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Mechanisms of contextual plasticity in sound localization

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Contextual plasticity (CP) is a form of short-term adaptation in sound localization, operating on time scales of tens of seconds to minutes. At least two different mechanisms have been proposed to underlie this effect: 1) adaptation in auditory spatial representation that reflects a change in the stimulus range caused by the context (as the context typically included a distractor presented from a new location outside the range of the experimental targets), and 2) precedence buildup-like mechanism activated by the context (because the context typically consisted of distractor-target click pairs presented on majority of trials and interleaved with target-alone experimental trials). Here a new experiment was performed and previous experimental data were analyzed with the goal of determining which of the two mechanisms is more likely to cause CP. The experiments manipulated the following aspects of the context: 1) whether the distractor and target were presented as pairs, 2) the distribution of distractor and target locations, and 3) the order of distractor and target. Results are partially consistent with the adaptation mechanism. But in some conditions, the shifts predicted by the adaptation mechanism were not observed, suggesting that the precedence buildup or other mechanisms are also active. [Supported by APVV-0452-12.]