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KPVT-A Screening picture Vocabulary Test In Kannada

N. Sreedevi
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The importance of measurement of vacabulary development of children is well known in the diagnosis and treatment of child language disorders. In the present study an attempt was made to design a screening picture vocabulary test in Kannada for children in the age range of 3 to 6 years. Norms were established on 120 Kannada medium school children of Mysore-city. All the children had kannada as their native language. This is a screening test and it gives a quick and easy measure of whether a child is deficient in language acquistition. The test is based on the vocabulary lists constructed by the Karnataka State Directorate of Education, Research, Training and Text books.

Children's knowledge of words has long served as an index of their language maturity . Human beings communicate in a variety of ways but mainly verbal communication has always remained in the foreground. For a present day child, in and out of school, the world is often a world of words. What a person speaks, hears, reads, writes and often what he visualizes and observes-the whole sensorium of man is expressed in words. Meaningful vocabulary building is concept building. Therefore information on the size of a child's vocabulary has been of interest to both speech language pathologists and educators in the area of language development and hence its measure is crucial in language assessment.

In order to evaluate the language development and status, we need to obtain a sample of an individuals speech that will lend itself to rather comprehensive analysis. Some of the useful measures of verbal output reported in the literature are mean length of response (Nice, 1925), mean of 5 longest responses(Davis, 1937), Number of one word responses (Davis, 1937, and Templin, 1957), mean morphological units (Brown, 1973) etc.

Standardized semantic formulation tools are few in number limited in age range and Limited in semantic concepts tapped.

Some of the existing vocabulary tests are:

1. Full range picture vocabulary tests - Amons and Amons (1948) 2 years to adult.
2. Peabody picture vocabulary test (PPVT) - Dunn (1965) 2 to 18 years.
3. Assessment of childrens language comprehension - Foster et.al. 1972.
4. Test of auditory comprehension of language - Carrow Woolfolk (1973) - 3 to 6.11 years.
5. Test of language development scale-New Comer and Hamill (1911) 4 years to 8.11 years etc.

There are very few standardized tools available to measure semantic formulation in Indian children. Therefore the present study attempts to design a screening test based on the vocabulary development of children in the age range of 3-6 years in Kannada language. Such a screening test

would help in a quick evaluation of the vocabulary development of young children in order ot identify delays if any. This aids us in the evaluation of language disordered children and in their therapy planning.

METHODOLOGY:

The present study is based on a vocabulary survey carried out by the Karnataka State Directorate of Education, Research, Training and Text books.

The study was conducted in the following steps :-

1. Construction of the test.
2. Establishment of norms
3. Statistical analysis of the normative data.

Construction of the test: Words selected from the above mentioned vocabulary list had a frequency of occurrance of 40-60% in the respective age group considered for the study. The words were selected in such a way in that there were discriminative, picturable and unambigious. 30 words were selected as target words and three distractors were also selected for each of the target words.

The test material consisted of 30 picture plates with each plate containing 4 black and white drawings and individual test record to tecord the scores of the subjects.

For establishment of norms the test was administered to 120 Kannada speaking children studying in a Kannada medium school of Mysore city. The 3 age groups considered were 3 to 4, 4 to 5 and 5 to 6 years. 40 children were tested in each age group. Subjects were those

- whose mother tongue was Kannada.
- who resided in a Kannada speaking environment
- who did not show any sensory or physical deformities.

Procedure: The test administration was individualized and was conducted in an environment with less distraction. Each child was shown the 30 picture plates in order and was asked to point to the target picture on each plate.

Scoring: Each correct item was given a score of 1. So the maximum possible score of a subject would be 30. The results obtained thus were compiled and analysed to develop norms in the form of 'percentile rank table'. Administration of the test takes around 15 minutes.

RESULTS AND DISCUSSION:

The 30 target items obtained scores in a hiararchy in all the 3 groups. It was observed that total number of correct responses increased as a function of age.

Using the percentile of ranks' method the scores of all the 3 groups were converted into percentile ranks. The percentile ranks are given in Tables, 1, *2,* and 3 for the 3 age groups respectively.

Table-1: Percentile ranks for 3 to 4 years group.

cores	Percentile ranks
24	98.75
23	93.75
22	78.75
21	62.50
20	43.75
19	22.50
18	11.25
17	5.00
16	1.25

By refering to the percentile rank table of the respective age group, the total raw score obtained is coverted into a percentile equivalent. this value indicates whether the child's vocabulary is appropriate for his chronological age or not.

Table-2: Percentile ranks for 4 to 5 years group.

cores	Percentilc ranks
28	98.75
27	90.00
26	77.50
25	63.75
24	45.00
23	31.25
22	17.50
21	5.00
20	1.25

Table-3: Percentile ranks for 5 to 6 years group.

Scores	Percentile ranks
30	95.00
29	83.75
28	65.00
27	38.75
26	20.00
25	10.00
24	2.50

A percentile rank of 50 and above is considered as normal.

It is hoped that this test would help in screening the vocabulary age of the language disordered children brought to the speech and hearing clinics.

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Analysis and Synthesis of Speech of Hearing Impaired

Sheela K.
II M.Sc

"One of the most recognized but probably least understood concomitants of deafness is a deficit of oral communication skills". (Metz etal., 1982). "Deafness is a fearsome problem largely because of the barrier to communication which it creates. The obvious effect of this barrier is to prevent the deaf from understanding what others say, but it may also impede them from speaking intelligibly. The magnitude of their problem is illustrated by recent studies suggesting that of prelingually deaf children, hearing losses of 90 dB or more, about 75% have speech classified as "barely intelligible" or "worse". (Conrad, 1979).

"Speech training must be efficient in order to get intelligible speech. An efficient speech training program requires that there are methods to estimate the impact of these errors on the intelligibility". (Oster, 1985).

The low speech achievement of the hearing impaired has led to several investigations in the past to correlate speech intelligibility with several receptive and productive variables of speech.

Speech intelligibility is correlated with segmental and supra-segmental errors on the production side. And there is much documentation of the kinds of errors seen in the speech of the hearing impaired.

Some attempts have been made to study the direct effect of segmental and suprasegmental error corrections on deaf speech using modern computer processing techniques. (Land, 1975; Osberger & Levitt, 1979; Maassen & Povel, 1984 a, b, 1985; Oster, 1985). The advantage of such techniques is that it is possible to determine the causal relationship between the error type and intelligibility without the presence of any other confounding variables. Also, results of such studies will help in determining the error types and the kinds of errors that should be considered first when planning a training program for the improvement of speech in the hearing impaired child.

No such studies have been reported on India population and that too in Kannada speaking deaf speakers. Hence, the present investigation was undertaken in order to study the effect of some suprasegmental error corrections on the intelligibility of speech of the hearing impaired.

For congenitally deaf children in the age range of 8-10 years were selected from the therapy clinic of All India Institute of Speech and Hearing, for the study. All these children had severe to profound sensorineural hearing loss. They had no additional handicap other than that directly related to the hearing impairment. All could read simple bisyllabic words in Kannada.

Eight simple bisyllabic Kannada words with VCV combination were selected from the test developed by Babu, Rathna and Bettegeri (1972). The speech samples of all the four children were recorded as they read the words. Recordings were also obtained

of a matched group (for age and sex) of four normal hearing children reading the same set of words.

I Stage: The samples were then analyzed using a PC-XT.

The following six parameters were obtained

1. Vowel duration (both initial and final);
2. Duration of pauses, if any;
3. Total duration of the words;
4. Average fo;
5. Formant frequencies (F1, F2, F_3)
6. Bandwidths (B1, B_2, B_3)

The obtained data was subjected to statistical analysis, in order to determine the mean, standard deviation and significance of differences.

The following conclusions were drawn:

1. On the average, the hearing impaired group had significantly longer durations for vowels than that of normal hearing group.

2. Normal hearing children did not show any intersyllabic pauses (intraword) whereas 3 out of 4 children in the hearing impaired group inserted intersyllabic pauses atleast once.

3. The total durations of the words uttered by the hearing impaired children were significantly longer than that of the normal hearing group.

4. On the Whole, higher average Fo than that of the normal hearing group was exhibited by the hearing impaired children.

5. The hearing impaired children had higher first formant (Fl) and second formant (F2) and lower third Formant (F3) values when compared to that of normal hearing group.

6. The hearing impaired children had smaller values of band-widths when compared to their normal counterparts; which was not significant statistically.

In all the instances, the hearing impaired children exhibited greater variability than normal children.

II Stage: Some aspects of the suprasegmental errors in the digitized data of hearing impaired children's speech were modified in the next stage. Three measures were considered.

Those were:

(1) Correction of pause, if any,
(2) Correction of vowel duration
(3) Correction of average Fo

All the measures were corrected, either in isolation or in combination. Thus altogether, seven types of corrections were performed.

Correction of pauses, vowel duration, average Fo, pauses and vowel duration, vowel duration & Fo, pause & Fo and pause and vowel duration.

Whenever the Fo values were edited, the data was synthesized using cascading synthesizing program.

III Stage: The unaltered Utterances and the corrected utterances (total 256 utterances) were mixed together and randomized. These 256 words were recorded into six audio cassettes. Five judges (2 speech and hearing professionals, 2 speech and hearing students and one listener who had not been exposed to deaf speech much before) were given those cassettes for word identification task and intelligibility rating.

The number of words identified correctly were converted into percent scores using a formula,

$$\frac{\text{No. of words identified correctly}}{\text{Total No. of words present}} \times 100$$

in the world identification task. Separate scores were found out under each category. The judges had to rate the intelligibility on a five point interval scale, ranging from '0'

(unintelligible) to '4' (highly intelligible).

The judges had to judge the speech samples provided to them under two conditions. They had to listen to the words and write down whatever they heard and rate the intelligibility (open set of responses. In the second step, they were informed regarding the words used in the study. After this again they had to repeat the 1st step (closed set of responses.

The Pearson's correlation method was applied to find out the interjudge reliability. It showed good correlation between the judges. The intrajudge correlation was high too.

The results showed that the correction of vowel duration had a significant positive effect on intelligibility, while all the other types of corrections had detrimental effects on intelligibility. This was reflected in both the kinds of response criterion.

The correction of vowel duration showed 3% imporvement (approximately) in open set of responses and 9.5% imporvement in closed set of responses.

The overall correct identification for original utterances renged from 3.4% to 15.3% (with a mean of 8.5%) and 27.1% to 49.1% (with a mean score of 40.3% for open and closed set of responses respectively.

The results were also analysed to find out which of the 8 words has been identified correctly most of the time. The word /u:ta/ topped the list in both the conditions followed by /a:ne/, /ondu/, /ili/, /e:lu/, /emme/, /ele/, and /o:le/.

Analysis of the intelligibility ratings revealed that in the open set of response most of the words (64.45%) were rated as unintelligible. When the additional clue was provided regarding the words used to the judges, the performance improved as in the word identification task. Here 55.86% words were rated as poorly intelligible, 24.5% as unintelligible, 12.5% as fairly intelligible, 5.47% as quite intelligible and 1.56% as highly intellible.

The synthesis of speech of the hearing impaired children showed that the intellibibility, improved when the vowel durations (both in initial and final positions) were corrected and decreased when the intersyllabic pauses, average fo of the phonemes, pause and vowel durations, pause and fo vowel duration and fo and the pause, vowel duration and fo were corrected.

Thus, it was seen that the correction of some of the suprasegmental aspects of the speech of hearing impaired caused a small increase in intelligibility. It was also observed that only correction of vowel duration alone has a beneficial effect on the speech intelligibility.

The present study is in agreement with the results of the previous studies cited in the literature (Lang, 1975; Osberger & Levitt, 1979; Maassen & Povel, 1984 a, b, 1985; Oster, 1985). These studies reported that artificial correction of temporal aspects and intonation contour of deaf speech only caused a small increase in intelligibility. Maassen & Povel (1985) and Oster (1985) reported that correction of segmental errors alone caused a dramatic increase in intelligibility. (Intelligibility increased upto 66% to 97%).

Thus, on the basis of the results presented here, combined with those of some earlier studies (Obserger & Levitt, 1979; Maassen & Povel; 1984, a, b, 1985; Oster, 1985), we can conclude that no dramatic gain in intelligibility may be expected, if speech pathologists succeed in training the hearing impaired children to have better control over the suprasegemental aspects of the speech.

We can also suggest that the segmental corrections may be started first in the training program so as to get a more intelligible speech. Once this is achieved, we can go for correcting the suprasegmental aspects to have positive effects both on inteligibility and naturalness. "How to achieve this result, that is, how and to what extent these suggestions can be applied in practical speech training, especially in view of the high correlation between segmental and suprasegmental aspects in speech production, is a question that can only be solved in practice". (Maassen&Povel, 1985).

RECOMMENDATIONS

1. Similar study may be carried out for segmental corrections.
2. Similar study using sentences as speech materials may be carried out.
3. A study to find out the effect of correction of both the segmental and suprasegmental aspects of speech may be undertaken.
4. A study to establish the relative impact on intelligibility of different types of speech errors and to develop an individualized program for speech improvement would be interesting.
5. A study of larger population with suggested modifications will be useful.

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