Mechanisms of contextual plasticity in localization of click sounds with a preceding distractor

Lubos Hladek[1,2], Beata Tomoriova[2], Norbert Kopco[1]
[1]Institute of Computer Science
[2]Center of Applied Informatics
Faculty of Science
P. J. Safarik University, Kosice, Slovakia
Jesenna 5, Kosice, Slovakia

When two brief sounds are heard in a sequence, the first arriving sound from the fixed *apriori* known location affects the bias and increases localization variance of the later arriving sound [Kopco et al., JASA, 121, 420-432, 2007; Tomoriova et al.; ARO Abstract #655, 2012]. The effect was observed for stimulus onset asynchronies 25 ms – 400 ms, but in interleaved control trials without preceding sound an unexpected contextual bias with increasing temporal profile has been observed. In current investigation we seek for the underlying neural mechanisms of this contextual plasticity. The examined candidate mechanisms are precedence or precedence build-up like mechanisms, adaptation, auditory streaming, relative vs. absolute localization strategy, or change in perceptual organization. In two experiments temporal properties of the stimuli, frequency of inducing trials, streaming parameters, and distractor-target similarity were manipulated. The results show that contextual bias is present only in Target-only click trials interleaved with Distractor-Target click pairs, but not in runs without D-T click pairs. The magnitude of the effect is about 4 degrees. The effect grows with the frequency of D-T click pairs, but only moderately with change in temporal asynchrony in D-T click pairs. If the distractor was replaced by a stream of clicks, contextual plasticity increased. On the contrary, a one-second noise burst distractor decreased contextual plasticity. Localization variance was affected mostly in trials with D-T click pairs at the shortest SOA, but some of it persisted even to contextual trials with Target-only stimuli. Current results support previous findings and extend the knowledge of adaptive and integrative mechanisms of auditory processing.

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