Olivocochlear reflex strength and the auditory attentional filter

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When a clearly audible tone (a cue) is presented in background noise, detection of a subsequent near-threshold probe tone of the same frequency as the cue is greater than detection of a probe tone of a different frequency (Greenberg & Larkin, 1968; Tan *et al.*, 2008). This effect has been reported to be absent in patients who have undergone a vestibular neurectomy, (Scharf *et al.*, 1997) implicating the efferent olivocochlear system in the generation of this so-called "attentional filter". Such a role is consistent with physiological data that show a release from masking caused by activation of the olivocochlear pathway (Mulders *et al.*, 2008). We investigated the involvement of the olivocochlear system in the attentional filter in 15 normal hearing human subjects. Strength of the crossed olivocochlear reflex was assessed using contralateral noise suppression of otoacoustic emissions and this was correlated with features of the attentional filter in the same subjects. There was a significant tendency for subjects with a stronger olivocochlear reflex to detect non-cue tones better than those with a weak olivocochlear reflex. Detection of cued tones did not correlate significantly with olivocochlear reflex strength. The results provide evidence for a frequency-specific anti-masking role for the olivocochlear system, but do not support a simple correlation between the strength of the attentional filter and the background strength of the olivocochlear reflex, under the task conditions employed in this study.

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