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BINDING MECHANISMS IN SPEECH PROCESSING *Maria Chait*[1], *Steven Greenberg, Takayuki Arai*[2], *David Poeppel*[1], [1]*University of Maryland College Park,* [2]*Sophia University, Tokyo, Japan* – A growing body of research in speech processing is pointing to the perceptual reality of both ~40ms and ~300ms windows of integration that correspond to the extraction of segmental and suprasegmental information from a speech stream. In this study we propose a new method of systematically examining the extraction and subsequent combination of these informational constituents of speech. The original wide band speech signal is split into 14 frequency bands with an FIR filter bank spanning the range 0-6kHz spaced in 1/3 octave steps along the cochlear frequency map. The amplitude envelope from each band is computed by means of a Hilbert transform and then either low (0-3Hz) or high (22-35Hz) band passed before being combined again with the original carrier signal. The result for each original signal (S) is S_low and S_high, containing only low or high modulation frequencies. Although each of these, when presented separately in intelligibility judgment tasks, has very low (c.a. 20%) intelligibility, the dichotic presentation of S_low with S_high results in very high (c.a. 70%) intelligibility. The current study demonstrates that intelligibility crucially depends on both the slowly varying as well as the rapidly varying components of speech and suggests a binding process, in which a conjunction of these creates an emergent representation that forms the basis for successful speech processing. Furthermore, by introducing a time shift in the onset of S_low relative to S_high we are able to directly investigate the properties of this binding mechanism.