PEER-REVIEWED RESEARCH

FEBRUARY 2026

Signia IX enhances the brain's response to speech and reduces listening effort in noisy group conversations

Two peer-reviewed studies[1,2] have shown how Signia Integrated Xperience (IX) with RealTime Conversation Enhancement (RTCE) positively impacts brain activity in wearers listening to a group conversation taking place in loud complex background noise.

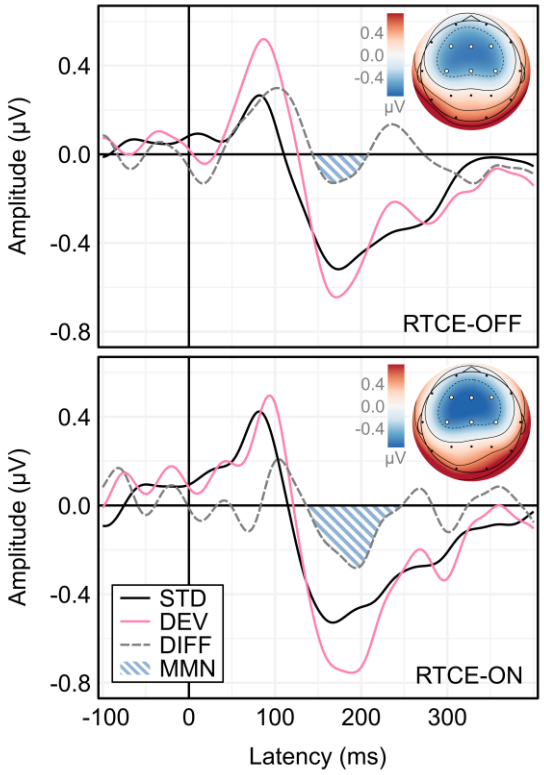
As summarized in a new white paper[3], both studies measured the participants' electroencephalogram (EEG) to investigate the effect in the brain of activating RTCE in a simulated group conversation in noise.

In one study, it was shown that the average mismatch negativity (MMN), which is a measure of **the brain's response to changing speech sounds**, shown as the hatched area in the first figure, was **80% higher with activation of RTCE**. This finding indicates a significant improvement in phoneme discrimination, which is one of the most important prerequisites for speech understanding.

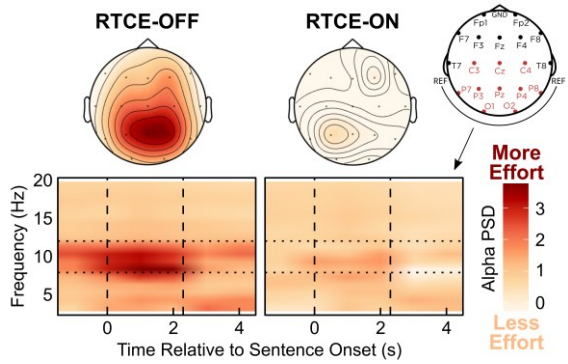
In the other study, the average alpha-band power spectral density (PSD), which provides a measure of the exerted **listening effort**, was **significantly reduced by 50% when RTCE was activated**. This is illustrated by a much lighter shading in the topographic plot shown in the second figure, and it suggests a substantial reduction in the wearer's listening effort.

A major advantage of EEG measurements is that they offer objective insights into the effects of hearing aid amplification on listening-related brain activity. In conclusion, the two studies showed **clear objective benefits of RealTime Conversation Enhancement on EEG measures related to speech understanding and listening effort in a noisy group conversation.**

Improved phoneme discrimination (MMN):



Lower listening effort (alpha-band power):



1. Slugocki, C., Kuk, F., & Korhonen, P. (2024). Using the Mismatch Negativity to Evaluate Hearing Aid Directional Enhancement Based on Multistream Architecture. Ear and Hearing, 46(3), 747-757.
2. Slugocki, C., Kuk, F., & Korhonen, P. (2024). Using Alpha-Band Power to Evaluate Hearing Aid Directionality Based on Multistream Architecture. American Journal of Audiology, 33(4), 1164-1175.
3. Slugocki, C., Kuk, F., & Korhonen, P. (2026). Signia IX enhances the brain's response to speech sounds in noise and reduces neural signatures of listening effort. Signia White Paper.

Unleash the power of conversation

The two EEG-based studies provide objective evidence of how Signia IX with RTCE supports brain activity in a noisy group conversation. The studies showed that RTCE was associated with an 80% enhancement in how strongly wearers' brains automatically reacted to changing speech sounds and a 50% reduction in neural activity linked to listening effort.

Signia IX supports wearers in keeping up with the conversation no matter how busy it gets, empowering them to participate and contribute with ease, and to unleash the power of conversation!

Read the white paper here:

signia