

## INFLUENCE FROM DIALECTAL BACKGROUND ON THE SCORE IN HEARING TESTS EMPLOYING SPEECH STIMULI

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### 1. Introduction

The purpose of an audiometric test is, of course, to investigate certain aspects of the hearing ability of the person taking the test. In practice, however, the result of an audiometric test will also depend on factors which are not directly related to the auditory mechanism. Thus, when speech segments such as single words or sentences are used as stimuli in the test, the test-score will also be determined by e.g. the subject's vocabulary, intelligence, education, and dialect. In extreme situations these factors may even be dominating.

#### 1.1. Procedure

In the winter of 1971/72 a series of experiments were carried out at The State Hearing Center, Bispebjerg Hospital, Copenhagen. A stimulus material consisting of 100 short interrogatory sentences had been constructed and a TV video-recording of this material read by a female speaker<sup>1)</sup> was made. The stimuli could be presented audio-visually (by means of a TV-monitor and a loudspeaker) or auditorily (by means of the loudspeaker only). The stimuli were presented in one loudspeaker and a noise signal in 4 others placed round the subject. The speech level was kept constant throughout the experiment (approximately 55 dB) and different signal to noise ratios were obtained by attenuating the noise signal.

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1) The speaker's dialect was close to Standard Copenhagen.



## 1.2. The subjects

48 subjects participated in the experiment. These were selected from 80 volunteers<sup>2</sup> on the basis of audiological, optometrical, and psychological tests. These tests assured that all the subjects participating in the experiment were of normal hearing, sight, and intelligence. All subjects had lived for a period of at least one year in the Copenhagen area, but a substantial part of the subjects were born and grown up outside this area.

## 1.3. Variation of test-scores obtained

In the light of the careful pre-testing of the subjects, the test-scores obtained showed a considerable degree of variation: Subjects tested with exactly the same stimuli, order of presentation, signal to noise ratios etc. obtained radically different scores. As we were firmly convinced that this variation was not attributable to organic differences in the hearing mechanisms, other possible sources of variation had to be examined. One of these was the dialectal background of the subjects.

## 2. Dialectal background of the subjects

### 2.1. Collection of data

Inquiry forms were sent to each of the 48 subjects, and 24 of these returned the forms duly filled in. The inquiry forms gave information about the place of birth and childhood of the subjects and their parents, and of the places where the subjects had lived for longer periods. On the basis of these

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2) Mainly students at a teachers' training college or a nursing school.



inquiry forms the 24 subjects were divided into two groups. The first contained subjects born and grown up in Copenhagen and the second, subjects born and grown up outside the Copenhagen area (in cases of doubt, information on the subject's parents was used to determine the grouping).

## 2.2. Statistical treatment

In the test the subjects were divided in groups each containing 6 subjects, and the members of each group were tested with the same stimuli and the same S/N. The subjects were ranked from 1 to 6 according to their test results: In each group the subject who answered the largest number of questions correctly was given number 1, and the subject who obtained the lowest score was given number 6.

TABLE 1 shows how the rankings were distributed among the two groups. Mann-Whitney's U test shows that at the 99.9% level subjects from GROUP 1 are higher ranked than subjects from GROUP 2.

TABLE 1

The ranks of the 12 subjects born in Copenhagen (i.e. GROUP 1) and the ranks of the 12 subjects born outside Copenhagen (i.e. GROUP 2)

	GROUP 1	GROUP 2
RANK	NUMBER OF SUBJECTS	NUMBER OF SUBJECTS
1	5	0
2	3	2
3	2	2
4	2	2
5	0	4
6	0	2



### 2.3. Conclusions

The main difference between the groups 1 and 2 seems to be that the persons in group 1 speak the same dialect as the speaker employed in the test (i.e. Standard Copenhagen) and the remaining subjects, presumably, speak dialects differing from this in various degrees.

As persons born in Copenhagen are ranked higher than persons born outside of Copenhagen it seems likely that a person's dialectal background influences his ability to understand speech presented in noise.

The clear tendency shown in table 1 must, however, be viewed in the light of the extremely homogenous group with respect to other factors influencing the test score. In practice a major part of the variation will be caused by hearing disorders and the influence of other factors may be negligible.

However, the subjects employed in this test were familiar with the dialect of the speaker. A stronger influence will inevitably be found among the clientele of a hearing center.

This problem will be given further attention in subsequent tests.

### Acknowledgements

This work was supported by William Demant and wife Ida Emilie's Foundation, the Danish Research Council for the Humanities, and the Danish Medical Research Council.