A novel multitalker word detection paradigm to assess neural correlates of conscious auditory perception

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Abstract

Studies of the neural correlates of conscious perception often rely on threshold-level stimuli, allowing identical inputs to be perceived or not across trials. However, weak stimulation reduces neural response magnitude and statistical power. We developed a novel paradigm manipulating conscious perception using supra-threshold stimuli. Participants heard concurrent speakers producing pseudo-words with jittered onsets. In some trials, a real word was embedded. Conscious access was manipulated by varying word intensity: absent, equal to pseudo-words (target condition), or higher. In an active task, participants reported the word and rated its audibility. In a passive task, participants heard identical stimuli but detected tones while ignoring the words. Behaviourally, participants failed to detect words on 1/3 of active target trials, yielding unconscious trials. Audibility ratings revealed an all-or-none pattern. By contrasting EEG activity across conscious and unconscious trials and between active and passive tasks, this study isolates neural activity specific to conscious perception.

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