

COMPENSATORY ARTICULATION AND NASAL EMISSION OF AIR  
IN CLEFT PALATE SPEECH  
WITH SPECIAL REFERENCE TO THE REINFORCEMENT THEORY

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ABSTRACT

It has been assumed that the compensatory speech habits developed in some children born with cleft palate may to some extent be explained by a reinforcement effect induced by the environment on the speech of the cleft palate child due to a perceptual preference of its environment. This is called the reinforcement theory. The results of the present study seem to support the theory and that the mother's education may be one relevant factor.

1. INTRODUCTION

Speech produced by speakers with velopharyngeal insufficiency is always more or less characterized by nasalization. Further, the speech is frequently characterized by nasal emission of air influencing primarily the obstruents ('pressure consonants'). However, some children develop compensatory sounds in the sense that obstruents normally produced at or in front of the velopharyngeal valve are here produced behind this valve. The resulting compensatory sounds are primarily glottal stops and pharyngeal fricatives. This way of speaking results in more or less unintelligible speech. On the other hand,

on the surface it may seem more distinct to the listener than speech dominated by nasal emission of air.

It has been hypothesized that compensatory speech is almost always learned and reinforced in infancy and early childhood (1). In other words, according to this assumption the compensatory speech habits learned during language development may be due to the perceptual preference of its environment. The theory to the effect that perceptual preference of the environment leads to a reinforcement effect on the speech of the cleft palate child is called the reinforcement theory.

The purpose of the present study is to investigate the parental perceptual preference between compensatory articulation and nasal emission of air in order to deliver support for or to invalidate the reinforcement theory. Since only some (few) children born with cleft palate, rather than most of them, develop compensatory articulation patterns, listeners are, according to the theory, supposed to differ as to their preference of cleft palate speech mode. Thus, it

seems relevant to determine if there are some factors which correlate with the parental preference. One such factor could be the social status of the parents, another the parents' education. Further, in order to be comparable with parents of new-born children with cleft palate, the listeners should be parents of normal children, since both of these groups are supposed to be equally unfamiliar with cleft palate speech. The compensatory articulation starts and progresses during the babbling period and in the very early speech period, where intelligibility in a narrow linguistic sense is irrelevant. Therefore, in order to eliminate the influence from the different intelligibility of the two speech modes, the parents were asked to listen to nonsense words.

2. METHODS

The test included 10 different nonsense words said in the two speech modes. Both speech modes were clearly hypernasal and the most frequent compensatory sound was a glottal stop. The parent listeners comprised only mothers as the mother is normally more in contact with the baby than the father, and thus has greater influence on the child's development, including its linguistic development. The 54 listeners were distributed as follows: 33 mothers, 10 non-educated female cleaners and 11 female school teachers. The mothers were categorized into three groups according to income and into three groups according to education. The teachers and cleaners were included in order to highlight the education factor.

The test tape was individually presented to each subject and the question was: 'Which of the two pronunciations would you prefer, if you were talking with the speaker that you hear on the tape?'.

3. RESULTS

In the following, C and E are used for 'compensatory' and 'nasal emission of air', respectively. The results of the C-answers in per cent of the total number of answers are depicted in the figure. In general the listeners prefer the E-pronunciation as the C-score is less than 50% averaged over all the listeners, but differences between various groups of listeners can be observed. With the group of mothers there are 38% C-answers, but a clear intergroup variation is seen: in the (1) high income group there are 59% C-answers, in the (2) average income group 32%, and in the (3) low income group 20%. Thus, the number of C-answers given by the mothers seems to be somewhat related to their social status, even though only the difference between the high and the low income is clear-significant. Also, the behaviour of the mothers varies according to their education: (1) educational/social training, (2) university training, and (3) other. It is seen that the C-score is highest with the mothers with educational/social training (56%), followed by the mothers with university training (36%), and the rest group (28%), even though only the groups with the highest and the lowest scores are significantly different. Finally, the C-score is substantially higher with the teachers

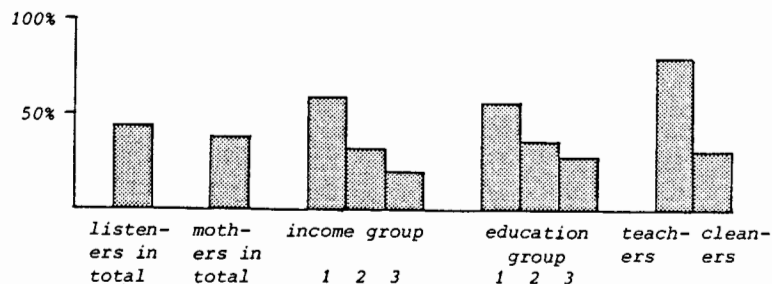
than with the cleaners, and the difference is highly significant. Notice that the behaviour of the teachers are evidently different from all other groups, whereas the behaviour of the cleaners is within the range of the mothers.

#### 4. DISCUSSION

The purpose of the present study was to throw light on the following question: Is the parental preference between compensatory articulation and nasal emission of air influenced by social status and education? From the results it can safely be concluded that the mothers do not behave alike in their choice between the two speech modes, and that one factor seems to be the social status of the listeners, at least when defined as level of income. Also, the results seem to indicate that education may be a relevant factor. It should be noticed that the mothers with university training and the group including other types of training tend to behave very much alike. This indicates that it is the specific type of training that is the relevant

factor, rather than the level of training, even though the few data in the group of university mothers should be taken into consideration. But the finding that the score obtained by the non-educated cleaners is very similar to the scores obtained with these two groups of mothers, also points in the same direction. It should be added that there is no simple relationship between the three categories of social status and the three categories of education.

Now, do the results support the reinforcement theory? Three groups were more inclined to choose the compensatory speech mode, namely mothers of high social status, mothers with educational/social training, and school teachers. Thus, mothers belonging to these groups should be potential candidates for reinforcing speech with compensatory articulation. Therefore, we checked the files covering a period of 25 years regarding the distribution of cleft palate children with and without glottal stop compensations on mothers of high



The C-answers in per cent of the total number of answers given by various groups of listeners.

versus low social status and mothers with educational/social training versus other kinds of training. As to the educational factor, the occurrence of glottal stop compensations are significantly higher with the children of educationally/socially trained mothers than with the other group including children of mothers with university training and other trainings. On the contrary, the material shows only a slightly higher occurrence of glottal stop compensations with the high than with the low income group, and the difference is not significant.

Finally, some American studies (1,3) apparently also deal with parental preference and the two cleft palate speech modes. However, after we have listened to the American test tape we think that they have examined other speech phenomena. This stresses the need for international agreement on definition of universal speech symptoms, so that research can be compared.

To conclude, the results of the present study seem to support the assumption that reinforcement may be a relevant factor and that the type of mother's education may be a reinforcing element. But it should be emphasized that the causal relation between the two kinds of observations - preference and frequency of occurrence within specific groups - is not necessarily one of reinforcement. It is probably too simplistic to assume that reinforcement, if it occurs at all, is the singular, or even the strongest, factor influen-

cing the development of compensatory articulation. But apart from the conclusions about the reinforcement factor which may be drawn from the current study of preference, it is interesting that listeners' preference between the two deviant speech modes differs according to education and social status. It has been shown that listeners' judgments about the speakers personality and appearance are more negative when listening to voice disorders, including hypernasality, than to normal voice quality. Therefore, it seems likely that when unaware of the poor intelligibility of compensatory speech some listeners may find it more positive (or less negative) than speech with nasal emission of air. But as far as we are informed the literature does not report on the relationship between such judgments and the social status and the education of the listeners.

#### 5. REFERENCES

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