Semantic and Syntactic Deficits in Malayalam-Speaking Children with Learning Disability

Dr. Swapna Sebastian, Oviya M P, Ramanadham Thejesh, and Dr. Shyamala K.C.

The prevalence of speech–language delay among children has been reported to be about 2.3 to 19 percent (depending on the definition and the population studied) and about 2% to 8% attending paediatric outpatient department (1). Long term consequences of language impairment on school population have been studied by researchers. The language difficulties exhibited by most children with language impairment persist through out childhood and into early adolescence and these children with a history of preschool language impairments commonly have been reported to have academic difficulties (2–5).

Studies also show that children with dyslexia may present with relatively weak language skills compared with typically developing peers (6, 7).

Even though children with language-based learning disabilities compensate for their language deficits because they are very intelligent during early elementary school, as they progress into higher classes, the demand for language escalates and they suddenly seem frustrated, angry and anxious. The change in behaviour is attributed to "typical adolescent behaviour".

The present study aimed at comparing the different aspects of language among school going learning disabled children with that of normal peers.

Methodology

The study was planned with the following objective:

To compare the language skills of children with learning disability between the age group of 5-9 years with that of normal children.

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Procedure

The study was approved by the research ethics committee of the Institution and informed consent were taken from the parents of the children. In-order to achieve the above goals, study was conducted on 2 groups of subjects - experimental group (learning disabled) and control group.

The experimental group (learning disabled) consisted of 34 children between the age group of 5-9 years diagnosed as Learning disability by a multidisciplinary team consisting of a Neurologist, Speech Pathologist and Clinical Psychologist. The control group consisted of 34 normal children in the range of 5-9 years matched for sex and age.

The subjects selected were all Malayalam mother tongue speakers. (Malayalam is a Dravidian language spoken mainly in the state of Kerala in India). All the children who participated in the study were right-handed with normal hearing thresholds in both ears and were from middle and upper strata of the socio-economic ladder, from an Urban City.

Both the control and experimental groups were tested using Malayalam Language Test by Rukmini (8)

This test has two parts:

Part 1 Semantics & Part II Syntax

The semantics and syntax sections had 11 subsections each.

All the subsections of syntax checked for reception and expression whereas, for semantics, Semantic discrimination had items only for testing comprehension and lexical category had items only for testing expression. So, in effect Syntax had 11 subtests for both reception and expression and Semantics had 10 subtests for expression and reception. A description of the sub sections and the items under each are given below.

I. SEMANTICS - All the subsections checked for reception and expression except semantic discrimination and lexical category. The subtests are as follows.

1. Semantic discrimination - had items only for testing comprehension.

2. Naming

3. Lexical category - had items only for testing expression.

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4. Synonymy

5. Antonymy

6. Polar questions

7. Semantic anomaly

8. Paradigmatic relations

9. Syntagmatic relations

10. Semantic contiguity

11. Semantic similarity

Description of the test

1.   Semantic discrimination:

The two categories tested here were colors and body parts. For example, the child was shown a test plate with colors and was asked to point to the one named by the tester.

2.   Naming

This involved identifying the lexicon. In case of testing comprehension, the child was shown a test plate with different object pictures and was asked to point to the one named by the tester. In case of expression, he was required to name the item which was shown by the tester.

3.   Lexical category

A unit of vocabulary is generally referred to as a lexical item. Here the child was instructed to name as many items as possible from a given lexical category for example: animals within a specified time (one-minute)

4.   Synonymy

Lexical items, which have the same meaning, are synonyms and the relationship between them is one of synonymy. Here the child was given a pair of words and was instructed to indicate if they refer to the same thing or not like Door- window. The child was expected to respond with a yes or no answer accordingly.

For testing expression, the child was given a word say glass and was required to come out with another word which means the same. An acceptable response would be tumbler.

5.   Antonymy

A term used in semantics to refer to oppositeness of meaning. Here the child was provided with a pair of words and was asked to say if they are opposites or not. Example: Big-small. For expression the child was given a word and is asked to name e another one, which is an antonym.

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6. Polar Questions.

A term used for the system of positive and negative contrast found in a language. For testing comprehension, the child was given a question and was asked to give a yes or no response. Example: Is milk black in colour? When expression was being tested the child was given a pair of words and is asked to formulate a question using those. Example: Cow-milk and the response expected was does the Co w give milk?

7. Semantic Anomaly.

These are statements that contradict facts. In this case for testing comprehension, a statement was made, and the child was required to say if it is correct or wrong. Example Fire is cold. For testing expression, a wrong statement was mad e and the child was asked to correct it. Example: Apple is a vegetable. The expected response was Apple is a fruit.

8. Paradigmatic relations

It is a term in linguistics for the set of relationships a linguistic unit has with other units in specific context. Here the child was shown a test plate with pictures on it and was asked to point out 4 items that belong to the same category. Example: fruits, flowers etc. In the case of expression, the child was given two items and was asked to name another, which belongs to the same category.

9. Syntagmatic relations

The relationship between constituents (syntagms refers to the sequential characteristics of speech) in a construction are called syntagmatic relation. For testing comprehension, the child was given two pairs of words wherein one is right, and the other may be right or wrong, Example Night-Moon, Day-Sun. For expression the child was given one pair of words which is right and was given another word for which the child had to name a suitable syntagm. Example: Rabbit- Fast, Tortoise.

10. Semantic contiguity.

These are the relationship between noun and verb. Here the testing of comprehension was done by providing the child with a pair of words and asking him if they are semantically contiguous or not, that is whether there is any sort of relationship between the two. Example: Lamp-Candle. For expression, the child was given another word and was asked to name a semantically contiguous pair for it.

11. Semantic similarity

This expresses the inherent relationship between the items mentioned. Here for testing comprehension a pair of words was given to the child, and he was asked if the relationship

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was semantically acceptable or not. Example: Song-sing. For expression the child was required to come out with a semantically related pair for the stimulus provided.

II. SYNTAX- All the subsections of syntax checked for reception and expression. The subtests are as follows.

1. Moropho-phonemic-structures

2. Plurals

3. Tenses

4. Person Number and Gender (PNG) Markers

5. Case markers

6. Transitives, Intransitives, and Causatives

7. Sentence types

8. Conjunctions and Quantities

9. Comparatives

10. Conditional clauses

11. Participial constructions

Description of the Test

1.   Morphophonemic structures

These are special quasi-phonological units. In this case the child is provided with a pair of morphophonemes and was asked to choose the correct one among the two. For expression the child was shown a picture and was asked a question so as to elicit a suitable response.

2.   Plurals

Includes more than one. The testing was done using pictures, which had singulars and plurals of the same item.

3.   Tenses:

A category used in the grammatical description of verb referring primarily to the way the grammar marks the time at which the action denoted by the verb.

took place. Here both comprehension and expression were tested for all the 3 tenses viz., present, past and future using pictured test plates.

4.   Person Number and Gender (PNG)Markers:

Person: A category used in the grammatical description to indicate the nature of the participants in a situation. Usually, a three-way contrast is found. First person in which the

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speaker refers to himself, or to a group usual!) including himself, (e.g. I, We). Second person, in which the speaker typically refers to the person he is addressing (e.g. you) and third person, in which other people or things are referred to (e.g., she, it, they) The other two are self-explanatory. This was tested using picture plates which convey ideas like he is sleeping; the) are sleeping etc, for both Reception and Expression.

5.   Case Markers

A grammatical category used in the analysis of word classes to identify the syntactic relation between words in a sentence through such contrasts as nominative, accusative etc or a form taken by a noun, pronoun or adjective to show its relation to neighbouring words. Both reception and expression were tested using test plates. Examples are mother is taking water from the bucket, he is writing with a pen.

6.   Transitive, Intransitives and Causative

A category used in the grammar analysis of clause/sentence construction with particular reference to the verb relationship to dependent elements or structure. Transitive refers to a verb, which can take a direct object. (Example: he wants a ball). Causative is a grammatical category used to refer to the causal relationship between alternative versions of a sentence. Here too the testing was done using picture cards. Some of the samples are: Mother is sleeping; Mother is making the child sleep.

7.   Sentence Types.

Refer to different sentence types as simple, declarative, interrogative etc. this case comprehension was tested using sentences belonging to these different categories and the children were instructed to respond by pointing out the appropriate picture. Example: There are flowers in the pond. For expression the children were asked to com e out with sentences in different forms, according to picture as requested by the tester.

8.   Conjunctions and Quantities

These are terms used to connect both the meaning and the construction of sentence elements. Here picture plates were incorporated for testing both comprehension and Expression. Example: There is a book and a pen on the table

9.   Comparatives

A term used to characterize a major branch of linguistics in which the primary concern is to make statements comparing the characteristics of two different lexical items, which are semantically related. While testing comprehension the tester asked the child to show him an item in comparison to the stimulus item. Example: The tester pointed to the picture of a house

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and said " Sho w me the house that is bigger than this." Expression was also tested in a similar manner.

10.   Conditional Clauses

A term used in grammatical description to refer to clauses whose semantic role is the expression of hypothesis or conditions. (Example: if. unless) Here for testing the Receptive skills, the child was shown a picture card with several pictures (Example: animals) and was told to respond in a particular manner if the stimuli choices have a particular stimulus. Example: Clap your hands if there is an elephant's picture. For testing expression, he was asked questions which require answers employing the conditional clauses. Example: When n do you drink water' An expected response was when 1 am thirsty.

11.   Participial Constructions

A traditional grammatical term used to refer to a word derived from a verb and used as an adjective as in "a laughing face". Testing was done using test plates and some of the examples of stimuli used were: He is eating while reading He fell down while playing.

Scoring

The responses were recorded as correct, incorrect or No response.

Scoring was done in the following manner for all, except lexical category, paradigmatic relations, plurals, and tenses.

Correct Response-1

Partially correct response- 1/2

Incorrect response or no response 0

For lexical category the scoring was done as follows

Naming of a single item 0

Naming of 2 or 3 items 1/2

Naming of 4 or more items 1

For paradigmatic relations-comprehension the scoring was as follows:

No response or identification of 1 item -- 0

Identification of 2 or 3 items -- 1/2

Identification of 4 items -- 1

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For plural and tenses each item had two sub items and each sub item was provided with a score of 1/2

Statistical Analysis

Using the SPSS software, one way ANOVA was done to analyse the significance of difference between the control and the experimental groups.

Results and Discussion

The present study examined the language skills of children with learning disability and normal controls between the age group of 5-9 years. One way ANOVA revealed that there was a significant difference between children with learning disability and the normal controls in both syntax and semantics. [semantic reception (F=141.70:P<0.0000), semantic expression (F=165.2 P<0.000), syntax reception (F=122.432: p<0.000) and syntax expression (F=89.312)]

Semantic Reception of MLT

Group	Mean	Std Deviation	N
LD	41.21	4.04	34
Normal	50.33	3.24	34

Semantic Expression of MLT

Group	Mean	Std Deviation	N
LD	24.06	3.70	34
Normal	43.15	4.65	34

Syntax Reception

Group	Mean	Std Deviation	N
LD	37.62	5.86	34
Normal	51.91	2.26	34

Syntax Expression

Group	Mean	Std Deviation	N
LD	23.74	7.06	34
Normal	44.55	7.31	34

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Syntax Reception				
Sub	LD	Normal	F	Significance
SYR1	2.32	3.36	46.654	0.000
SYR2	2.79	4.82	63.816	0.000
SYR3	2.74	4.52	30.246	0.000
SYR4	2.76	4.55	38.410	0.000
SYR5	2.91	5.00	84.385	0.000
SYR6	3.53	4 .73	51.238	0.000
SYR7	3.65	4.97	57.156	0.000
SYR8	4.32	4.97	97.887	0.000
SYR9	4.09	5.00	102.445	0.000
SYR10	5.00	5.00	270.077	0.000
SYR11	3.50	5.00	168.764	0.000
Total syntax reception	37.62	51.91	122.432	0.000

Syntax Expression				
Sub	LD	Normal	F	Significance
SYE1	2.82	4.79	52.296	0.000
SYE2	3.12	4.79	63.185	0.000
SYE3	1.71	4.06	62.696	0.000
SYE4	1.88	4.79	134.858	0.000
SYE5	2.5	4.79	113.71	0.000
SYE6	2.18	3.79	37.639	0.000
SYE7	2.06	2.91	29.147	0.000
SYE8	1.62	2.94	38.076	0.000
SYE9	2.32	3.27	35.121	0.000
SYE10	2.56	4.S2	93.445	0.000

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SYE11	0.97	3.6	3.905	0.003
Total syntax Expression	23.74	44.55	89.312	0.000

Semantic Reception				
Sub	LD	Normal	F	Significance
SMR1	912	9.85	147.8I	0.000
SMR2	4.91	5.00	652.77	0.000
SMR3	3.09	3.82	46.98	0.000
SMR4	0.74	3.18	42.449	0.000
SMR5	4.38	4.91	83.433	0.000
SMR6	3.38	4.79	42.39	0.000
SMR7	3.94	4.82	55.51	0.000
SMR8	4.47	4.85	75.86	0.000
SMR9	3.47	4.21	62.98	0.000
SMR10	3.71	4.91	64.56	0.000
Total Semantic reception	41.21	50.33	141.70	0.000

Semantic Expression				
Sub	LD	Normal	F	Significance
SME1	4.85	5.00	965.08	0.000
SME2	4.71	4.94	127.52	0.000
SME3	0.94	3.48	42.46	0.000
SME4	0.47	3.36	34.92	0.000
SME5	0.00	2.58	20.77	0.000
SME6	0.85	4.82	153.79	0.000

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SME7	3.76	4.85	106.96	0.000
SME8	3.88	4.91	117.623	0.000
SME9	2.29	4.30	61.327	0.000
SME10	2.29	4.91	86.821	0.000
Total Semantic Expression	24.06	43.15	165.2	0.000

Discussion

The learning-disabled children performed significantly poorer than their controls on all the language tasks measured using Malayalam Language Test.

Semantics

The children with learning disability obtained poorer scores than their normally achieving peers on the measures of semantic reception (41.21 as compared to 50.33) and semantic expression (24.06 as compared to 43.15). The subsections of semantic discrimination, naming and lexical category were relatively easier for the children and had performed better compared to the other subsections.

Syntax

The children with academic learning disability obtained poorer scores than their normally achieving peers on the measures of syntax reception (37.62 as compared to 51.91) and syntax expression (23.74 as compared to 44.55). In the syntax section, the subsections of comparatives and conditional clauses were found to be relatively easier.

The semantic and syntactic comprehension ability was found to be better than the expression ability in both the learning-disabled children and the normally achieving children.

In general, the results obtained on the Malayalam language test indicate that there is a considerable difference in the development of both semantics and syntax in the learning-disabled children compared to the normally achieving children. This finding is in agreement with studies in other languages which showed that children with dyslexia perform more poorly than the normally achieving children on the tasks of semantics and syntax. (9,10)

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Analysis of the case history of these children revealed that ten children with learning disability (29.4%) had a history of delayed speech and language whereas only one child in the control group (2.9%) had a history of delayed speech and language milestones. This again showed an association between deficits in language and learning disability at school age.

Poor academic achievement in children with normal nonverbal intelligence could be pointing towards deficits in different aspects of language. Follow up studies by Rutter, Mawhood, and Howlin on children initially diagnosed as having developmental language disorder showed that language difficulties were still evident in adulthood (2). When the demands on language increases, these children fail in their academic skills.

Summary and Conclusions

The study tried to compare the different aspects of semantics and syntax in learning disabled children with their normal peers. The results revealed that even though the learning-disabled children had adequate language to manage their daily living activities, they were inferior to their normal peers in finer aspects as revealed in the testing using Malayalam Language Test. The clinical implications of the study are that Children with preschool language impairments should be followed carefully into elementary school as they are at risk for learning disability. The study also implies that there is a critical need for professional support to learning disabled children across the life span even during their adolescent ages.

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