

A COMPLEMENTARY RELATIONSHIP BETWEEN LIP AND JAW MOVEMENTS
DURING ARTICULATION

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It is generally considered that, since the lower lip is attached to the jaw, lip movement is parallel to that of the jaw.

Observations, by means of cineradiography, of timing and distance of the labial and mandibular movements during running speech suggest that, while the two mechanisms behave in coordination, they also behave in a complementary manner in certain cases.

It was noted, for example, during the V_1CV_2 portion of utterances where C is a labial stop, that while the lower lip moved up (for the closure of a labial stop) and down (for the release), the jaw remained stationary during these lip movements but was moving during the labial closure, i.e. while the lip position was stationary. This complementary relationship is shown below:

	V_1	C	V_2
Lip	Moving	Stable	Moving
Jaw	Stable	Moving	Stable

Two explanations are possible. One is to suggest that while the lips are actively engaged in consonantal articulation, the jaw is rather passive during this time but is active in the positioning of the tongue for the target vowel height. This supports a view (e.g. Lindblom 1967) that there is a closer relationship between vowel height and jaw height than between the former and tongue height.

Another possibility is to attribute the observed phenomenon to mandible coarticulation, i.e., during the labial occlusion the jaw moves, in anticipation, toward the position of the following vowel. Since vowel articulation is in fact facilitated in just this way, one can even argue that mandible coarticulation is an organized principle in speech production.

Further study is needed to determine whether the complementary relationship observed here between the labial and mandibular movements is attributable to this organizing principle of coarticulation or to their differential behavior with respect to consonants and vowels. It is our hope to include in the final report (come August 1979) a detailed comparison of the labial and mandibular movements with that of the tongue so that the question raised may be resolved.

Reference

Lindblom, B. (1967): "Vowel duration and a model of lip-mandible coordination", STL-QPSR 4, 1-29.