

SPEECH DISCRIMINATION AS A FUNCTION OF AGE

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Gerontologists believe that the aging process begins even before we are born. Though some recent studies (Bergmon, 1967) indicate that our sensitivity for puretones increases till puberty and thereon there is a slight decline especially around 4 KHz. In addition to the progressive deterioration in the sensitivity for puretones generally attributed to presbycusis, the geriatric patient also typically demonstrate a reduced ability to understand the spoken language. This problem seems to be compatible with the account of puretone hearing loss.

The credit goes to Gaeth (1948) cited in Katy (1982) who for the first time conducted the study on Speech Discriminatory ability of the elderly-based. On his results he coined the term 'phonemic regression' which means the reduced ability to hear and repeat the common word at the supra threshold level which is characteristic among elderly people.

Jerger (1973) tested the phenomenon of 'phonemic regression' in 162 patients in the age range of 6 to 89 years. The effect of aging on speech intelligibility was apparent. At virtually any level of puretone average-there was systematic decrement in performance with advancing age.

Similar findings have been reported by Groetyinger (1961) Blumcn Feld, Bergman and Milner (1969), Kasden (1970) Gang (1976) where this scores decreased 10% per decades as a function of age till 8th decade and there on 18-20% per decade was noted.

Though English tests have been standardised to Indian native speakers of Indian population, no attempt has been made to find out the speech discrimination scores across the various age groups. Moreover, most often the test have been standardised on normal hearing young adults. Based on these nouns if the elderly people are evaluated, they are prone to diagnosis of handicapped even though it is normal to their age level- Thus each group should be compared with the norms of the corresponding age groups to avoid the wrong diagnosis, labelling normal aging process as abnormal.

The purpose of the present study was to provide normative data on speech discrimination as a function of age,

Methodology

Test Material : (a) Test of English ability : Developed at CIEFL.

(b) Speech material : (i) Spondee word lists CID-WI (list A was used to estimate the speech reception threshold (Hirsh, 1952) (ii) CNC monosyllables of the four lists of the Form A of the NU-auditory test No. 6 were used to test speech discrimination (Carhart and Tillman 1966).

The speech test stimuli were recorded in an anechoic chamber using the tape recorder (Grundig TK 745) with a microphone (GD SM 331).

Subjects : Seventy five male subjects who were non-native speakers of English were randomly selected. The age range was 19-77 years. The subjects were grouped into five groups with fifteen in each.

I group	19-29 years
II group	30-39 years
III group	40-49 years
IV group	50-59 years
V group	60-and above

Criteria for subject selection : (a) The subjects under the study were non-native speakers of English residing in India. (b) All the subjects were required to pass the test of English ability. (c) Normal hearing for each group was decided based on the norms given by Indrani (1981).

Test procedure : The data was collected using a two channel audiometer (Madsen OB 70) and a stereo tape recorder (Uher SG 631). The audiometer was calibrated periodically to ANSI (1971). The testing was carried out in sound treated room.

Testing involved 3 steps, (i) Pure tone threshold testing and establishment of pure tone average (ii) SRT for the better ear was established using CIOW 1 tests-subjects were familiarised with words by reading the entire list and were instructed to repeat the word. Procedure given by Rintelmann and his associates (1974) was used to determine SRT. (iii) Speech Discrimination Testing : The four tests of Nu auditory No. 6 was presented at five presenta

tion levels viz., 8, 16, 24, 32 and 40 dB SL above SRT. The test level combinations were computed using Random number later and presented accordingly.

Scoring : The data was scored based on the written response of the subject. Each correct response was given a weightage of 2%. Total percentage of correct responses at each level was computed for each list for all age groups.

Results and Discussion:

The data collected was subjected to various statistical analysis. The results of the study were discussed in the following lines.

1 Effect of sensation level : Articulation function computed for the five age groups show that the scores increase with increase in sensation level. In none of the age groups was a plateau exhibited indicating that the scores may improve further at higher sensation level. The age range, mean speech discrimination scores across all five sensation levels are illustrated in Table I—it may be noted from the Table I, that discrimination scores improve with an increase in sensation level.

2. Inter test difference: All the four tests of form A of Nu auditory test No. 6 are equivalent.

3. Age effect: From the Table I it is clear that mean discrimination scores decreased consistently as the age advances.

It is also evident that :

- (i) Group II (people in the 3rd decade) performed better than group I (2nd decade)
- (ii) Group II (3rd .ecade) did better than any other group
- (iii) Similar performances have been observed in the group III and IV (between 4th-5th decade)
- (iv) Group V (6th decade) has poor discrimination compared to all other groups. At higher sensation level very slight differences existed between the successive age groups. Thus based on these studies we can conclude:

1. Speech discrimination ability is directly proportional to the sensation level. This is true across all the age groups.

TABEE-1
Mean, Median, Standard Deviation Scores - Sensation Level Vs Age Range

Sensation Age level	10-29 years	30-39 years	40-49 years	50-59 years	60 & above
8 dS					
Mean	40.33	35.92	32.50	26.17	19.00
Median	37.0	37.50	28.00	21.00	17.00
S.D.	18.50	14.81	19.11	20.04	12.48
16 dB					
Mean	62.83	63.83	55.17	51.67	41.67
Median	65.00	64.00	56.00	58.00	48.00
S.D.	9.94	14.97	17.78	19.40	19.46
24 dB					
Mean	77.33	77.33	71.50	71.50	54.00
Median	77.00	84.00	74.00	74.00	59.00
S.D.	12.36	11.82	11.38	9.03	13.32
32 dB					
Mean	77.58	82.50	80.66	83.00	68.83
Median	78.00	86.00	80.00	84.00	66.00
S.D.	11.67	11.12	10.62	8.50	16.37
40 dB					
Mean	82.5	84.33	86.17	82.67	74.03
Median	82.00	87.00	84.00	80.00	74.00
S.D.	8.05	9.21	7.31	10.10	15.23

2. There is an inverse relation between the speech discrimination scores and the age of the individual.
3. The decrement in the speech discrimination ability was significantly greater than the younger counterparts reflecting the speech perceptual problem among the aged.

Implication of this study :

1. This present study thus yields data on speech discrimination as a function of age.
2. Gives us an idea in deciding the compensation for the noise induced hearing loss.
3. Helps in identifying the areas of deficiency (Central auditory disorders).

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