Approaching sounds dilate the perceived time

Literature reports numerous examples of the effect of moving *visual* stimuli on time estimation. Here we investigated the effect of auditory stimuli. Auditory stimuli were rendered by using the vOICe, a sensory substitution software converting visual images into the equivalent auditory ‘images’. We rendered: the sound of an approaching object, the sound of an object moving away from the listener, and a ‘scrambled’ version of the previous two stimuli (baseline condition). These auditory stimuli were repeatedly played to blindfolded participants and represented the ‘background’ of the task; the ‘main task’ consisted of estimating the duration of target sounds. Target sounds were 300 Hz pure noise sounds, thus clearly distinguishable from the background. We found that, when participants were listening to the sound of approaching objects, they overestimated the duration of the target sounds. In other words, the sound of approaching objects dilated the perceived time. This bias can be interpreted as an evolutionary advantage, because overestimating time reduces the perceived distance between the listener and an approaching object, thus prompting faster behavioural responses.

Time estimation

Audition

Looming

Sensory substitution