1aSC12. Effects of emotion on different phoneme classes.

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This study investigates the effects of emotion on different phoneme classes using short-term spectral features. In the research on emotion in speech, most studies have focused on prosodic features of speech. In this study, based on the hypothesis that different emotions have varying effects on the properties of the different speech sounds, we investigate the usefulness of phoneme-class level acoustic modeling for automatic emotion classification. Hidden Markov models (HMM) based on short-term spectral features for five broad phonetic classes are used for this purpose using data obtained from recordings of two actresses. Each speaker produces 211 sentences with four different emotions (neutral, sad, angry, happy). Using the speech material we trained and compared the performances of two sets of HMM classifiers: a generic set of ''emotional speech'' HMMs (one for each emotion) and a set of broad phonetic-class based HMMs (vowel, glide, nasal, stop, fricative) for each emotion type considered. Comparison of classification results indicates that different phoneme classes were affected differently by emotional change and that the vowel sounds are the most important indicator of emotions in speech. Detailed results and their implications on the underlying speech articulation will be discussed.