

Sleep-mediated Learning of Distorted Speech

Sleep has been studied as an important factor in the process of perceptual learning, a type of learning that improves our ability to make meaning from sensory input, such as interpreting noise-vocoded (distorted) speech. This type of audio signal is similar to the constructed sound of cochlear implants, surgically implanted hearing prostheses for individuals with significant hearing loss. Previous research has shown CI users vary in terms of speech recognition outcomes, indicating potential differentiations in how acoustic degradation is learned. Memory consolidation is the aspect of sleep that's relevant to perceptual learning, by incorporating learned information into long term memory. This study focused on the influence of the time of day training takes place, and subsequent test performance outcomes on noise-vocoded speech transcription. Participants were assigned to a sleep ($n = 7$) or wake ($n = 7$) group and completed remote training and testing on noise-vocoded speech across a 1-week period. Throughout this week, participants undergo an initial training and subsequent tests measuring their performance transcribing a noise-vocoded audio. We hypothesize that listeners trained within two hours of sleep onset will see increased accuracy in the auditory transcriptions initially, due to sleep consolidation occurring directly after training; conversely, we expect that participants trained within two hours of waking up would miss this benefit of consolidation, but would neutralize any performance deficits during later tests after their own period of sleep.