

The type of reflections affects speech intelligibility in spatialized noise conditions

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ABSTRACT

Sound reflections can be energetically integrated to some extent in the direct sound thus enhancing speech perception via an apparently improved signal-to-noise ratio; the mechanism is modulated, besides temporal delay, also by the direction of arrival and the phase congruency of the reflections with the direct sound. In real rooms reflections have physical characteristics that mostly depend on the flat or scattering nature of the boundaries they are originated from. So, the nature of the reflections adds a source of modulation in the process of integration which has been not investigated until recently. Early reflections are especially sensitive, because their type can be established by room analysis, and because their integration is more likely due to a shorter time delay. In this paper experiments will be presented where the monaural acoustical indexes are fixed while the type of reflections are changed from specular to diffuse. Speech intelligibility and spatial release from masking are investigated. In particular, firstly only three early reflections are considered and then the all of the reflections in the impulse response are changed. Results differ in the two cases but cross-correlation criteria are appropriate to demonstrate the binaural effects on both target source and masker.

Keywords (3-6): Scattering, Perception, Speech intelligibility, Spatial release of Masking