COMPARISON OF TWO HEARING AID SELECTION PROCEDURES

Reg. No. M0101

Independent Project as a part fulfilment of
First Year M.Sc, (Speech and Hearing),
Submitted to the University of Mysore,
Mysore.

ALL INDIA INSTITUTE OF SPEECH AND HEARING
MYSORE - 570 006

May, 2002

THANK YOU JESUS

Thank you Jesus for being my friend.

Thank you for all the good you send.

I' m glad, you give Appachan, Amma and Sisters in this big world

You knew just the right -home to give me.

You always know what makes me happy.

There's just one more thing I want you to know.....

Jesus : I really do love you so

Amen.


DEDICATED TO
Appachan, Amma
Chechymar
and
Angela

Certificate

This is to certify that this Independent Project entitled ***"COMPARISON OF TWO HEARING AID SELECTION PROCEDURES'"*** *is the bonafide work in part fulfilment for the degree of Master of Science (Speech and Hearing) of the student with* ***Register No. M0101.***

Mysore
May, 2002

Dr. M. Jayaram
Director
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Mysore - 570 006.

DECLARATION

This is to certify that this Independent Project entitled **"COMPARISON OF TWO HEARING AID SELECTION PROCEDURES"** is the result of my own study under the guidance of Dr. Rajalakshmi, Lecturer in Audiology, All India Institute of Speech and Hearing, Mysore and has not been submitted earlier at any University for any other diploma or degree.

Mysore
May, 2002

Reg. No. M0101

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INTRODUCTION

"The ears are the doorway to the mind. A profession that stands with the keys to mind when ears are injured should take great pride in its mission"

-Cicero

Fitting of an appropriate amplification device is a major step in the rehabilitation of the hearing impaired. It is essential for the clinician to provide optimal benefits to the client by adopting a careful and detailed hearing aid selection procedures (Ravi Shankar, Shashidhar and D'Mello, 1989).

Over the years a wide diversity of procedural options for hearing aid evaluation have been proposed. None has received universal acceptance (Pollack, 1980).

While various evaluation procedures have been suggested by clinicians and researchers else where, direct application of these methods is not feasible in the Indian context. Exigencies of time, shortage of man power and special constraints are factors to be contended in most centres (Geetha and Malini, 1986).

Regardless of fitting philosophy, audibility of speech is the important goal in the rehabilitation of hearing impaired. (Mueller and Hall, 1998).

So speech audiometry plays a significant role in the recommendation for amplification (Thibodeau, 2000).

Recent surveys show that about 70% of audiologist use speech testing to verify their hearing aid fittings (Mueller and Hall, 1998).

Most commonly used fitting procedures in India are distance method of testing (without the audiometer) and testing through the audiometer. Distance method of testing is an informal kind of testing. It is done usually in situations where double room facilities are not available or when audiometric testing cannot be done. The stimuli is presented out of the line of vision of the patient from a distance of 5 feet or 8 feet. All stimuli presented at normal conversational level (Geetha and Malini, 1986).

This procedure is very cost effective. The disadvantage of this method is the inadequate control over the stimulus intensity.

Audiometric testing is done in a double room set up. Stimuli are presented through the loud speakers in free field condition. The speakers are placed at a 45° azimuth and at a distance of 1meter away from the patient. The intensity level in the audiometer is kept at 40-45dBHL (Geetha and Malini, 1986).

Presentation level can be maintained through out the procedure. It has got more face validity.

So the present study was taken up to find out whether there is any significant difference between above mentioned selection procedures.

Need for the study

The procedures which are mentioned above have their own merits and demerits. However most of the time because of the lack of facility to do audiometric selection procedure, we tend to rely upon 8 feet or some distance procedure.

8 feet procedure is an informal procedure and the most important variable affecting this procedure is inadequate control over vocal intensity. No information is available regarding how much this particular variable affects the speech identification scores, when the 8 feet procedure is used.

Hence the need arises to compare two procedures used in hearing aid selection:selection through the audiometer and without the audiometer at 8 feet distance.

Aim : The aim of the project was to compare the hearing aid selection through two different procedures ie. selection through the audiometer and without the audiometer at 8 feet distance.

REVIEW OF LITERATURE

Over the years, a wide diversity of procedural options for hearing aid evaluation have been proposed. None has received universal acceptance (Pollack, 1980).

Hearing aid evaluation procedures utilizing speech materials are as old as hearing aids themselves (Kasten, 1980).

Speech audiometry is performed as a means for hearing aid selection. The aid with the best discrimination score is best for the patient (Green, 1987).

A variety of speech materials have been utilized for the evaluation of hearing aid performance.

Carhart (1946, cited in Kasten) utilized spondaic words and pointed out that patients were able to demonstrate differences in performance between and among different hearing aids.

Shore, Bilger and Hirsh (1960, cited in Kasten) pointed out that speech discrimination measurements (using monosyllables) either in quiet or in the presence of noise were not able to demonstrate differences in user performance with different hearing aids

Mc Connell, Silber and Mac Donald (1960) were able to demonstrate a high degree of test-retest reliability for discrimination performance by hearing aid users. They used CIDW-22 monosyllabic words.

A variety of sentence type materials have been utilized for the evaluation of hearing aid performance. Sentences are presumed to resemble conversational speech which a hearing aid user must contend with in daily living (Kretschmer, 1974).

Jerger, Speaks and Malmquist (1966) reported two investigations of aided listening performance in which they utilized sentence tests designated PAL-8. They found the sentence materials to be a more reliable and subtle measure of listener performance than conventional monosyllabic word lists, especially when applied to measurement of hearing aid performance.

Kasten (1980) stated that the purpose of the evaluation is primarily to provide a rank ordering of instrument efficiency on the basis of speech discrimination score, monosyllabic words appear to be capable of meeting that task. If the audiologist wishes to make some meaningful inferences regarding performance in more real life settings, the use of some form of sentence material are appropriate.

Hearing Aid Evaluation Procedures In Western Countries

Various procedures have been developed for comparing the relative benefits provided by different hearing aids. This kind of comparative evaluation of hearing aids using speech materials was first described by Carhart (1946, cited is Green) Carhart's original procedure consisted essentially of 5 steps.

Step 1 : Measure the subject's unaided sound field speech reception threshold, threshold of discomfort and discrimination score at a fixed sensation level (25dBSL).

Step 2 : Fit the first hearing aid for evaluation. Set the gain so that the subject reports a speech signal 40dB above normal speech threshold as being comfortably loud. Measure the aided speech reception threshold and threshold of discomfort.

Step 3 : Set the aid on maximum gain and repeat the aided speech reception threshold and threshold of discomfort.

Step 4 : Set the gain so that the subject reports a speech signal 50dB above normal speech threshold as being comfortably loud. Measure the speech reception threshold in noise.

Step 5 : Reset the aid as in step 2 and remeasure the aided speech reception threshold. Measure the speech discrimination score at a 25dB sensation level.

Step 2 to 5 is to be repeated for each hearing aid to be evaluated.

Burney (1972) suggested three basic methods used by audiologists.

1. Comparison of listener performance through audiometric procedures of one or more instruments selected by the audiologist.
2. Selection or recommendation of suitable hearing aid characteristics made by persual of audiometric results with the specific hearing aid choice left to the hearing aid dealer.
3. Use of a master hearing aid to specify from listener performance the exact hearing aid parameters to be supplied by the dealer.

84.7 percent of 176 clinics surveyed by Burney (1972) employed multiple hearing aid comparisons for purposes of hearing aid evaluation.

Roeser and Gerling (1980) gave an approach for hearing aid evaluation in which :

1. Routine pure tone testing, speech testing, impedance measurement and E N T evaluation is done.
2. Hearing aid evaluation itself is conducted in a sound field. Sound field tests are performed with the patient seated inside an acoustically treated sound suite with the test stimuli presented through the loud speakers.

3. In the sound field the following test scores are obtained without a hearing aid
   a. Speech reception threshold
   b. Speech discrimination at 50 or 60dBHL without competing stimuli.
   c. Speech discrimination at 50 or 60dB with a competing signal at one or more signal to noise ratios.
   d. Threshold of discomfort for speech.
4. Three to six aids, whose electroacoustic characteristics have been carefully measured, are placed on the patient for evaluation in the sound field.
5. Data from the four measures obtained in the unaided condition are compared to aided scores to determine how each aid affects performance.
6. After careful consideration of all data collected from the patient selection of the aid is made.

Magilen (1991) suggested distance hearing tests for hearing aid evaluation. Male and female voices are presented at twenty feet.

Thus in Western Countries, audiologists mainly use multiple hearing aid comparison for hearing aid evaluation. But direct application of above mentioned procedures are difficult in Indian context.

Hearing aid evaluation procedures in India

Most commonly used fitting procedures in India are distance method of testing (without the audiometer) and testing through the audiometer.

Present study is focussing on these two fitting procedures. This will be discussed in detail.

Stimuli are presented without visual clues. This may be achieved by the use of loud speakers or by presenting the stimuli out of the line of vision of the patient. Where unaided performance is good at a distance of 5 feet, further evaluation at a distance of about 8 feet may be tried. All stimuli may be presented at normal conversational level.

Normally oral responses are elicited. The number of correct responses for each category of stimuli is recorded. These scores must be compared to determine which aid yields the best performance (Geetha and Malini, 1986).

There is sparse information regarding the above mentioned two procedures. So the present study is taken up to find out whether there is any significant difference between these two procedures.

METHODOLOGY

30 subjects were selected for the present study. The subjects fulfilled the following criteria.

a. All the subjects had bilateral sensory neural hearing loss with the degree varying from moderate to moderately severe.

b. All the subjects had speech identification scores above 75%.

c. For all the subjects Immitance audiometry revealed no middle ear pathology.

d. All the subjects underwent an E N T check up to further rule out the presence of any external or middle ear problems.

e. All the subjects were above 18 years of age and were fluent Kannada speakers.

Instrumentation

a. The clinical audiometer (MA53) with loud speakers (MAICO SPC paired) was used for performing speech audiometry. The instrument was calibrated as per ANSI, 1996 (cited in Frank).

b. Moderate and mild gain hearing aids were used for the study. The electroacoustic properties of hearing aid were in accordance with the IS 10776:1984.

c. For clients who had their own ear molds, testing was done using those molds and for those who did not have custom ear molds, testing was done using suitable ear tips.

Test environment

- Distance method of testing was carried out in a sound treated single room.
- Selection through the audiometer was carried out in a sound treated double room.
- Ambient noise levels were within permissible limits as recommended by A N S 1994 (cited in Wilber).

Test material for speech

Paired words and everyday questions in Kannada with varying complexity, developed in the Department of Audiology, All India Institute of Speech and Hearing, Mysore were used for unaided and aided assessments. There were five lists in test material. Each of the lists had five paired words and five questions. All the lists were balanced for complexity. These lists were selected randomly (Appendix).

Instructions

For the presentation of questions, the patients were asked to answer appropriately and for paired word presentation, patients were asked to repeat verbatim.

Procedure For Distance Method Of Testing

Distance method of testing was done in a single room set up (acoustically treated). The stimuli was presented out of the line of vision of the

patient from a distance of 8 feet at normal conversational level. Speech identification scores were obtained in an unaided condition using paired words and questions from one of the lists.

Then a hearing aid was selected based on the results of audiometry and unaided speech identification scores for the patient.

Speech identification scores in aided condition for paired words and questions (using another list) were obtained.

x

Procedure For Audiometric Hearing Aid Selection

Testing was done in a double room (acoustically treated) set-up. The patient was seated in front of the loud speakers at an angle of 45°. The stimuli was presented through the loud speakers at an intensity level of 45dBHL. The speech identification scores in unaided condition for paired words and questions (using another list) were obtained.

The speech identification scores in aided condition (using the same hearing aid) and using another list were obtained.

In both procedures the questions and paired words were repeated once, when the client was not giving the correct response.

A fluent Kannada speaker presented the stimuli for all the subjects.

Scoring

A correct response for the paired words and questions were given a score of 1 and an incorrect response was scored as 0.

Data Analysis

The speech identification scores of 30 subjects were tabulated. Mean and standard deviation for paired words and questions (in aided and unaided condition) in both the procedures were calculated. The t-test was done to find out the significance of difference between means.

RESULTS AND DISCUSSION

The main aim of the project was to compare two hearing aid selection procedures i.e. selection through distance method of testing (at 8 feet distance without audiometer) and selection through the audiometer.

The data was collected based on the methodology. The mean and standard deviation (SD) values for question (Q) and paired words (PW) were tabulated for both aided and unaided condition in both the procedures:

Table A : Mean and SD values for PW in unaided condition

Variable	Mean	SD
Unaided 8 feet PW	.233	.5683
Audiometer PW	.03	.1826

Number of subjects = 30

In unaided condition, for paired words, performance is better in 8 feet procedure than in the audiometric procedure. Standard deviation values indicate that scores in audiometric procedure is less deviated than the scores in 8 feet procedure.

Table B : Mean and SD for questions in unaided condition

Variable	Mean	SD
Unaided 8 feet Q	.633	.8503
Audiometer Q	.133	.4342

Number of subjects = 30

In unaided condition for questions, performance is better in 8 feet procedure than in the audiometric procedure. Standard deviation values

indicate that scores in the audiometric procedure is less deviated than the scores in the 8 feet procedure.

Table C : Mean and SD values for paired words in aided condition

Variable	Mean	SD
Aided 8 feet PW	4.56	.6261
Aided audiometer PW	4.7	.4661

Number of subjects = 30

In aided condition performance is better in audiometric procedure for paired words. Scores in the audiometric procedure is less deviated than the scores in the 8 feet procedure.

Table D : Mean and SD values for questions in aided condition

Variable	Mean	SD
Aided 8 feet Q	4.83	.4611
Aided audiometer Q	4.93	.2537

Number of subjects = 30

In aided condition, for questions, performance is better in audiometric procedure. Scores in the audiometric procedure is less deviated than the scores in the 8 feet procedure.

The non parametric statistical analysis was carried out using the t-test (Garrett, 1966). The t-scores for both questions and paired words were calculated.

Table E : Showing significance of difference between means for two selection procedures in unaided condition

	Questions (t-score)	Paired words (t-score)
Between 8 feet distance and audiometric procedure	3.81 significant at .01 level	1.98 significant at .05 level

Table F : Showing no significance of difference between means for two different selection procedures in aided condition

	Questions (t-score)	Paired words (t-score)
Between 8 feet distance and audiometer procedure	1.140 not significant	1.278 not significant

The analysis of t-scores indicated that

a. There was no significant difference in the performance of the subjects for both questions and paired words between distance method of testing and audiometric procedure in aided condition.

The t-scores were found not to be significant at .05 level of significance.

b. There was significant difference in the performance of the subjects for both questions and paired words between the distance method of testing and audiometric procedure in unaided condition. T-scores of questions were significant at .01 level and of paired words were significant at .05 level.

Thus from the above results it has been observed that in unaided condition, there is significant difference in the speech identification scores of the

subjects for questions and paired words between the two selection procedures. This can be due to inadequate control over vocal intensity.

In the unaided condition, the speech identification scores are better in the distance method of testing. Suggesting that in the distance method of testing, subjects are getting additional clues compared to audiometric procedure. The tester might have increased the vocal intensity, when the patient was not giving the correct response.

In aided condition, there is no significant difference in the performance of the subjects for questions and paired words, between two selection procedures. It indicates that in the situations, where there are no facilities to do the audiometric procedure, if we do the distance method of testing, there should not be any significant difference in the performance of the individual.

Even though there is no significant difference between these two procedures in aided condition, speech identification scores are better in audiometric procedure. This can be due to the transmission loss present in the distance method of testing. In the audiometric procedure, as the stimuli are presented, directly through the loudspeaker, there may not be any transmission loss. This can be explained based on inverse square law which states that the intensity of the sound decreases proportionately to the square of the distance from the sound source (Martin, 1994).

In both aided and unaided condition, deviation of scores is less in audiometric procedures suggesting less variability in the performance of the individuals. This can be due to the maintenance of constant intensity level during the testing of all the subjects.

Hence from the result of the present study it can be concluded that we can use either of the methods for hearing aid selection. Further better speech identification scores can be established using audiometric procedure in aided condition. This could be due to less variability in vocal intensity and absence of transmission loss.

SUMMARY AND CONCLUSION

The successful rehabilitation of hard of hearing individual hinges primarily on the selection and fitting of an appropriate amplification device.

Several procedures for hearing aid evaluation have been put forth in the past decade. But the direct application of these methods is not feasible in the Indian context (Geetha and Malini, 1986).

Most commonly used fitting procedures in India are distance method of testing (without the audiometer) and testing through the audiometer.

There is sparse information available regarding the above mentioned two selection procedures. So the objective of the present study was to compare the hearing aid selection through two different procedures i.e. selection through the audiometer and selection without the audiometer at 8 feet distance.

The speech identification scores in unaided condition for paired words and questions in Kannada at 8 feet distance and through the audiometer without visual clues were obtained. Hearing aid was selected based on the unaided scores and the audiometric results for the subjects. Speech identification scores through the audiometer without visual clues were obtained.

Data analysis was done to find out significant difference between means. The results of the present study are :

1. In unaided condition, there is significant difference in the speech identification scores of the subjects for questions and paired words between the two selection procedures.
2. In the unaided condition, the speech identification scores are better in the distance method of testing.
3. In aided condition, there is no significant difference in the performance of the subjects for questions and paired words between two selection procedures.
4. In aided condition, speech identification scores are better in audiometric procedures.

Hence from the results of the present study, it can be concluded that we can use either of the methods for hearing and selection, as there is no significance of difference between these two methods in aided condition. Further better speech identification scores can be established using audiometric procedure in aided condition. This could be due to less variability in vocal intensity and absence of transmission loss.

BIBLIOGRAPHY

1. Burney, P.A. (1972). A survey of Hearing Aid Evaluation Procedures. ASHA. 14. 439-444.
2. Frank, T. (2000). Basic Instrumentation and calibration. In R.J. Roeser., M. Valente. and H.H. Dunn (Eds.). Auditory Diagnosis, (pp.213-225). New York: Thieme Medical Publishers.
3. Garrett, H.E. (1966). Statistics in Psychology and Education. New York : David Me Kay Company, Inc.
4. Geetha, M., and Malini, M.S. (1986). Strategies for Hearing Aid Evaluation In India. Hearing Aid Journal. 4, 93-95.
5. Green, R. (1987). The uses and misuses of speech audiometery in Rehabilitation. In M. Martin. (Eds.), Speech Audiometry. (pp. 129-153). London and New Jersey : Whurr Publishers Ltd.
6. IS documents. 10776 : (1984). Electroacoustic properties of hearing aids.
7. Jerger, J., Speaks, C, and Malmquist, C. (1966). Hearing Aid Performance and Hearing Aid Selection. Journal of Speech and Hearing Research. 9, 136-137.
8. Kasten, R.N. (1980). Speech Protocols for Hearing Aid Evaluations. In R.R. Rupp and K.G. Stockdell. (Eds.), Speech Protocols in Audiology. (pp. 281-306). New York, London, Toronto, Sydney and San Francisco : Grune and Stratton Inc.

9. Kretschmer, L. (1974). Evaluation Procedures for Adults. In K. Donnelly. (Ed), Interpreting Hearing Aid Technology, (pp. 125-158), Springfield and Illinois: Charles. C. Thomas. Publisher.

10. Magilen, G. (1991). The Guided Selection Method of Hearing Aid Fitting. Audecibel. 11,16-20.

11. Martin, F.N. (1994). Introduction to Audiology. New Jersey : Prentice Hall.

12. Me ConneH F., Silber, E., and Mac Donald, D. (1960). Test-retest consistency of clinical hearing aid tests. Journal of Speech and Hearing Disorders. 25, 273-274.

13. Mueller, H.G, and Hall, J.W. (1998). Hearing Aids: Fitting and Verification. In H.G. Mueller and J.W. Hall. (Eds.), Audiologist's Desk References. Vol. II. (pp. 167-252). San Diego and London : Singular Publishing Group.

14. Pollack, M.C. (1980). Practical and Philosophical Considerations. In M.C. Pollack (Eds.), Amplification for The Hearing Impaired, (pp. 115-142). New York, London and San Francisco : Grune and Stratton Inc.

15. Ravishankar, K.C., Shashidhar, K.N, and D'Mello, J. (1989). Functional gain with moderate and strong class hearing aids. Hearing Aid Journal. 6, 31-39.

16. Roeser, R.J. and Gerling, I.J. (1980). Hearing Aids. In R. W. Keith, (Eds.), Audiology for the physician, (pp. 239-265). Baltimore and London : The Williams and Wilkins Company.

17. Thibodeau, L.M. (2000). Speech Audiometry. In R.J. Roeser, M. Valente. and H.H. Dunn. (Eds.). Auditory Diagnosis, (pp. 281-309). New York and Stuttgart: Thieme Medical Publishers.

18. Wilber, L. A. (1994). Calibration, Puretone, Speech and Noise Signals. In J. Katz (Ed). Handbook of Clinical Audiology. (pp. 73-97). Baltimore, Philadelphia, Hongkong, London, Munich, Sydney and Tokyo : Williams and Wilkins.

APPENDIX

Set A **Questions**

1. nimma tandeja hesaru e:nu ?
2. ni:vu illige basalli bandra: ?
3. ni:vu ra:tri eʃṭu gaṇṭege malugutira:?
4. nimma u:ru ja:vaḍu ?
5. ni:vu belage e:nutiṇḍi tiṇḍri ?

Paired words

be:le	-	ka:lu	gaṇṭu	-	mu:ṭe
hola:	-	gaddḷe	atta	-	itta
sutta:	-	mutta:			

Set B **Questions**

1. nimage eʃṭu varʃa ?
2. nimma hesaru e:nu ?
3. nimage ja:va kivijalli tʃanna:gi ke:luṣuṭe ?
4. ni:vu e:nu kelasa ma:duṭira ?
5. nimage ja:va ja:va ba:ʃe baruṭe: ?

Paired words

ka ta	-	suka	ta:ji	-	tande
anḍa	-	tʃanḍa	hotte	-	batte
naḍe	-	nuḍi			

SetC Questions

1. nimage eʃṭu ʤana akka ṭangijaru iḍḍa:re ?
2. i:ga gaṇṭe eʃṭu ?
3. manejalli ja:va ba:ʃe ma:ṭanaḍuṭi:ra ?
4. ni:vu e:nu o:ḍiḍi:ra ?
5. nimma manejalli eʃṭu ʤana iḍḍa:re ?

Paired words

aṭi	-	a:se	mane	-	mat^{h}a
kappe	-	tʃippu	namma	-	nimma
guru	-	ʃiʃya			

Set D Questions

1. ni:vu belage eʃṭu gaṇṭege eluṭi:ra ?
2. nimma manege basalli/ oto:ḍalli ho:guṭi:ra ?
3. nimage eʃṭu ʤana aṇṇa .ṭammanḍiru iḍḍa:re ?
4. nimma mane ellide ?
5. nimma ʤote ja:ru bandidare: ?

Paired words

ṭindi	-	ṭi:rṭa	saṇṇa	-	puṭṭa
alli	-	illi	kanasu	-	nanasu
kallu	-	maṇṇu			

Set E Questions

1. nimma ṭa:jina hesaru e:nu ?
2. ivaṭu ja:va va:ra ?
3. ni:vu kofi aṭava ti: kuḍiti:ra ?
4. nivu illige eʃṭu gaṇṭege baṇḍi ?
5. nimage ja:va:galinda kivi ke:lusuṭa:illa: ?

Paired words

mi:na	-	me:ʃa	tʃinna	-	beḷḷi
beṭṭa	-	guḍḍa	aṭṭa	-	iṭṭa
hetʃu	-	kammi			