

# Bioelectric Activity of the Articulation Muscles in Deaf Children

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## 1. Introduction

M. orbicularis oris of the mouth was examined in 10 children with hearing impairment. Their age ranged between 13-14 years. The results obtained were compared with control electromyograms which were made with 3 children with normal hearing and speech.

## 2. Method

The bioelectric activity was registered on a DISA electromyograph using surface electrodes. The utterances were simultaneously recorded oscilloscopically and on the tape recorder. The test included vowels in the following order: a, e, i, a, o, u\*, which were read from a separate sheet first and then repeated with moderate voice intensity.

## 3. Results

In view of the limited size of the paper, material will be exemplified by records of bioelectrical activity from the circular muscle of the mouth in deaf children while they were reading alone.

In normally hearing children the bioelectrical activity is illustrated by Figures 1 and 2.

Ad Fig. 1: With vowels e, a, the activity is absent, with i only slight activity is present.

Ad Fig. 2: Activity appears before articulation of o, u to involve the articulation phase itself; it appears and vanishes gradually, and reaches its maximum with articulation of u. In the deaf children desorganization of the bioelectrical activity with its pronounced enrichment is a predominant feature at the time of reading the vowels, this variability being clear-cut mainly before their articulation. This may be either a synchronic activity in the form

\* a - in Engl. e.g. corresponding to a in car,  
e - in Engl. e.g. corresponding to e in pen,  
i - in Engl. e.g. corresponding to i in sea,  
o - in Engl. e.g. corresponding to o in pot,  
u - in Engl. e.g. corresponding to u in put.

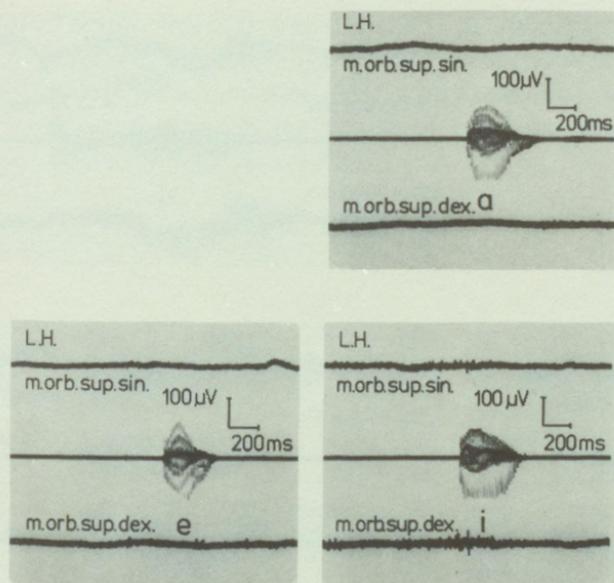


Fig. 1.

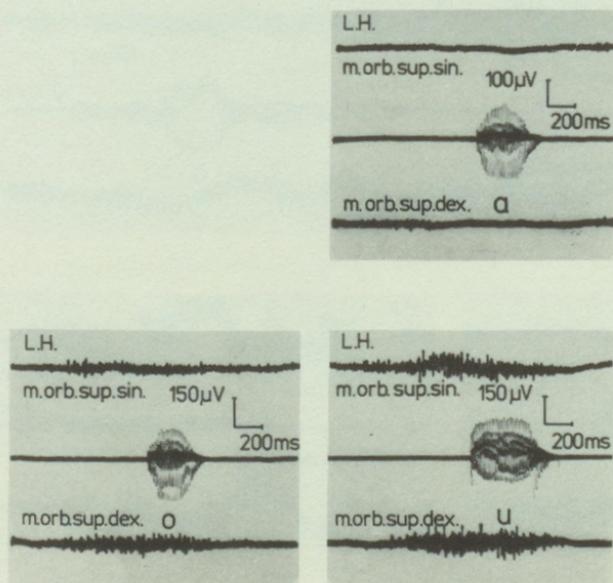


Fig. 2.

of volleys or potential groups (Fig. 3), or asynchronous (fig. 4) when alternative continuous activity in the form of interferential or indirect record corresponds with a low interference, or electrical silence. During articulation itself the bioelectric activity is basically synchronic but very rich, as compared with that of hearing persons. It lacks, however, an explosive character. Interferential records prevail, especially in the first articulation phase.

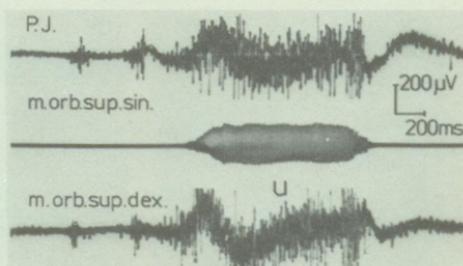
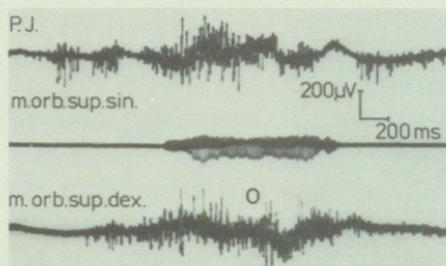
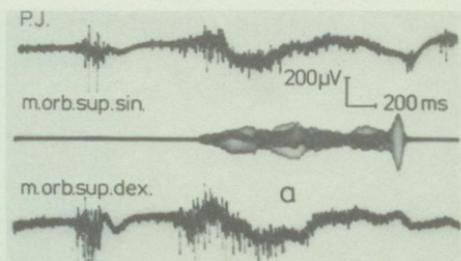


Fig. 3.

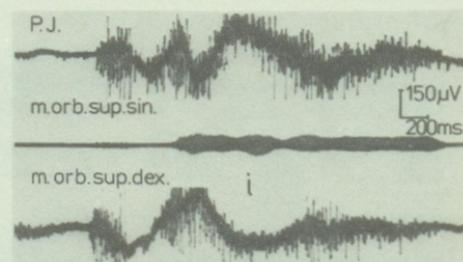
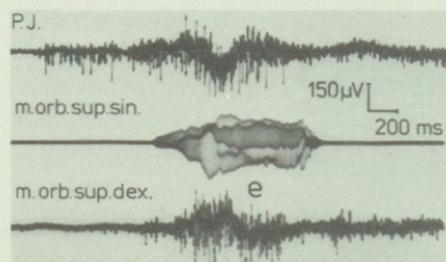
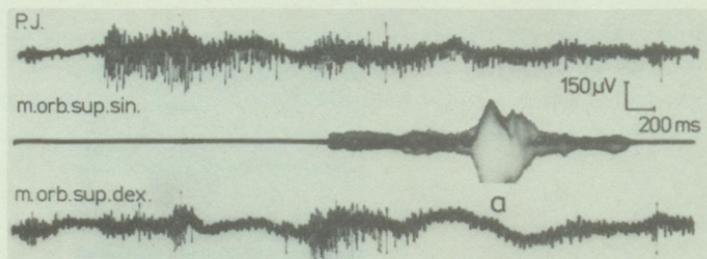


Fig. 4.

#### 4. Conclusions

1. The bioelectrical pattern of the circulatory muscle of the mouth in deaf children's reading task differs from that in children with normal hearing, with no relationships existing between them.
2. The pattern itself is highly differentiated; though some regularities can be distinguished in prearticulation and articulation phases.

3. The bioelectrical activity in the prearticulation phase of deaf reading children, which during repetition tends to vanish or reappear immediately before the articulation itself, with a loss of its variability, might be due to superposition on the action of speaking of an additional intellectual operation such as reading.