is the study of sentence structure. This is not simply the analysis of the order of words in a sentence, though it is important to know what order constituents of sentences normally occur in, and what constituents have the freedom to occur in more than one order for emphasis purposes and so on. One of the main objectives of syntax is to identify the hierarchy of constituents that a sentence is made up of. That is to find out what are the main grammatical roles in a sentence, what type of word or word-groups make up these roles, and what relations hold between them.

Lexis and Semantics

Lexis is the term linguists use to describe the study of vocabulary. The term lexeme is often encountered as alternative to the ambiguous term "word". A lexeme is a vocabulary item which encompasses all those variants brought about through the addition of inflectional affixes. Meaning is not restricted to the lexical aspects of language, however. In sentences there are not only syntactic roles, but also semantic ones. These

include roles such as actor, activity and goal, that often correspond to syntactic roles such as subject, verb and object.

Pragmatics and Sociolinguistics

It is not always easy to draw a distinction between these two areas, particularly as there are no universally accepted definitions of them. As a working distinction it can be said that whereas both pragmatics and sociolinguistics are to do with the interaction between language and extra-linguistic features, pragmatics concentrates on the interaction between social variables and speakers use of language.

Autism

Autism is a pervasive developmental disorder that varies on a spectrum of mild to profound impairment marked by disinterest in typical social interaction; severely impaired communication skills; and repetitive, stereotypical movements, combined with narrowly circumscribed, obsessive interest. The condition affects virtually every domain of a child's development, although children with autism may demonstrate some age-appropriate skills in specific areas, such as fine motor or visual-spatial skills. A few may even exhibit some isolated but extraordinary skills. It is a lifelong disability (Hegde & Maul, 2006). Autism is defined according to the presence or absence of a variety of behaviors. The Diagnostic and Statistics Manual of Mental Disorders (American Psychiatric Association, 1994) lists the following criteria for a diagnosis of autism:

- Impairment in social interaction: This would include impairment in the use of non-verbal behavior, lack of spontaneous sharing, lack of social/ emotional reciprocity, and failure to develop peer relationships;

- Impairment in communication: The child with autism typically has a delay or lack of development of spoken language and gestures, is impaired in the ability to initiate and / or maintain a conversation, lacks pretend play, and repetitive and idiosyncratic use of language;
- Restricted repertoire of activities and interest: Preoccupation with restricted patterns of interest, inflexible adherence to routines, repetitive movements, and preoccupation with parts of objects

Oftentimes, autism is not diagnosed until a child is 2.5 to 3 years of age (Sigman & Capps, 1997). Because of this, there is very little research on children with autism under the age of 2.

Phonological deficits

Verbal children with ASD can exhibit the same types of articulation and phonological disorders that other children do. Supra-segmental phonological aspects, however, are often noticeable in atypical ways. Characteristics include:

- Disordered prosody: The child's speech might sound "sing-song", monotonous, or may have an inappropriate prosody that has no apparent pattern to it at all.
- Inappropriate intensity: The child may whisper or, conversely, shout loudly for no apparent reason.
- Abnormal patterns of inflection: The child's inflection may not correspond with the meaning of the sentence; for example, the child might produce a statement with rising inflection (abnormal), instead of a question (normal) (Hegde & Maul, 2006).

Studies of the speech production of children with ASD without MR has shown that in those who develop spoken language, the course of development of phonological rules follows the same course as does that of typically developing children (Kuder, 2003; Owens, 2004). However supra-segmental features may be deviant. Children with ASD may have disturbed prosody characterized by features such as flat intonation, a high-pitched voice, a "singsong" quality, inappropriate fluctuations in intensity, and others (Roseberry- McKibbin, 2007).

Semantic difficulties

Some children with ASD may appear to have an impressive vocabulary, particularly in connection with whatever interest they may have. There are, however, often some notable deficits in the semantic aspect of language, including:

- Decreased receptive language: the children may have difficulty in following even the simplest one-step direction (e.g., "touch your nose", "clap your hands", "sit down')
- Faster learning of concrete words as opposed to abstract words: it is much easier for children with ASD to label objects than to label emotions or concepts.
- A lack of generalization of words and concepts: children with ASD tend to use words in a restricted sense and context (e.g., they may learn that a familiar toy is a ball but fail to generalize the label to any other ball- also called under-extension).
- A lack of knowledge of the associations between words: the children may know the meaning of the words *soap* and *water* but may not understand the relationship between those two words.

- Production of idiosyncratic phrases and sentences: children with ASD may create their own ways of remembering to do things or telling others what they want (e.g., one girl was reported to say "Got a splinter!" whenever she was hurt or upset) (Gilpin, 1993; Prizant & Wetherby, 1987)
- No comprehension of figurative language: proverbs, idioms and slang are likely to be taken literally (Hegde & Maul, 2006).

Children with ASD generally range from having poorly developed to very well developed vocabularies; however they may have difficulties using words appropriately in natural situations. They cannot always understand the appropriate use of words that they can define and spell (Iwanaga, Kawasaki & Tsuchida, 2000). They may also have word retrieval problems (Owens, 2004).

Syntactic and morphological difficulties

Verbal children with ASD may produce syntactic and morphological structures that are commensurate with their mental age, with some peculiarities. Characteristics include:

- Production of short, simple sentences: such productions contribute to a prosody that may sound "choppy".
- Incorrect word order: children's word combinations may be unusual (e.g., "Green is her dress", "Now back home go we!").
- Omission of grammatic morphemes: such omissions result in telegraphic, oddly inflected speech.
- Pronoun reversal: substitution of I for you, and vice versa, is a common feature. Early psychoanalysts saw it as a sign of the autistic child's extreme egocentrism.

Now, it is thought that the child's difficulty with abstract language and tendency to produce echolalic speech are more likely the cause of pronoun reversal (Hegde & Maul, 2006).

Children with autistic disorder are often delayed in acquisition of normal morphological and syntactic milestones. They may have specific difficulty with verb endings and pronouns. The sentences of children with ASD may be less complex than those of typically developing peers (Owens, 2004). However, children such as those with Asperger's syndrome, who are higher functioning, often have sophisticated morphological and syntactic skills (Frith, 2003; Mesibov et al., 2001).

Some children with more severe autism will demonstrate echolalia- repeating back what was said to them. They may repeat words immediately, or even hours or days after hearing them (Roseberry-McKibbin, 2007). Not all children with ASD present with echolalia (Schuler & Fletcher, 2002). However, many will use "prefabricated" sentences; they have a specific deficit in creating novel sentences (Schuler & Fletcher, 2002).

Pragmatic difficulties

The essential deficit of ASD is found in the pragmatic aspects of language. It is the autistic child's difficulty with social interaction and pragmatic language skills that most clearly suggest the diagnosis. Difficulties include:

- Absent or fleeting eye- gaze: this is one of the first signs of ASD.
- Lack of topic initiation: children with ASD are unlikely to seek out conversational patterns. Children with Asperger's syndrome (AS), however, are likely to insist

on initiating conversation with peers and adults when the topic is relevant to their own interest.

- Lack of topic maintenance: children with ASD may make irrelevant comments during conversation or may abruptly terminate a conversation. Children with AS maintain a topic of conversation for an inappropriately long period of time, conducting a one-sided virtual monologue regarding their favorite interest.
- Impaired conversational repair skills: both children with ASD and children with AS seem to be unaware of the needs of their conversational patterns for clarification. They do not amend their utterances to fulfill those needs and do not voluntarily seek clarification for themselves.
- Generally inappropriate speech: both children with ASD and AS may produce utterances that are inappropriate to time, place and person. For example, one Catholic family reported that their high functioning autistic son shouted out, "Touch down!" as their priest raised his hands to bless the host during Sunday Mass (Gilpin, 1993).
- Limited turn taking skills: children with ASD may interrupt with irrelevant comments and may have no sense of the give –and-take of human discourse. Children with AS in particular way may talk incessantly on a particular topic, without inviting a turn from their conversational patterns. (Hegde & Maul, 2006)

Children with ASD have deficits in intentional communication. From early on (as early as one year of age), these children may demonstrate a lack of joint attentional behaviour and may not respond to human voices. Children with ASD miss subtle social

cues- they have difficulty interpreting what others are thinking (Roseberry-McKibbin, 2007).

Sometimes students with ASD talk a lot with seemingly good vocabulary and sentence structure, but their communication is inappropriate to the situation (Westby & McKellar, 2000). They often have difficulty regulating their emotions.

Table 2: Linguistic profiling for individuals with autism

Phonology	• Disturbed prosody characterized by features such as flat intonation, a high- pitched voice, a "singsong" quality, inappropriate fluctuations in intensity, and others. • Inappropriate intensity: Whisper or, conversely, shout loudly for no apparent reason. • Abnormal patterns of inflection: The child's inflection may not correspond with the meaning of the sentence. • Development of phonological rules follows the same course as does that of typically developing children.
Semantics	• Decreased receptive language: The children may have difficulty in following even the simplest one-step direction. • Faster learning of concrete words as opposed to abstract words. • A lack of generalization of words and concepts.

	• A lack of knowledge of the associations between words: the children may know the meaning of the words *soap* and *water* but may not understand the relationship between those two words. • Production of idiosyncratic phrases and sentences: children with ASD may create their own ways of remembering to do things or telling others what they want. • No comprehension of figurative language: proverbs, idioms and slang are likely to be taken literally. • Also have word retrieval problems.
Syntax and Morphology	• Delayed in acquisition of normal morphological and syntactic milestones • Production of short, simple sentences • Incorrect word order: children's word combinations may be unusual (e.g., "Green is her dress", "Now back home go we!"). • Omission of grammatic morphemes: such omissions result in telegraphic, oddly inflected speech. • Pronoun reversal: substitution of I for you, and vice versa, is a common feature. • Morphological difficulties, especially with pronouns and verb endings

	• Less complex sentences than mental- age- matched peers developing typically. • Children with severe autism will demonstrate echolalia- repeating back what was said to them. • They have a specific deficit in creating novel sentences.
Pragmatics	• Children with ASD have deficits in intentional communication. • Absent or fleeting eye- gaze: this is one of the first signs of ASD. • Lack of topic initiation: children with ASD are unlikely to seek out conversational patterns. • Lack of topic maintenance: children with ASD may make irrelevant comments during conversation or may abruptly terminate a conversation. • Impaired conversational repair skills: They do not amend their utterances to fulfill those needs and do not voluntarily seek clarification for themselves. • Generally inappropriate speech: children with ASD may produce utterances that are inappropriate to time, place and person. • Limited turn taking skills: children with ASD may interrupt with irrelevant comments and may have no

	sense of the give-and-take of human discourse. • They often have difficulty regulating their emotions. • Children with ASD miss subtle social cues- they have difficulty interpreting what others are thinking.

Mental Retardation

The American Association on Mental Retardation (AAMR, 2002) defined mental retardation as follows:

Mental retardation is a disability characterized by significant limitations both in intellectual functioning and adaptive behaviour as expressed in conceptual, social, and practical adaptive skills. This disability originates before the age of 18…. Mental retardation refers to a particular state of functioning that begins in childhood, has many dimensions, and is affected positively by individualized supports…. It includes the contexts and environment within which the person functions and interacts…. Mental retardation is thought to be present if an individual has an IQ test score of approximately 70 or below.

The capacity to develop speech and language is an innate capacity of the human brain. When the brain is impaired in the areas responsible for language development, the capacity for language is also impaired. If the physical appearance is normal, the mentally retarded children are more likely to reveal himself by poor speech and language than by any other single deficiency.

Phonological difficulties

Children with MR frequently have consonant substitutions and distortions. Common characteristics include simplification of consonant clusters and especially final consonant deletion (Roseberry-McKibbin, 2007). In a study of the phonology of 40 adults with MR, Shriberg and Widder (1990) reported the following characteristics:

- High rate of deletions which include final consonant deletions, cluster simplifications and syllable deletions
- Presence of vowel errors

Sommers, Reinhart and Sistrunk (1988) reported that among the phonological errors evidenced by DS children ages 13 to 22 years, some were phonemes frequently seen in error in 5- and 6-year- olds (i.e., /r/, of normal intelligence /r/ clusters, /s/, /s/ clusters, /z/, /v/). The authors indicated that these errors would appear to support the assertion that the phonological development of children with DS follows the same general pattern as that of normal children. They also reported that DS children evidenced errors not typically seen in normal 5- and 6- years- olds (i.e., deletion of alveolar stops and nasals).

Sommers, Patterson and Wildgen (1988) reported that their DS subjects, ages 13 to 22, evidenced a combination of delayed and deviant phonology. Evidence of delayed phonology was reflected in final consonant deletions, cluster reductions, gliding of liquids, and vocalizations; simplification processes frequently observed in the speech of young children.

Morphological and Syntactic difficulties

The traditional belief has been that language of the mentally retarded developed in slow motion. Some researchers have also noted qualitative differences in the language used by the mentally retarded. Their use of morphemes differ (Menyuk, 1971) and as mental age increased, some differences are also observed in the use of inflectional forms (Schiefelbusch, 1972). Commonly, children with MR omit bound morphemes such as *–s*, present progressive *–ing*, past tense *–ed*, and others.

Research suggests that initially, children with MR develop syntactic skills in the same sequence as typically developing children. However, there is probably a plateau. Children with MR tend to have simplified sentence structure with frequent use of compound and complex sentences. Children with MR learn grammatical morphemes in approximately the same sequence as their typically developing peers; however, they learn these morphemes more slowly. Children with MR may have telegraphic speech i.e., they tend to omit function words out of the sentences and only include content words (Roseberry-McKibbin, 2007). Children with MR have difficulty with receptive syntactic abilities also; it is challenging for them to understand long and complex sentences.

Semantic difficulties

Children with MR are later to acquire their first words than typically developing children. Vocabulary of children with MR is smaller and more concrete than those of typically developing children. Abstract words present a great deal of difficulty for most children with MR. In addition, children with MR use many more nouns than verbs or

adjectives (Roseberry- McKibbin, 2007). Ryan (1977) found that vocabulary improved more quickly than did the grammar in the retarded.

A study of semantics (Semmel, Barrett & Binnett, 1970) indicated that when retarded and normal subjects of the same mental age are compared on the word-association tasks, the retarded fail to shift from synonyms to antonyms at the same mental ages as the normal. This indicates a deviance in language development.

Apart from this the striking characteristic shown by the majority of the mentally retarded children is their use of concrete language. They show paucity of ideas, lack of abstract thinking and irrelevancy of ideas. Frequently, words and sentences are introduced haphazardly with no relation to the subject matter of the conversation.

Pragmatic difficulties

Children with MR have a variety of difficulties in assertiveness and responsiveness, depending on the cause and the extent of the MR. Some children may be physically aggressive, especially if they are frustrated or if they want something and don't have the linguistic ability to ask for it appropriately.

In general, evidence seems to indicate that MR children have a tendency to be passive. They often do not initiate conversations. Topic maintenance is an area of difficulty for children with MR. They may not extend a conversational topic by adding new information; instead, they may just say "uh hum" (Kuder, 2003). These children also have difficulty with conversational repair in terms of requesting clarification. Children with MR frequently demonstrate perseveration, or excessive talking about a subject that has been previously addressed or is inappropriate. Children with MR have more difficulty

than typically developing children in judging the nonverbal emotions of their communication partners and may inadvertently offend them.

Table 3: Linguistic profiling for individuals with mental retardation

Phonology	• The development of phonology in MR is delayed and deviant • Frequently have consonant substitutions and distortions. • Simplification of consonant clusters and final consonant deletion is present • Presence of vowel errors • Individuals with DS have perceptually and acoustically distinct prosody • In DS children phonological development follows the same pattern as that of normal children • Deletion of alveolar stops and nasals are also present
Semantics	• Children with MR are later to acquire their first words. • The vocabularies of children with

	MR are smaller and more concrete. • Abstract words present a great deal of difficulty for most children with MR. • Children with MR use many more nouns than verbs or adjectives. • Vocabulary improved more quickly than did the grammar in the retarded. • Paucity of ideas, lack of abstract thinking and irrelevancy of ideas are seen in MR population
Syntax and Morphology	• Rate of acquisition is slow • Difference observed in the use of inflectional forms • Omit bound morphemes such as *–s*, present progressive *–ing*, past tense *–ed*, and others • Develop syntactic skills in the same sequence as typically developing children. • Have simplified sentence structure with frequent use of compound and

	complex sentences. • Children with MR learn grammatical morphemes in approximately the same sequence as their typically developing peers • Children with MR may have telegraphic speech • Have difficulty with receptive syntactic abilities • Difficult to understand long and complex sentences
Pragmatics	• Have a variety of difficulties in assertiveness and responsiveness, depending on the cause and the extent of the MR. • Some children may be physically aggressive • MR children have a tendency to be passive. • They often do not initiate conversations.

	• Lack of topic maintenance • They may not extend a conversational topic by adding new information • Also have difficulty with conversational repair in terms of requesting clarification • Children with MR frequently demonstrate perseveration, or excessive talking about a subject that has been previously addressed or is inappropriate. • Difficulty in judging the nonverbal emotions of their communication partners

Hearing Impairment

Hearing impairment can be very mild, creating few problems with communication. It can also be severe to profound, causing major communication problems. The term hearing impaired refers to the condition of being deaf or hard of hearing. The child who is hard of hearing has a loss between 16 and 75 dB; children who are hard of hearing acquire oral language and speech with variable proficiency. Children who are deaf are those who can't hear or understand conversational speech under normal

circumstances. Their hearing loss is greater than 75 dB and in many cases is greater than 90 dB (Roseberry-McKibbin & Hegde, 2006).

Major factors contributing to the course of language development in children with hearing impairment include: the age at which the hearing loss was identified, the severity of the hearing loss, in some cases etiology of the hearing loss, when and how hearing amplification devices are used, the presence of other medical conditions, and the nature of the communication environment provided (Schwartz, 2009). Hearing loss in children does not produce a unique type of oral language disorder. With minor variations, these children tend to make the same errors as those without hearing loss (Hegde & Maul, 2006)

Phonological difficulties

The general pattern of acquisition are also roughly characteristic of hearing impaired (HI) children who are getting auditory benefit from well-fit hearing aids (HA) or cochlear implants (CI), although the rate of acquisition is typically slower on average (Serry & Blamey, 1999). A study done by Hudgins & Numbers (1942) reported on the speech production of 192 students in oral schools for the HI, ranging in age from 8 to 20 years. They reported that although children with various degrees of loss were likely to exhibit cluster reductions, consonant substitutions, and syllable- final consonant deletions, children with profound losses were also likely to produce consonants that evidenced voicing errors and extra nasality and to omit syllable-initial consonants. These latter students also tended to display loss of vowel quality, atypical diphthongizations,

and nasality in their vowel sounds. Substitution of nasal sounds with stops was another reported common error atypical of a hearing child.

Studies of younger HI children have noted large proportions of omitted segments and relatively better production of consonants produced with frontal and more visible places of articulation even when non-imitative tasks are used (Geffner, 1980). Recent research has also noted that the speech of HI children often contains sounds that are not part of the usual sound system of the ambient language. Chin (2003), in examining the phonological systems of 12 school-age American children using CIs, found that in addition to missing ambient phonemes, many children produced "additional" non-ambient stop consonants, which in some cases replaced native fricative sounds.

Consonant production in HI children is generally characterized by deletions and substitutions. Both initial and final consonant deletions occur; however final consonant deletions are more prevalent (Abraham, 1989). Frequently occurring substitutions include (1) confusion of voiced and voiceless cognates, (2) substitution of stops for fricatives and liquids, and (3) confusion between oral and nasal consonants (Levitt and Stromberg, 1983). Studies with hard-of-hearing children have reported that consonants produced with the blade of the tongue (e.g., t, d, s) are more likely to be in error. The affricates are ranked as most difficult for both profoundly hearing impaired children and the hard of hearing (Markides, 1970; Smith, 1975).

Children with HI have been found to use atleast partially rule governed phonological systems (Abraham, 1989; Dodd, 1976). They use phonological processes similar to those of young normally developing children, although they use these

processes more frequently. The overall intelligibility of speech is often reduced, particularly as linguistic complexity increases (Radziewicz & Antonellis, 1997).

Vowels tend to be neutralized; therefore, front and back vowels have a tendency to sound like central vowels (Ling, 1976). Other vowel errors include tense for lax (and lax for tense) substitutions, especially the front vowels [i] and [I]. Due to poor control of timing, diphthongs are often produced as monothongs and vice versa (Levitt & Stromberg, 1983). Levitt & Stromberg (1983) observed the following vowel patterns in individuals with hearing loss: (1) a number of vowel substitutions, (2) substitution of diphthongs for vowels (diphthongization) and vowels for diphthongs, (3) some omissions of the intended vowel or diphthong, and (4) schwa or schwa-like vowel substitutions (neutralization).

Semantic difficulties

One of the most compelling aspects of language acquisition in NH children is the apparent ease with which new words are added to their vocabularies. This process has been studied using structured experimental situations in which children are exposed to novel words labeling new objects, actions or attributes, and memory for these novel words is then tested. A small number of analogous studies have been carried out with HI school-age children. Children with hearing loss do not learn new words as fast as those with normal hearing (Hegde & Maul, 2006).

Gilbertson and Kamhi (1995) compared the word-learning performance of 7-to 10-year-old children with mild-to-moderate hearing losses using amplification to that of younger normal hearing children matched on receptive vocabulary. The HI children

tended less often to correctly label trained referents after an initial exposure, and they took more trials to attain exactly correct novel word production. The HI children were also less likely than the normal hearing children to correctly recognize correct and incorrect labelings using the new words, particularly for the multi-syllabic novel words.

In order to study the mapping skill, Houston et al., (2005) assessed the ability of children 2 to 5 years of age using CIs, to learn associations between already-familiar adjectives/ attribute words used as proper names, and small stuffed animal toys (e.g., "Fuzzy" the Bear). After a play session used to train the associations, children were tested on their ability to select the correct referent when given the name, and to produce the name, given the referent. The children with CIs did more poorly on average than NH children of the same age.

Children with hearing loss tend to have difficulty understanding the meaning of unusual words, abstract words, and multiple meanings of words. They have difficulty understanding proverbs, simile, irony, slang, and other forms of language usage; they may interpret proverbs and slang expressions literally (Hegde & Maul, 2006)

Syntax and Morphological difficulties

Mean length of utterance (MLU) is a primary measure used to study early grammatical development. Several studies have looked at changes in MLU in HI children as a function of age. Although individual differences among normal hearing children are large, one point of reference is that normal hearing children take, on average, about a year to progress from an MLU of 1.0 to an MLU of 3.0 (Miller & Chapman, 1981). On average, an MLU of 3.0 is reached by a normal hearing child by 2.5- 3 years of age. HI

toddlers and preschoolers acquiring spoken language tend to display shorter MLUs and make slower gains in MLU, on average, than do normal hearing age-mates (Ramkalawan & Davis, 1992).

Geffner (1987) in a study of 50 6-year old children with losses of greater than 80 dB, reported that the mean MLU of the group was approximately 2 words in length, and that only 14% of the sample displayed MLUs (in words) greater than 3.0. These results indicate several years of delay relative to normal hearing children.

Children with hearing loss tend to omit grammatic morphemes including the plural and possessive inflections, the present progressive *–ing*, tense markers, auxiliaries and copulas, conjunctions, and prepositions; many of these are perhaps not predominant (e.g., the plural *–s* may be produced softly) in speech, and therefore, the children with reduced hearing acuity do not hear them. Present progressive *–ing* may be somewhat easier for them to learn than other grammatic morphemes. Consequently, their speech consists mostly of nouns, giving it a telegraphic quality.

Verbs are also difficult for children with hearing loss. Missing present progressive *–ing*, regular past tense inflections, and so forth make their verb usage inappropriate. The children may have a pronounced difficulty with tense inflections and the third person singular present tense inflection as in *walks* or *reads.*

Syntactic structures that are difficult to learn for hearing children also are difficult- only to a greater extent- for children with hearing loss. Children with hearing loss tend to produce relatively simple sentences. Production of complex, compound, and embedded sentences may be limited. Passive sentences (e.g., “The ball was hit by the

boy.") and negative passives (e.g., "The ball was not hit by the boy.") are especially difficult as are clauses that are embedded (e.g., "the girl who could not see still scored very high."). The present perfect tense also is especially difficult for children with reduced hearing acuity.

Pragmatic difficulties

Children with hearing loss generally do well on certain pragmatic language skills while showing deficiencies in others. Verbal expressions of these children may include gesture, facial expressions, vocalizations, and formal or informal signs as those of hearing children. Children with hearing loss take conversational turns well and maintain conversation. Nonetheless, these children may have difficulty initiating conversation and responding appropriately to requests for clarification when listeners fail to understand them. In response to such requests, children tend to repeat what they just said, instead of modifying their expressions (Most, 2002).

Table 4: Linguistic profiling for individuals with hearing impairment

Phonology	• Rate of acquisition is slow • HI children exhibit cluster reductions, consonant substitutions and syllable-final consonant deletions • Consonants are produced with voicing errors and extra nasality and

	omit syllable-initial consonants • Loss of vowel quality, atypical diphthongization, and nasality in vowel sounds are also present • A common error seen is substitution of nasal sounds with stops • Omission of segments • Consonants with frontal and more visible places of articulation are produced better • Consonant production is characterized by deletion and substitution • Both initial and final consonant deletion occur • Consonants produced with the blade of the tongue are more in error in hard-of-hearing • Affricates are most difficult for profound HI and hard-of-hearing children • Speech of HI also contains sounds that are not part of the usual sound

	system of the ambient language • Phonological processes used are similar to young normally developing children but are used more frequently by HI • Overall intelligibility is reduced • Vowels tend to be neutralized • Vowel errors include tense for lax substitutions • Diphthongs are produced as monothongs and vice versa
Semantics	• Generally limited vocabulary • Vocabulary may be limited to simpler words • Poor comprehension of word meanings, especially complex or infrequently used words • Lack of understanding of multiple meaning of words
Syntax and Morphology	• Incorrect production of the irregular plural and past tense forms • Difficulty understanding and producing complex, compound and

	embedded sentences • Shorter sentences; non-English word order • Limited syntactic variety; speech may consist mostly of subject-verb-object constructions
Pragmatics	• Reluctance to speak • Limited oral communication • Lack of elaborated speech • Insufficient background information • Occasional irrelevance of speech • Improper linguistic stress patterns • Difficulty with conversational repair strategies • Inadequate or inappropriate conversational skills including topic initiation, topic maintenance, and conversation closing conventions

Specific Language Impairment

Specific language impairment (SLI) is defined as language impairment that exists in the absence of other clearly identifiable problems such as hearing impairment, autism,

or intellectual disability. On the surface, the child with SLI appears to be normal, except for his language acquisition, which does not match that of his peers (Reeds, 2005).

The classification system of Rapin and Allen (1988) speculated that six possible grouping for children with SLI might better describe the diversity of disorder.

- Phonologic-syntactic deficit syndrome: Utterances are short and grammatically incorrect, with omission of functional words and grammatical inflections. Speech articulation is deficient. Word-finding problems are frequent. Comprehension is variable; there may be difficulty in understanding complex utterances and abstract language. Speech onset is much delayed.
- Lexical-syntactic deficit syndrome: Children have word finding problems and difficulty putting their ideas into words. Spontaneous language is superior to language constrained by the demands of conversation or answering questions. Syntax is immature rather than deviant. Production of speech sounds is normal. Comprehension of complex sentences is poor. Onset of speech is usually delayed.
- Verbal auditory agnosia: Children understand little or nothing of what they hear because they are unable to decode language at the phonological level. Speech is absent or very limited with poor articulation. This syndrome occurs in epileptic aphasia and may be associated with clear EEG abnormalities.
- Verbal dyspraxia: Comprehension is adequate, but speech is extremely limited, with impaired production of speech sounds and short utterances. There may be signs of oromotor dyspraxia. Some children develop a rich gestural language and profit from learning signs and reading. Speech onset is much delayed.

- Phonological-programming deficit syndrome: Comprehension is adequate. The child speaks fluently in fairly long utterances, but speech is hard to understand. Sentence structure is generally good, but grammatic markers may be omitted. Speech onset can be either normal or delayed.
- Semantic-pragmatic deficit syndrome: Children speak in fluent and well-formed utterances with adequate articulation. However, the content of language is bizarre and the child may be echolalic or use over learned scripts. Comprehension may be over-literal, or the child may respond to just one or two words in a sentence. Language use is odd, and the child may chatter incessantly or produce language without apparently understanding it. The child is poor at turn taking in conversation and maintaining a topic.

Phonological disorders

When children are diagnosed with SLI, they are likely to exhibit phonological disorder as well. Patterned errors of articulation are typically described as phonological disorders. Phonological patterns involve simplified productions of phonemes in syllables and words that most children learning to speak their language normally exhibit. As their speech and language skills improve, these phonological processes disappear. Children with a phonological disorder produce unintelligible speech characterized by predictable patterns of errors that persist beyond the time when they normally disappear in other children. If such productions persist, however, particularly beyond the age of 5, the child might be diagnosed with a phonological disorder, a difficulty in acquiring the correct production of the sounds of a language (Hegde & Maul, 2006).

Leonard (1998) has stated that phonological processes evident in children with SLI are similar to those of typically developing children with some notable differences. Prevocalic voicing and deletion of word- initial weak syllables may occur with greater frequency among children with SLI (e.g., /dap/ for /tap/). Also, children with SLI might produce unusual errors (e.g., stopping of liquids as in t/r or substituting liquids for glides as in l/w) not associated with common phonological processes (Leonard & Leonard, 1985).

Semantics

A child's difficulty learning words and their meanings is often the first sign of a specific language disorder. Children with SLI may be slow to acquire their first few words, a milestone typically achieved between 12 to 18 months of age. These children, then, may not display the explosive increase in the acquisition of new words typically of children between the ages of 18 and 24 months (Hegde & Maul, 2006).

Some studies suggest that at age 2, normally developing children have a vocabulary of 200 or more words, whereas those who may be later diagnosed with SLI have a severely restricted vocabulary of about 200 words (Paul, 1966; Rescorla, Roberts & Dahlsgaard, 1997). Children with SLI may also persist in overextending and underextending word meanings beyond the age of 3 years (Nelson, 1993).

Most toddlers learn first to label concrete objects so that nouns dominate their vocabulary. Typically, children learn verbs next, and then around the age of 2 years, they begin to produce the first two-word combinations which consist of nouns + verbs. Children with SLI acquire these early appearing word combinations, but often at a later

time and at a slower pace than normal. Also, children with SLI may not learn as quickly as typically developing children do that two- word combinations convey a variety of meanings beyond the noun + verb constructions (e.g., "Kitty run"), such as possession ("My Kitty"), disappearance ("Kitty gone"), or rejection ("No, kitty!").

Lahey and Edwards (1999) found that when compared to typically developing children, school-aged children (aged 4.3- 9.7) with SLI make more errors in naming pictures of common objects. Typically, as their language skills expand, children learn words with abstract meanings. Children with SLI, on the other hand, may have difficulty with understanding abstract concepts. Children with SLI may not understand or produce words expressing such concepts as size, shape, color, quantity, and quality as readily as do typically developing children. Their language may typically be limited to concrete events and objects.

As the child with SLI grows, a decreased vocabulary may interfere with academic performance and socialization. As academic demands for a more extensive and abstract vocabulary increase, children with SLI may appear to have word- finding problems. They know the word; they just can't think of it when they need it. Lack of specific word knowledge may also impair speech fluency, resulting in an increase in such dysfluencies as pauses, interjections and repetitions. Due to their difficulties in abstract language, they may not understand or produce metaphors, similes, idioms and proverbs (Hegde & Maul, 2006).

Studies have shown that SLI children particularly have trouble learning new action words, or verbs (Alt, Plante & Creusere, 2004; Brackenbury & Pye, 2005). Fast

mapping, or the ability to learn a word based on one or two exposures to it, is also a challenge for SLI children. Gray (2003) found that some children with SLI, in order to learn new words, may require twice the practice opportunities and exposures that their typically developing peers do.

Syntactic and Morphological problems

A striking diagnostic feature of children with SLI is their deficiencies in grammar, including syntactic and morphologic deficiencies (Conti-Ramsden & Jones, 1997; Rescorla & Lee, 2001). Generally, children with SLI speak in shorter, less complex and less varied sentences. Their productions tend to omit various grammatic morphemes, although the sequence of learning them is the same as in normally developing children. Children with SLI take more time to learn the grammatic morphemes or may continue to omit them (Hegde & Maul, 2006).

The limited syntactic skills of children with SLI result in less varied and generally limited repertoire of communication. Children with SLI are less likely to use restrictive embedded clauses (e.g., "The man *with the big suitcase* ran to catch the plane") and to manipulate, or transform, sentence structure to produce a variety of sentence types. These children may have difficulty moving from passive to active voice or changing a statement into a question. Function words, which include such grammatic morphemes as articles, prepositions, and conjunctions may be omitted, resulting in telegraphic speech, a typed of condensed speech in which only essential words are used (Hegde & Maul, 2006). SLI children use complex sentences as well as transformations less frequently than typically developing peers. Many SLI children use mostly simple, declarative sentences. SLI

children have difficulty understanding as well as using longer and more complex sentences (Roseberry-McKibbin, 2007).

According to Hegde & Maul (2006) morphological problems are especially marked in children with SLI, who are either slow in learning the following morphological features or may never learn to use some of them without intervention:

- *Regular plural morpheme and its allomorphic variations* (e.g., /s/, /z/ and /ez/ variations). Although children with SLI are slower than the normally developing children in learning plural inflections, they still master them more easily than they do main verbs, auxiliary, copula, and tense inflections.
- *Possessive morpheme*. Allomorphic variations of the possessive morpheme (e.g., Cat's tail and Mom's bag), though generally delayed, may be less difficult than different classes of verbs for children with SLI to learn.
- *Present progressive-* ing. Production of verb + ing is generally delayed in acquisition. This one aspect of verb inflection may be less difficult to learn than some of the other morphological skills, especially other aspects of verb inflections.
- *Third person singular* (e.g., "He play ball" for "He play*s* ball"). This morpheme is especially difficult for children with SLI to learn.
- *Various forms of auxiliary.* These are also especially difficult for children with SLI to learn. For example, auxiliary *is* (e.g., "He playing ball" for "He *is* playing ball"), auxiliary *are* (e.g., "They running" for "They *are* running") and their past-tense forms (*was* and *were*) may need systematic treatment before the children learn to produce them correctly.

- *Various forms of copula.* Especially difficult for children with SLI to learn are the copula *is* (e.g., "Daddy big" instead of "Daddy *is* big"), *are* (e.g., "They nice" for "They *are* nice"), and their past- tense forms (*was* and *were*). They also may need systematic treatment.
- *Tense inflections.* Another especially difficult morphological feature for children with SLI to master. Tense inflections, including the regular past tense *–ed* (as in *painted*), /t/ (as in *walked*), and /d/ (as in *begged*) may require systematic treatment.
- *Irregular plural forms.* Children with SLI may overgeneralize regular plural inflection to irregular words (e.g., *foots* for *feet*).
- *Irregular past tense verb forms.* Children with SLI may overgeneralize regular past tense inflection to irregular verbs (e.g., *goed* for *went*).
- *Distinction between the singular and plural forms of words.* Children with SLI may be confused about this distinction.
- *Distinction between the singular and plural forms of auxiliary and copula is* (e.g., *is/are; was/were*). Once again, the children may be confused about this distinction.
- *Subject case markings* (e.g., "Him go fast!" "Her pretty!"). Another difficult grammatic production for children with SLI to master.

Pragmatic problems

It is often stated that children with SLI have better pragmatic language skills than syntactic or morphological skills. Evidence on the pragmatic skills of children with SLI, however, is not consistent. In his review of studies on pragmatic language skills of

children with SLI, Leonard (1998) found contradictory evidence for almost every pragmatic language skill that has been researched. Some studies have indicated that there is little difference between the pragmatic language skills of children with SLI and other control groups. Various studies have shown that children with SLI initiate conversations, use appropriate turn taking skills, respond to requests for clarification, and make requests for clarification (Craig & Evans, 1989; Fujiki & Brinton, 1991).

Several other studies have established significant differences between the pragmatic language skills of children with SLI and those of typically developing peers. Paul (1991) found that toddlers with SLI exhibited fewer interactions involving joint attention with their caregivers. There has been some evidence that children with SLI are more likely to initiate conversation with adults than they are with peers, whereas typically developing children are more likely to initiate conversation with peers (Rice, Sell, & Hadley, 1991).

Children with SLI have more difficulty with social interactions in the context of group communication as opposed to one-on-one, or dyadic, communicative interactions. When groups of peers hold social discourse, children with SLI may not "break into" the conversation (Craig, 1993). The pragmatic deficits seen in children with SLI include:

- *Fewer comments on events and persons*. Language may be generally sparse, limited in both quality and variety.
- *Difficulty in describing events, pictures, and other stimuli*. Limited or poor descriptions and repetition of a few basic descriptive terms may be the dominant characteristic of language.

- *Interactions that are limited to answering questions asked*. Children with SLI may respond to questions, but may not offer additional information and ask questions.
- *Limited use of gestures*. Various nonverbal means of communication that accompany verbal expressions may be absent or limited.
- *Passivity in conversational interactions*. Especially in group interactions, children with SLI may be passive. They may not make attempts to interject, offer quick comments, raise questions, or narrate their own experiences.
- *Inappropriate turn taking*. Children with SLI may inappropriately interrupt speakers and fail to respond when it is their turn to speak in conversation.
- *Difficulty in initiating conversation*. Children with SLI may be either slow or deficient in initiating conversation on new topics.
- *Difficulty in sustaining topics of conversation*. Children with SLI may switch topics abruptly as they may not have enough information or language skills to sustain extended conversation on topics on which typically someone else will have initiated conversation.
- *Production of irrelevant comments*. Although seen less frequently than in children with autism or developmental disability, children with SLI may on occasion make irrelevant or inappropriate comments during conversation.
- *Deficient conversational repair strategies*. Children with SLI may fail to ask for clarification when they do not understand others. These children may also fail to respond differently when others request clarification of their own messages.
- *Deficient narrative skills*. Limited vocabulary, syntax and morphologic features can be expected to affect the narrative skills of children with SLI. Their narration

of stories or personal experiences may be brief, lacking in details, and limited to few concrete aspects of their experience or stimuli to which they respond. Chronological sequence and logical progression may be poor. Information typically inferred from stories may be missing.

- *Poor social and peer interactions*. Social and peer interactions of children with SLI may be limited to a few contacts. They may be more willing to talk to adults than to their peers.

Table 5: Linguistic profiling for individuals with specific language impairment

Phonology	• Prevocalic voicing and deletion of word- initial weak syllables occur with greater frequency • Children with SLI might produce unusual errors such as stopping of liquids as in t/r or substituting liquids for glides as in l/w
Semantics	• Difficulty learning words and their meanings is often the first sign of a specific language disorder • Children with SLI may be slow to acquire their first few words • Overextension and under extension of word meanings persist beyond

	the age of 3 years • SLI children acquire noun and verb combinations, but often at a later time and at a slower pace than normal. • Children with SLI may not learn quickly that two- word combinations convey a variety of meanings • They may have difficulty with understanding abstract concepts. • They may not understand or produce words expressing such concepts as size, shape, color, quantity, and quality • Their language may typically be limited to concrete events and objects • Their decreased vocabulary may interfere with academic performance and socialization • Children with SLI may appear to have word- finding problems

	• They may not understand or produce metaphors, similes, idioms and proverbs • They have trouble learning new action words, or verbs • Fast mapping, or the ability to learn a word based on one or two exposures to it, is a challenge for SLI children
Syntax and Morphology	• A striking diagnostic feature of children with SLI is their deficiencies in grammar • Children with SLI speak in shorter, less complex and less varied sentences • Their productions tend to omit various grammatic morphemes • Children with SLI take more time to learn the grammatic morphemes or may continue to omit them • They are less likely to use restrictive embedded clauses and to manipulate, or transform, sentence

	structure to produce a variety of sentence types. • These children may have difficulty moving from passive to active voice or changing a statement into a question. • Function words may be omitted, resulting in telegraphic speech • SLI children use complex sentences as well as transformations less frequently • Regular plural morpheme and its allomorphic variations are mastered more easily than they do main verbs, auxiliary, copula, and tense inflections • Allomorphic variations of the possessive morphemes are generally delayed • Present progressive- ing is generally delayed in acquisition • Third person singular morpheme is especially difficult for children with

	SLI to learn. • Various forms of auxiliary are also difficult for children with SLI to learn • Various forms of copula and their past tense forms require systematic treatment before they acquire them • Tense inflections, including the regular past tense *–ed* (as in *painted*), /t/ (as in *walked*), and /d/ (as in *begged*) may require systematic treatment • Children with SLI may overgeneralize regular plural inflections to irregular words • Children with SLI may overgeneralize regular past tense inflection to irregular verbs • Children with SLI may be confused about distinction between singular and plural forms • Subject case markings are another difficult grammatic production for

	children with SLI to master
Pragmatics	• Language may be generally sparse, limited in both quality and variety. • Difficulty in describing events, pictures, and other stimuli • Interactions that are limited to answering questions asked • Various nonverbal means of communication that accompany verbal expressions may be absent or limited. • Passivity in conversational interactions: Especially in group interactions, children with SLI may be passive • Inappropriate turn taking • Difficulty in initiating conversation • Difficulty in sustaining topics of conversation • Production of irrelevant or inappropriate comments • Deficient conversational repair strategies

	• Deficient narrative skills Their narration of stories or personal experiences may be brief, lacking in details, and limited to few concrete aspects of their experience or stimuli to which they respond. • Chronological sequence and logical progression may be poor • Information typically inferred from stories may be missing. • Poor social and peer interactions

Learning Disability

Woolfolk (2004) summarizes the term learning disability (LD) as describing a student who 1) has normal hearing and vision, 2) does not have emotional problems, mental retardation or educational disadvantages, and yet 3) struggles with writing, spelling, and reading. According to the National Joint Committee on Learning Disabilities (1997): Learning Disabilities is a general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical skills. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. Problems in self- regulatory behaviors, social

perception and social interaction may exist with learning disabilities but do not, by themselves, constitute a learning disability.

Phonology

Within the last decade, a great deal of research has demonstrated that students with LD have difficulties in detecting and manipulating phonemes (Bender & Larkin, 2003). Difficulties in phoneme awareness and phoneme manipulation skills may be the foundational cause of almost all subsequent LD (Bender & Larkin, 2003). If a child with LD cannot detect differences in speech sounds, that child will experience a significant deficit when trying to detect different sounds that are represented by different letters. Difficulty in such letter interpretation can result in significant reading disabilities (Bender, 2008).

Researchers in LD have used the term phonemic awareness or phonemic manipulation to represent the ability to detect and manipulate discrete speech sounds, independent of manipulation of letters. Many research efforts have investigated phonemic problems as the primary basis for learning disabilities. Bender & Larkin (2003) specified 10 skills that serve as the basis for phonemic manipulation, which is an area of deficit in children with LD: detecting rhyming sounds, recognizing the same initial sound in words, isolating initial sounds, categorizing onset and rimes, isolating middle/ ending sounds, blending sounds into words, segmenting or dividing sounds within words and phoneme addition, deletion and substitution.

Syntax and Morphology

With regard to grammatical skills, there appear to be two broad subgroups of LD students: 1) those who do not have grammatical problems and 2) those who do. With regard to the first group, recent research has suggested that students with LD with higher IQs may not have clinically significant grammatical problems (Scott & Windsor, 2000). However, many other students with LD do manifest difficulties with grammar in the areas of syntax and morphology.

Some LD students may produce less syntactically complex sentences than same-age typically developing peers (Hallahan et al., 2005; Kuder, 2003). They may also make more grammatical errors than typically developing peers. Comprehension of syntactically complex sentences is also problematic (Seidenberg, 2002). Many students with LD have trouble understanding sentences that use negation, that use the passive voice and that use relative clauses (Kuder, 2003).

Morphological skills are frequently impaired in students with LD. Students with LD experience difficulty with parts of words that are hard to hear, such as unstressed syllables and word endings. Thus, they may be slow acquiring morphological markers such as noun plurals, regular and irregular past-tense forms, comparatives and superlatives and others. However, morphological problems are often reflected in LD students' writing; reading comprehension may also be impacted.

Semantics

Current research suggests that students with LD have a generalized, underlying semantic deficit that results in two broad categories of problems: 1) word retrieval

problems and 2) difficulties with word meanings (Hallahan et al., 2005; Long, 2005). When students with LD experience word retrieval problems, they know the word they want to use; they just can't think of the word at the moment they need it. Research has suggested that LD students have word retrieval problems because they have difficulty accessing these words (Kail & Leonard, 1986; McGregor & Windsor, 1996).

Students with LD may learn words less completely than typically developing students because they have underdeveloped lexical systems. Manifestations of underdeveloped lexical systems include poor metalinguistic skills and impoverished vocabularies. Metalinguistic skills include the ability to think and talk about language; these skills cut across both spoken and written language.

Students with LD may have impoverished vocabularies due in part to difficulties with multiple word meanings (Kuder, 2003). For example, the word *rock* can mean three or four different things (stone, type of music, motion made with a baby). Students with LD often can only think of one definition for a word such as *rock*. Students with LD also have difficulty with recognizing and using words that are structurally related (e.g., synonyms and antonyms).

When asked to define common words, students with LD may take longer and make more errors than typically developing peers (Wiig & Semel, 1975). Nippold (1999) showed that LD students also experienced problems with defining abstract nouns such as *friendship* and *burden*. Vocabulary plays a very important role in reading, and having an impoverished vocabulary negatively impacts children's reading comprehension as well as their oral semantic skills (McGregor, 2004; Patterson & Pearson, 2004).

One vocabulary problem for students with LD is the comprehension and use of nonliteral or abstract meanings (Kuder, 2003; Nippold, 1998). Research had shown that these students have more difficulty explaining sentences composed of idioms or metaphors than do their typically developing peers. Students with LD often do not understand humor, and this can cause difficulties with both the classroom curriculum and with peers.

Pragmatics

Research has shown that, for the most part, students with LD may be less likely to find social acceptance with their peers due to poor pragmatic skills (Bender, 2004; Hallahan et al., 2005). Students with LD may have difficulty with topic management or staying on the topic that other students are discussing (Seidenberg, 2002). They may also have difficulty being sensitive to the needs of their conversational partners (Kuder, 2003).

One manifestation of this is difficulty with conversational repair. For example, a listener may be confused by what the LD student is saying. A typically developing student would be able to repair the breakdown or explain something in a different and clearer way. A student with LD might offer a confusing explanation and have difficulty reformulating his message. In a reversed situation, students with LD are less likely to ask for clarification if they do not understand what someone else is saying.

Students with LD are often viewed as rude and insensitive because they have a hard time adjusting their language to accommodate the status of their conversational partner. They lack the ability to understand what kind of language is appropriate in various situations in order to function adequately in those situations.

When students reach adolescence, difficulties with pragmatics skills can become a major problem. Adolescent conversations are fast paced, often removed from the here and now, and filled with innuendo, humor, and sarcasm. Adolescents greatly value perspective taking in conversations with peers, and students with LD frequently have difficulty taking the listener's perspective.

Table 6: Linguistic profiling for individuals with learning disability

Phonology	• Students with LD have difficulties in detecting and manipulating phonemes • They have problems in detecting rhyming words • Recognizing the same initial sound in words and isolating initial sounds is problematic in students with LD • They are unable to categorize onset and rimes • They have difficulty in isolating middle/ ending words • Blending sounds into words is also difficult for LD students • They have difficulty in segmenting or dividing sounds within words

Semantics	• Students with LD experience word retrieval problems • They may learn words less completely than typically developing students • They have underdeveloped lexical systems which leads to poor metalinguistic skills and impoverished vocabularies • They have difficulties with multiple word meanings • Students with LD may take longer and make more errors while defining common words • LD students also experience problems with defining abstract nouns • Reading comprehension and their oral semantic skills are also affected. • They have problems in comprehension and use of abstract meanings.

	• They have more difficulty explaining sentences composed of idioms or metaphors • Students with LD often do not understand humor
Syntax and Morphology	• Produce less syntactically complex sentences • They make more grammatical errors than typically developing peers • Comprehension of syntactically complex sentences is problematic • They have trouble understanding sentences that use negation, that use the passive voice and that use relative clauses. • They experience difficulty with parts of words that are hard to hear, such as unstressed syllables and word endings. • They may be slow acquiring morphological markers such as noun plurals, regular and irregular

	past-tense forms, comparatives and superlatives and others. • Morphological problems are often reflected in LD students' writing; reading comprehension may also be impacted
Pragmatics	• Students with LD may have difficulty with topic management • They may have difficulty being sensitive to the needs of their conversational partners • They have difficulty with conversational repair. • Less likely to ask for clarification • Lack the ability to understand the language appropriate to various situations

DISCUSSION

The aim of the present study was to profile the linguistic features of developmental disabilities such as autism, mental retardation, hearing impairment, specific language impairment and learning disability. Table 7 shows the linguistic profiling of these disorders.

There are lots of overlapping features among the developmental language disorders with respect to linguistic profiling as well. Each parameter seems to be affected however in varying degrees across the different disabilities. This aspect is elaborated upon in the following section.

Linguistic Parameters and Degrees of Deficiencies

In an individual with autism and learning disability there will be no impairment of phonology or phonological characteristics will be mildly impaired but in hearing impaired phonology will be severely affected. Mentally retarded individuals are slow in acquiring phonology whereas for individuals with specific language impairment phonological development varies with the type of SLI.

Mild impairment in semantic development is shown by individuals with hearing impairment whereas learning disability individuals show mild to moderate impairment. Autistic individuals show deviant development in the acquisition of semantics whereas the mentally retarded individual shows a moderate impairment. In SLI children semantic development varies with the types of SLI.

Syntax and morphology skills are moderately impaired in hearing impaired individuals whereas it is moderate to severely impaired in learning disabled individuals. In children with SLI, according to the type of disorder, acquisition of syntax and morphology will vary. In mentally retarded children the development of syntax and morphology is slow and in autistic it is delayed.

In individuals with autism and mental retardation, the pragmatic skills are severely impaired whereas in children with SLI and learning disability it is moderately impaired. Hearing impaired children are even reluctant to speak in a social situation.

As illustrated in table 7, it is observed that these disorders have certain similarities and a few dissimilarities within themselves. The features may vary according to the severity of the disorders. This profiling can be further used for differential diagnosis of these disorders and can also be used to identify the intervention strategies that are useful to these disorders.

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Table 7: Linguistic Profiling of the disorders

Parameters	Autism	Mental Retardation	Hearing Impaired	Specific Language Impairment	Learning Disability
Phonology	Mild or no impairment	Slow in acquiring	Severely impaired	*Mild impairment	Mild or no impairment
Semantics	Deviant development	Moderately impaired	Mild Impairment	*Severely impaired	Mild to moderate impairment
Syntax & Morphology	Delay in acquisition	Slow in development	Moderately Impaired	*Severely impaired	Moderate to severe impairment
Pragmatics	Severely impaired	Severely impaired	Reluctance to speak	*Moderately impaired	Moderately impaired

*Varies with type of SLI

Gernand & Moran (2007); Eric & Russel (2003); Michel & Robert (2000); Hegde & Maul (2006); Paul (2007).

Delay and Deviance

A long-standing differentiation in the literature on language impairments is the distinction between a language delay and a language deviance (Lee, 1966; Leonard, 1972). A language delay means that children could be delayed in the onset of their language system, which sometimes takes on the related meaning that they remain similar to younger children for a protracted period of time, and may or may not ever reach mastery levels. Such children are sometimes referred to as "late talkers", when the language delay is the only apparent developmental delay. The likelihood that they would "outgrow" such a delay, and when such a jump would be expected, remains a matter of ongoing investigation and some controversy in the literature (Thal & Katich, 1996).

A delay is an eventual, if deferred, arrival at a destination, not an absence of something or someone. Many early researchers and clinicians thought that a child who is slow to learn language will soon catch up with other children of comparable age. Therefore, the term language delay seemed to describe children who are "slow to talk". At their sluggish pace, slow talkers were expected to acquire atleast average language skills as they advanced through school (Hegde & Maul, 2006).

Although many children who exhibit mild and early language delay eventually acquire normal language skills, research has shown that some residual deficits may be evident in later childhood. Beitchman et al. (1996) found that children identified at age 5 as having low overall language skills continued to perform poorly on linguistic, cognitive, and academic measures when retested at the age of 12 years, 5 months. In a further study, Beitchman et al. (1996) found that children who had low overall language

skills at age 5 were more likely to develop behavioural difficulties, including aggressive and hyperactive symptoms by age 12 years, 5 months.

Rescorla (2002) examined 34 children described as "late talkers" as toddlers, comparing them at the age of 6-9 years to a matched group of 25 typically developing children. Although the late talkers performed in the average range on most language tasks by age 5, they had significantly lower scores through age 9 and were slightly less skilled in reading.

The research on residual deficits raises some important issues. First, an assessment of persistent language deficiencies in older children is difficult. Measures of vocabulary, language samples and standardized tests of morphologic and syntactic skills may grossly underestimate complex and abstract language skills that are necessary to perform well in high school and beyond. Therefore, it is likely that residual deficits in older children are greater than reported so far. Second, it is possible that more effective and intensive treatment than currently offered early in life will eliminate most if not all residual effects that seems to linger in some children. Third, children with severe language disorders who are also diagnosed to have complicating clinical conditions (e.g., developmental disability, neurological impairment) may continue to exhibit language deficiencies in spite of experiencing significant improvement with intensive and effective treatment. So, the assumption that language disorders will resolve themselves in such a brief duration as to cause no negative social and academic consequences for a child is untenable. Early intervention and parent training are essential in the case of all children with language disorders (Hegde & Maul, 2006).

Some experts in the past had wondered whether in acquiring language, some children follow a deviant pattern or follow the normal patterns but progress more slowly. Those who thought that language disorders are a result of some children following unusual or abnormal patterns were more likely to use the term language deviance. The term implies that a child with language difficulties is not just slow to acquire language, but exhibits a pattern of language not found in children who typically learn their language.

This is certainly true to some diagnostic categories. Children with autism, for example, may show patterns of language that are not found in other children, including those who are learning language normally or those who exhibit language disorders without any other complicating conditions. Nonetheless, the evidence is now overwhelming that many children who have language disorders follow the normal pattern of development, but the acquisition is slower and may plateau at a lower level than normal. Therefore, the term language deviance does not describe the language problems of most children with language disorders (Hegde & Maul, 2006).

Assessment and Profiling

Quantitative testing is generally standardized on a representative sample of normal speakers. This means that the scores assigned for particular areas of a test are calculated so that "average" or "acceptable" scores are directly relatable to what the standardized population would produce on average. Finally what a test gives is a score. This may be useful in an initial assessment to let us know whether a client does or does not fall broadly into a category of speech-language impaired, however it often cannot tell

us much more. This means that, scores often obscure which part of the client's phonology, or syntax etc. is actually impaired.

So, standardized quantitative tests are generally selective in the material that is investigated- leading to the lack of a comprehensive picture of the client's abilities; they rely too much on the recode of single responses to test requirements in an often very abnormal communicative situation; and by presenting the clinician with a numerical score they can only aid in basic questions of client classification, but not with more detailed diagnoses nor with the development of treatment plans (Ball, 1992).

The aim of a linguistic profile is to provide an assessment tool that avoids these drawbacks. An ideal profile should, therefore, be comprehensive rather than selective. It should be derived from natural speech, including spontaneous speech wherever possible, and should present as a result an overall picture of the client's performance, allowing a principled planning of intervention strategies. Profiles are not statements about the patient's ability. They are summaries of patient's performance, as reflected in his output in response to therapist's stimuli. In isolation a profile tells us little about how far patient is in control of a linguistic category, and gives us no direct information about his production or comprehension abilities (Crystal, 1992).

There are very few assessment tools that indicate severity of involvement of the linguistic parameters. However it becomes important to identify and include the severity level as far as possible. This would also facilitate accurate assessment and planning strategies for intervention. As the linguistic features overlaps between some of these disorders, linguistic parameters alone cannot be used for differential diagnosis of these disorders.

SUMMARY AND CONCLUSION

This review was focused on the linguistic parameters such as phonology, syntax, morphology, semantics and pragmatics in the developmental disorders like autism, mental retardation, hearing impaired, specific language disorder and learning disability. It is hoped that this review of linguistic profiling will serve as a reference for speech and hearing professionals, students and clinical linguists who are concerned with the assessment and intervention of individuals with developmental language disorders.

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