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STUDIES OF SPOKEN LANGUAGE COMPREHENSION IN L2 SPEAKERS

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Abstract

A progress report is presented which deals with the ability of L2 speakers to understand spoken L2. This work has been carried out in the larger context of research on comprehension testing for which L2 speakers were judged to be appropriate subjects due to their special communication situation. Experiments were carried out with L2 speakers and native speakers of Swedish to determine speech reception threshold in noise. It was found that the noise had a larger negative effect on the L2 speakers comprehension ability when compared to the native speakers. Work currently in progress is also summarized. This continuation involves giving L2 speakers various tests and comparing test results in various ways.

INTRODUCTION

This paper is a progress report on ongoing research within the field of speech comprehension testing. The pilot studies reported on here and the research plans that are mentioned are included in a planning project financed by the Swedish Research Board (FRN). The overall aim of this project is to develop methods for the measurement of speech comprehension. The planning phase, which has taken place during the academic year 1988-89 has included 3 main parts: (1) An inventory of the need for comprehension tests. (2) An inventory of available tests and testing methods. (3) Pilot studies using available experimental methods and new variants of available methods.

Our study of the need for these tests has revealed that tests which measure comprehension of spoken language are needed in at least 3 areas: 1) Speech and language research, 2) Audiology, 3) 2nd and foreign language learning. Our inventory of test methods currently available was carried out with special attention being given to test validity. We found that test validity in comprehension tests could probably be enhanced by the development of tests which make more extensive use of the results of modern linguistic and phonetic research on speech and language perception. The research dealt with here on the comprehension ability of L2-speakers is part of the pilot work that has been done and is being planned in the context of this larger project.

The testing of L2 speakers comprehension of spoken language has most often been carried out in an L2-learning setting. These tests have been used as diagnostic tools and as a measurement of language proficiency (Lado, 1961; Valette, 1967; Gradman & Spolsky, 1975). We chose L2-speakers as one group of appropriate subjects in our pilot experiments. These language users gave us the possibility to examine a group which we assumed had a particular problem with the use of signal independent information in the comprehension process when compared to native speakers. We hoped that our use of this group might shed light on two main problems in connection with the investigation of language comprehension. First, would it be possible to measure the ability of L2-speakers to understand spoken L2 so as to reveal the nature of some perceptual aspects of their mastery of L2 - their "perceptual foreign accent"? Second, could we use comprehension testing methods to quantify the communicative consequences of production
aspects of foreign accent? The answers to these questions would not only further our knowledge of comprehension in general and in particular the role of signal independent information in the understanding process, they could also demonstrate some aspects of the communicative status of L2-users and thereby contribute to goal specification in the teaching/learning of a second language.

METHODS
Two related test methods were used in these pilot experiments. The first of these was a variation on the SRT-related method used by Walker & Byrne (1985). The other method which we ourselves developed was also based on the "threshold of perceptibility" principle but we used Helen-test questions (Ludvigsen, 1974) as a more objective means to determine if subjects actually understood the message (McAllister & Dufberg, 1989). The general experimental configuration can be seen in Fig. 1.

Fig. 1.

We used two types of noise in these experiments. One was the same noise used by Hagerman in the development of his speech test (Hagerman, 1984). This noise has speech spectrum characteristics and is amplitude modulated. "Cocktail party noise" was also used. This noise was made by rerecording and mixing the recorded speech material used in the test so that the same material was superimposed upon itself a total of 24 times.

Our subjects were four L2 speakers, foreign students at Stockholm university, with a good knowledge of Swedish and four native speakers who were members of our staff or students.
RESULTS AND DISCUSSION
A summary of the results are presented in Fig. 2.

Fig. 2.

It should be noted that our expectations were that the L2 speakers would be less tolerant of noise than the native speakers, or in other words, their comprehension ability would be more negatively affected by masking noise. That is to say that we have assumed that these language users suffer from a perceptual perturbation with, in effect, the same consequences as, say, hearing loss but which has its source in the use of the signal independent information. In this case that information is reduced by a grasp of the language that is less firm than that had by native speakers. As the signal is masked in these experiments, the native speakers are able to tap their reserve of signal independent information and experience. Lacking this, the L2 speakers should exhibit more difficulty in dealing with the masked speech signal. There seems indeed to be support for this reasoning in our results. The SRT-results for the L2 speakers show that they perform consistently worse than the native speakers. This may indicate that "foreign accent" entails not only a deviation from the production norms of the target language but also could involve deviant perceptual behaviour.

Further, our results indicate that the babbling noise may be a somewhat more effective masker than the Hagerman noise (the reader is kindly referred to a discussion of noise type in the results of these experiments in McAllister & Dufberg, 1989).

We judged the Helen method as having at least more face validity than the SRT method because it eliminated variation caused by subjective judgements of comprehension level on the part of the subjects. However, the correlation between the scores for the two tests was found to be low, \( r = .50 \) for babbling noise, .38 for Hagerman noise.)
FURTHER EXPERIMENTS
At the Fonetik -89 meeting in Stockholm we hope to present further results from this ongoing research. At present (March '89) we are conducting experiments with L2-speakers as a continuation of our investigation of foreign accent and comprehension testing.

Methods
Five L2 speakers and five native speakers are being tested using various methods.

- Standard audiological tests including SRT (Swedish:HTT), discrimination ability (D), and the Hagerman test.
- The combination of SRT and Helen test described above.
- HPI test (Hearing Performance Inventory): A self-assessment test in which subjects, through a paper and pencil questionnaire estimate their comprehension ability in various everyday situations.
- Token test. This test, used widely by speech therapists, is a controlled communication game scored by an observer/experimenter. Its results would indicate global language comprehension ability.

Also included are tests of the relation between production and perception of L2 speakers. Their foreign accent is judged by a panel of experts (L2 teachers of pronunciation) and the communicative quality estimated by means of a reduced redundancy test (Gradman & Spolsky, 1975). After these tests have been administered the results will be compared in various ways both statistical and non-statistical.

We hope these pilot studies will further our knowledge of both L2 speakers production and perception performance and comprehension testing methods, and would like to stress that the main function of this research is to indicate fruitful directions for further work in this field. We hope we have interesting results to present when we meet at FONETIK -89.

References