

**6.542J, 24.966J, HST.712J LABORATORY ON THE PHYSIOLOGY,
ACOUSTICS, AND PERCEPTION OF SPEECH
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Lab 10

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Sound Segment Reduction

References

Oshika, B.T., V.W. Zue, R.V. Weeks, H. Neu and J. Aurbach (1975) *The Role of Phonological Rules in Speech Understanding Research*, **IEEE Transactions on Acoustics, Speech, and Signal Processing, ASSP-23**, No. 1, 104-112.

Manuel, S.Y., S. Shattuck-Hufnagel, M. Huffman, K.N. Stevens, R. Carlson and S. Hunnicutt (1992) *Studies of Vowel and Consonant Reduction*, **Proc. International Conference on Spoken Language Processing, Vol. 2**, 943-946.

Procedure

In this lab, you will record, display, edit, and create a listening test for an informal perceptual experiment. The spontaneous speech material recorded earlier in Lab 1 will be studied in order to assess the kinds of modification present in the speech and to determine the intelligibility of brief excerpts of continuous speech in which the sounds have been modified by surrounding context. You will find and excerpt words that have been modified, analyze their acoustic shape, and later we will present them for perceptual identification.

During the laboratory period, each group will do the following tasks.

1. Listen to the spontaneous speech recorded in Lab 1. Select a section of this, approximately 5 seconds (\pm 1-2 seconds). Make spectrograms of this section.
2. Label as best you can where the words are: mark the middle of vowels. Indicate cases where there does not appear to be a separate peak for the vowel.

3. For each consonant (except glides and /r/) that is next to a vowel (either preceding a vowel or following a vowel or both) observe whether there is an acoustic discontinuity at this vowel-consonant interface, and mark these points on the spectrograms.
4. For a few of the deviant examples in section 2 and 3 above, discuss the reason or reasons for the deviation; e.g., reduced vowel, overlap of articulatory gestures, omission of a gesture, mark of a pause, etc.
5. In the entire spontaneous speech file, find 3 words that appear not to be modified appreciably, and another 3 where there is some deviation from the expected pattern. Excerpt these 6 words from the utterance, store them as separate files, and label them as group x a through group x f, where x is your group number.
6. We will organize these excerpts into a listening test which we will run at a future lab session on speech intelligibility. This listening part of the lab should be reported later.