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Semantic Intentions and Relations in Children with Intellectual Disability (ID) in the Mental Age Range of 4 to 7 Years

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Abstract
Children with intellectual disability show a wide range of speech and language problems. The research on language acquisition in India has been carried out mostly through dissertations (Karanth, 1993). Krupa, (2008) showed that cognitive development influences language development to a greater extent. However, cognitive development and language development do not have linear relationship. The present paper study attempts to modify the method of analyzing semantic data, by incorporating the frequency rather than the presence of the use of each semantic element in the spontaneous language samples of ID children with mental age of 4 to 7 years and 4 to 7 year old normal children. Comparison between the two groups would give us valuable information to develop better methods of assessment as well as intervention. Hence this study in general goes a step further in measuring the frequency of responses of semantic intentions and semantic relations of similar population between the ages of 4-7 years. The present study could not include video recording for data collection. Future study will need to include video recording in individual and group settings to elicit wider semantic data.
Key words: Intellectual Disability, Semantic Intentions, Semantic Relations

1. Introduction

Children with intellectual disability show a wide range of speech and language problems. They frequently show delays in language development, as language and cognitive development are closely linked. Subbarao (1995) has noted that predicting language performance in general based on mental age alone would complicate the picture as the differences are not uniform in the way in which ID children lagged behind matched normal subjects. The study noted that ID subjects produced very few spontaneous utterances showed difficulty in accessing and recalling information and availability of stored information.(Kiernan;1970). The general area of language functioning noted to be most difficult for the ID subjects was syntax. Phonological and syntactic aspects showed a varied performance. The author stresses the importance of considering detailed examination of further subjects before generalising the issues. Comparable performance was seen with respect to meaning intentions and relations. The findings appear to be generally consistent across many different subgroups of ID children. Children with Down syndrome have more difficulty with expressive language than receptive language. Miller (1988) found that more than 75 percent of his subjects' demonstrated deficits in language production when compared to language comprehension and cognitive skills, and that the expressive language difficulties increase over time (Miller, 1988, 1992).

In light of the brief discussion of findings of syntax and semantic studies in subjects with ID, it can be noted that semantic intentions and relations are studied relatively less. Similar picture can be attributed to Indian context also. In one notable study Subbarao (1995) analysed spontaneous language samples of 60 subjects with mental retardation (30 subjects of 4-5 years mental age and 30 subjects of 5-6 years mental age) at phonetic, syntactic and semantic levels. Semantic intentions at word level expressions and semantic relations at phrase level expressions were analysed. It was noted that the semantic intentions present in all (MR) subjects were intentions of existence, possession, location, action, object and agent in their samples. Negation, non-existence, notice, question and attribution are found in 60% or more subjects. Both subgroups present no evidence of usage of recurrence and cessation. In terms of semantic relations, subjects showed 80% or more responses, to expression of existence, agent + action, possessor + possession, action + object types. Expression of non-existence, entity + location, attribute + entity, were used by lesser number of subjects. Recurrence and action + location were least used. Recurrence was not used by both groups. The author has emphasized that studies of semantic intentions and relations should be further conducted by finding the frequency of these aspects in the speaker's language samples. Therefore this study goes a step further by quantifying the responses or finding the frequency of responses in the semantic aspect of intentions and relations.

Need for the study:

Large scale data in any one language for different age ranges is not available. Hence it is difficult to visualise and describe language acquisition in any Indian language. It is essential that systematic, observational

and experimental study of language acquisition in children in different languages needs to be conducted in India, both for developing assessments and intervention programmes. (Hegde, 1990). Few attempts at creating language tests are present, but they are not yet commercially available for routine use (RRTC & AYJNIHH language test; Linguistic Profile Test (LPT) Karanth, 1985; Test of Acquisition of Syntax in Kannada (TASK) Vijayalaxmi, 1981). Obtaining broad based, naturalistic samples and descriptive language analyses in Indian contexts has been tried previously in a few studies. As mentioned previously Subbarao (1995) found a comparable performance in semantic aspects between the 4 to 6 year old normal children with mental age (MA) 4 to 6 year old children with mental retardation. In the methodology, the presence or absence of the semantic aspects was noted. The present study attempts to modify the method of analysing semantic data, by incorporating the frequency of the use of each semantic element in the spontaneous language samples of 4 to 7 year normal children and children with ID in the mental ages of 4 to 7 years. It helps in analyzing the data of semantic aspects (intentions and relations) in children with intellectual deficits as compared to typically developing children of similar mental age range. It would also give us the overall comparison between the two groups being tested and would finally give us valuable information to develop better methods and assessment procedures as well as intervention programmes for the population of mentally challenged children.

1.1 Aims of the study:

The present study aims to obtain extensive language data in Kannada speaking children with intellectual deficit with the objectives of:

1. Analysing their data at semantic intention level as compared to mental age (MA) matched normal subjects
2. Analysing their data at semantic relation level as compared to mental age (MA) matched normal subjects
3. Comparing their overall performance with the mental age matched normal subjects across the two levels of semantic performance.

1.1.1 Methodology:

Subjects:-

Subjects included 10 children with intellectual disability and 5 typically developing children.

1. Typically developing subjects:

Establishing profiles of typically developing children was found necessary because of the need for comparison with mentally retarded population.

- All 5 children in the age range of 4-7 years were selected.
- All 5 were attending a Kannada medium school.
- They had no associated handicaps or illnesses and had Kannada as their major language.

2. Subjects with Intellectual Deficit:

10 intellectually disabled children were selected as subjects for data collection based on the following criteria

- Their mental Ages (MA) ranged from 4 years to 7 years on an assessment done by certified psychologist.
- The chronological age (CA) range was 8 years minimum to 12 years maximum. There were 5 male and 5 female subjects
- All children had no additional physical and sensory handicaps
- All were attending speech language therapy for at least 2 years at a speech and hearing clinic and special education centre.
- All the children used Kannada language as their major communication medium.
- This CA range was selected because children with mild and moderate mental retardation would fall within the 4-7 years MA range

Semantic aspects used for analysis:

The study envisaged obtaining an audio taped conversational sample with normally speaking and the MA matched children with intellectual deficit and subjecting the language data to semantic analysis. Responses of word level were analysed as semantic intentions. A list of semantic intentions was selected from a discussion by Coupe, Barton and Walker (1988) and also a description by Carrow-Woolfolk and Lynch (1982). Phrase level utterances were analysed as semantic relations. A list of 10 semantic relations were selected from a

description by Carrow-Woolfolk and Lynch (1982) which is based on many works by Brown (1973), Bloom (1970), Schlesinger (1971), Miller (1978) and others.

1.1.2 Data collection and analysis:

As the purpose of data collection was to obtain 5-7 minute conversational sample of each subject, only one child was present at a time with the tester. Initial two minutes comprised of spontaneous speech elicitation or free conversation. The final 4-5 minutes were utilized for obtaining elicited responses for prompted play situations utilizing toys (bus, jeep, auto rickshaw) and pictures (classroom, hospital). Topics not related to immediate surroundings, like daily routines, family members, favourite food etc. were discussed. As far as possible, spontaneous conversation was encouraged. Only with reluctant children, guiding questions were used. All the subjects were interacted with using the same stimulus material. The entire session was audio tape recorded by using Sony digital voice recorder. The recording environment was a quiet corner room in the school building. Additional notes regarding the recording situations and activities were taken. The method of transcription closely followed the guidelines of LARSP procedure and from study done by Subbarao (1995). Each of the utterance of the Tester (T) and Pupil/subject (P) were transcribed verbatim, within few hours of recording on the same day. The transcribed data was checked twice by the investigator for accuracy, when in doubt another qualified speech-language pathologist checked the transcription. The sample thus obtained was subjected to analysis of frequency of responses of semantic intentions and semantic relations.

Semantic intentions:

Meaning intentions in one word responses were analysed. The intentions selected were 13 ranging from nomination to attribution.

As noted earlier the intentions were selected from discussions by Coupe, Barton and Walker (1988) and Carrow- Woolfolk and Lynch (1982). A brief description of each intention are given below

Existence: Children expressed the presence of an object by naming in response to question stimuli
Non-existence: expressing that an object or a person is not present, when queried.
Recurrence: Child requests reappearance of an object.
Negation: Child negates the statement of others.
Location: indication of place of action or object, in response to a stimulus.
Notice: Child indicates the sudden appearance of an object, by naming or commenting.
Cessation: child indicates stoppage of an activity
Possession: Child indicates the relationship between an object or a person with the action
Or another object
Question: Child enquires some information from others or wants clarification of an issue.
Action: Child informs about the action in a context.
Attribution: Child indicates some characteristic of an object, person or action. .
Object: Here in an action, the affected or the object is named.
Agent: Here the person/object doing the action is named.

Semantic relations:

This scan included 10 types of semantic relations expressing verbal representations of what the child perceived and related to (Schlesinger, 1971, Brown, 1973; Carrow-Woolfolk and Lynch, 1982). Here the two word constructions of the subject in the transcription were looked into, taking the context into consideration, to decide on the frequency of responses of the relations. The semantic relations taken are given below:

Existence (nomination + x):
Recurrence (more + x):
Non-existence (no more + x):
Agent + Action:
Action + object:
Agent + object:
Action + Locative:
Entity + Locative:
Possessor + Possession:
Attribute + Entity:

Initially, the data on 4 to 7 year normal children was analysed and frequency of responses of each of the structure listed was marked. Similar procedure was followed for data collection with the intellectually disabled population. For both the groups, the number of persons responding/showing the frequency of response of a structure was counted and was treated as a raw score. This was used to broadly compare the groups normal and 4-7 years mental aged (ID) children.

1.1.3 Results

Semantic Intentions

Normal Subjects:

Table-1 shows the frequency of presence of semantic intentions. As can be observed, the most frequent intention is existence (29.62%) followed by location (22%), object(14.81%), agent(12.96%) and action(11.11%). Other intentions such as negation, question, attribution and others were not observed in the sample. The mean number of existence and location is the most predominant.

(ID) subjects

Table 1 indicates presence of frequency of semantic intentions in ID subjects. Here existence (50.52%) is the most dominant intention followed by action and location which are above 10%. In general, subjects with ID demonstrate a wider usage of intentions.

Table 1.Semantic intentions- frequency of use in normal and ID children

	NORMAL			INTELLECTUALLY DISABLED(ID)		
SEMANTIC INTENTIONS	TOTAL (n=5)	MEAN	PERCENTAGE	TOTAL (n=10)	MEAN	PERCENTAGE
EXISTENCE	16	3.2	29.62%	96	9.6	50.52%
LOCATION	12	2.4	22.22%	21	2.1	11.05%
OBJECT	8	1.6	14.81%	11	1.1	5.78%
AGENT	7	1.16	12.96%	9	0.9	4.73%
ACTION	6	1.2	11.11%	30	3	15.78%
NEGATION,	5	1	9.2%	5	0.5	2.63%
NON-EXISTENCE	-	-	0%	1	0.1	0.5%
QUESTION	-	-	0%	8	0.8	4.21%
ATTRIBUTION	-	-	0%	6	0.6	3.15%
RECURRENCE	-	-	0%	-	-	0%
NOTICE	-	-	0%	-	-	0%
POSSESSION	-	-	0%	-	-	0%
CESSATION	-	-	0%	3	0.3	1.57%

Comparison of normal and ID subjects

Table 1 shows that performance of the two groups is quite varied. Subjects with (ID) showed a significant higher mean of 9.6% compared to 3.2% as the mean showed by normal groups. The subjects with (ID) had presence of wider set of intentions than normal subjects. A total number of six intentions were observed in normal children and comparatively nine intentions are present in (ID) subjects. Except for the intention of ‘existence’, the other intentions are varied between the two groups. ID subjects showed a higher frequency of use of several intentions. The ‘existence’ mean frequencies were observed to be significantly different (at 0.01 level) between the groups as shown in table 2.

Table 2 Subjects performance on the semantic intention of existence

S. N	Semantic intention	Subjects	Mean	Standard deviation	t-value	Significance (0.01 level)
1	Existence	Normal	3.2	1.32	2.109	Significant
		intellectually disabled	9.6	6.24		

Semantic Relations

Normal Subjects:

Table 3 indicates presence of frequency of semantic intentions. Agent + action are the most frequent (45.45%) two-word utterance observed in normal subjects. Action+ object, action + location are the next two in priority for normal subjects. Other semantic intentions are less frequent or absent

(ID)Subjects:

As observed in semantic intentions a wide variety of two –word semantic relations are observed in this group. Agent + action (45.45%) and action + object (36.36%) are the most frequently seen structures as shown in table 3.

TABLE-3: SEMANTIC RELATIONS IN NORMAL AND ID SUBJECTS

	NORMAL			INTELLECTUALLY DISABLED		
SEMANTIC RELATIONS	TOTAL (N=5)	MEAN	PERCENTAGE	TOTAL (N=10)	MEAN	PERCENTAGE
AGENT+ACTION	11	2.2	45.83%	30	3.0	45.45%
ACTION+OBJECT	5	1	20.83%	24	2.4	36.36%
ACTION+LOCATIVE	5	1	20.83%	5	0.5	7.57%
EXISTENCE(nomination+x)	2	0.4	8.33%	5	0.5	7.57%
AGENT+OBJECT	1	0.2	4.16%	1	0.1	0%
ENTITY+LOCATIVE	-	-	0%	1	0.1	1.51%
ATTRIBUTE+ENTITY +x)	-	-	0%	-	-	7.57%
RECURRENCE(more+x)	-	-	0%	-	-	0%
NON-EXISTENCE(no more +x)	-	-	0%	-	-	0%
POSSESSOR+POSSESSION	-	-	0%			0%
AGENT+LOCATIVE	-	-	0%			1.51%

Comparison of normal and (ID) subjects:

As observed in semantic intentions, 4-7 year old (ID) subjects showed similar performance with normal children in their frequency of use but higher level of performance was observed across two relations (agent + action, action + object). Hence statistically, significant difference was seen between the two groups as shown in table 4.

Table 4: subjects' performance on semantic relations of action + object and agent + action

S. N	Semantic relation	Subjects	Mean	Standard deviation	t-value	Significance (0.01 level)
1	Agent + action	Normal	2.2	0.74	2.166	Significant
		intellectually disabled	3	2.72		
2	Action + object	Normal	1	1.095	1.367	Significant
		intellectually disabled	2.4	1.854		

Table 4 shows the results of the study that was undertaken comparing semantic relations between normal and intellectually disabled children. The mean and standard deviation of the semantic relations of both normal and intellectually disabled children were compared. A statistical t-test was done between means of the two semantic relations of both groups. This comparison clearly indicates significant differences between the normal and intellectually disabled group of each semantic relation at 0.01 levels which is clearly significant in both semantic relations.

1.1.4 Discussion

Vaidyanathan (1989) while studying language acquisition within a pragmatic framework noted that interrogatives serve multiple communicative functions like request, identification, verbalization, labelling, description, testing knowledge, etc. These observations are supported by Uma (1993), who evaluated language behaviour of normal children and hearing impaired children. The detailed information obtained in the study done by Subba rao (1995) agrees with these observations. In the present study 4-7 years old typically developing children displayed a variety of semantic aspects. This data formed the background to compare the intellectually disabled subjects with mental ages of 4-7 years. While evaluating the normal subject's performance on quantitative measures, they responded with more than one sentence for one stimulus. In general less than two words were observed per utterance. These values would be more appropriate for use in individual evaluations.

1.1.5 Conclusion

The decreased presence of recurrence and cessation at word level does not reflect the nature of sampling the language data in the present study, in which children mainly responded rather than initiate communication. This could also reflect cultural values of our society, where questioning elders and telling them to do something (like stopping an activity) are not encouraged. This study in general goes a step further in measuring the frequency of responses of semantic intentions and semantic relations of similar population between the ages of 4-7 years. It helps in analyzing the data of semantic aspects (intentions and relations) in children with intellectual deficits as compared to typically developing children of similar mental age range. It would also give us the overall comparison between the two groups being tested and would finally give us valuable information to develop better methods and assessment procedures as well as intervention programmes for the population of intellectually disabled children.

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