

THREE SOURCES OF INFORMATION IN VOWEL IDENTIFICATION

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Three studies investigated the sources of information used by listeners to identify vowels spoken in syllabic contexts. Traditional theory holds that target formant frequencies are most important in vowel identification. Recent research suggests, however, that dynamic information plays an important role in determining accurate identification.

Stimuli

Native English speakers recorded b-vowel-b syllables for 9 or 10 vowels. These syllables were electronically processed in various ways to (1) delete the formant transitions, (2) delete the syllable centers, leaving only the initial and final transitions, and (3) distort or eliminate the differential duration information. Separate identification tests were prepared for each condition.

Subjects

Independent groups of naive listeners (college students) attempted to identify the vowels.

Results

Errors were scored if the listener reported other than the intended vowel. Error patterns in all three experiments were highly similar. Unmodified syllables, of course, had the lowest error rate, but syllables from which the center had been deleted were almost as good. Identification of the syllable centers without transitions was somewhat poorer. When these centers were given constant duration, identification was extremely poor. Changing the duration of silence in the syllables which had centers deleted produced an intermediate level of errors.

Conclusion

Formant transitions and durational information are important sources determining accurate vowel identification. Formant center frequencies alone, stripped of dynamic information, are relatively poor sources of identification information.