



P1-4

**Resonance characteristics as non-segmental phonological abstractions:  
Some consequences for speech perception.**

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Acoustic resonance patterns associated with liquids in varieties of British English are dependent on the wider phonological systems which obtain in the particular variety: evidence from formant and spectral moment data shows that the relationship between the resonance characteristics of syllable-initial laterals and that of syllable-initial rhotics is dependent on whether the variety contrasts syllable-final liquids. In some non-rhotic varieties, a higher F2 is associated with /l/, while a lower F2 is associated with /r/. In other varieties, the pattern is reversed. The value of F2 is simply associated with difference between the two liquids rather than being an indication of laterality or rhoticity. These characteristics do not apply simply to the local consonantal articulation, but are also found spread across a considerably wider portion of the speech signal. It has been demonstrated that these long-extent effects are important for perception, at least in standard southern British English. If resonance characteristics add to the perceptual coherence of the speech signal, then perceptual models need to be able to incorporate the phonetic dependencies which have been identified over long temporal extents and across different positions in hierarchical phonological structure. If a perceptual model encodes the fact that resonance is used to differentiate liquids but not the direction in which that differentiation obtains, it must be based on a phonology without intrinsic phonetic content. Phonological categories are then purely relational rather than concrete. Such an approach could sit well with exemplar-based or adaptive resonance models of perception which incorporate top-down processing, since phonetic detail is not discarded but rather is used to relate individual tokens of speech to abstract categories. Acoustic resonance characteristics increase robustness in noise and could contribute to reducing the search space. Since some aspects of acoustic resonance are spread over a relatively short extent in the speech signal while others occur over a much larger extent, questions are raised as to the adequacy of the segment/phoneme and even the lexeme as a phonological unit to be accessed in perception. Admitting phonological attributes at non-terminal node levels in the prosodic hierarchy has the consequence that perceptual models need to look to variable-domain phonology, perhaps with short-term memory interacting with activations associated with short-extent phonetics to produce virtual long-extent windows within which acoustic resonance characteristics could be detected.