

## **Spatial cues are used differently for localizing and identifying the same attended auditory object.**

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Spatial cues are not only important for localization of auditory objects. They have also been identified to contribute to formation of perceptual objects or streams across frequency and time. In previous experiments, it has been shown that spatial cues influence the grouping of an ambiguous target tone with competing temporal and spectral grouping cues, and thereby altering the identification of the across-time (rhythmic) and across-frequency (vowel) objects (Lee *et al*, 2005). Here we investigate whether localization of these across-time and across-frequency objects with similar spatial and spectro-temporal contents can be predicted by the grouping results of the identification experiments.

The stimuli were repetitions of a three-tone sequence, consisting of a pair of pure tones followed by a harmonic complex, similar to that used in the aforementioned identification experiments. The harmonic complex was spectrally shaped by a synthetic vowel formant, producing the percept of a repeating vowel that occurred at a rate one-third that of a separate, ongoing stream of pure tones. The vowel was generated such that its perceived identity depended on whether or not one particular harmonic (the “target”) was perceived in the complex. The perceived rhythm of the ongoing tone was also dependent on whether the target was grouped in the across-time object. However, unlike in previous identification experiments, subjects were not asked to report the identity of the across-time or across-frequency percepts. Instead, in this experiment, subjects were asked to use an acoustic “pointer”, manipulated by varying the interaural level difference of a 200-Hz narrowband noise, to match the intracranial position of either the attended across-time or across-frequency object.

Results show that the localization of the attended object can be influenced by the spatial cue of the target regardless of whether the target is grouped in the same attended object in the identification task, despite having the same spatial and spectro-temporal contents. In some conditions, the target was not perceived in the object identification task, but yet the spatial cue of the target influences the localization of the same object. This suggests that spatial cues are used differently for identifying and localizing auditory objects.

[Supported by ONR N00014-04-1-0131 and Bogue Fellowship, UCL.]