

Opn™ outperforms traditional and narrow directionality

Speech understanding in noisy environments is a common frustration for people with hearing loss, especially in multi-talker situations. Directional technology, one approach to this challenge, preferentially amplifies speech from in front of the listener while suppressing all other sounds. Further narrowing the focus of the directional “beam” can offer additional benefit, but only for speech directly in front of the listener. Oticon defied conventional thinking about directionality and noise reduction to create an innovative approach for handling multiple speakers in a noisy environment – the open sound experience. Opn enhances speech of everyone in the conversation and gives the listener access to the 360° soundscape.

Putting Opn to the test

Independent researchers tested 25 subjects in a scenario that mimics a real-life conversation among four friends in a noisy restaurant.¹ Each participant wore Oticon Opn 1 miniRITE with OpenSound Navigator™ set to the strongest noise reduction setting. The results obtained with Opn were compared against solutions from two other major manufacturers’ (Brand 1 and Brand 2) which use traditional directionality and narrow directionality/beamforming, respectively.

Opn vs. Two Directionality Technologies



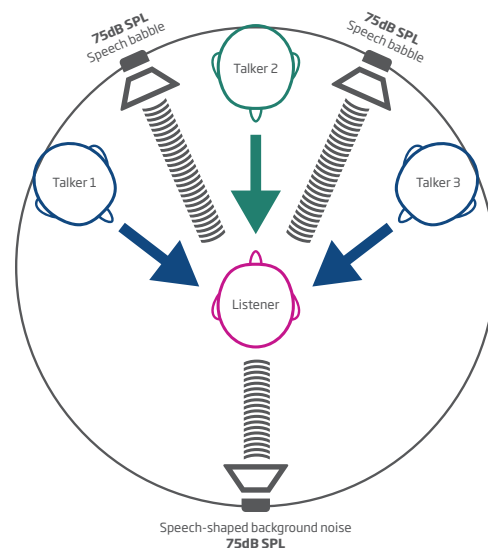
Breakthrough technology - breakthrough research design

Usually, speech understanding is tested with a single speaker positioned right in front of the listener with noise presented from behind. However, this artificial test situation doesn’t accurately represent the challenges of a real-life conversation. Researchers selected a more difficult speech-in-noise task² to simulate the noisy, challenging restaurant scenario.

Noise sources: Fixed intensity 75dB SPL speech babble presented from both sides ($\pm 30^\circ$) and speech-shaped background noise from behind the listener (180°).

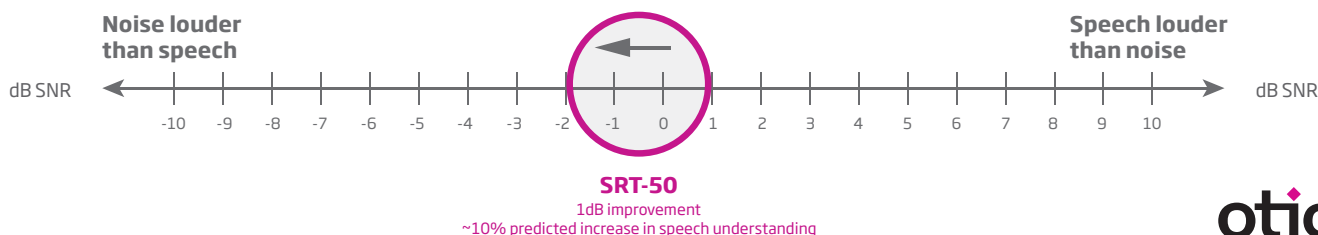
Random order speech signals: Varying intensity, presented from the front (0°) and both sides ($\pm 60^\circ$) of the listener

Speech Reception Threshold (SRT)-50: the lowest signal-to-noise ratio (SNR) at which the listener can correctly identify 50% of sentence-based key words, representing the limits of successful participation in the conversation.



Comparing results across technologies

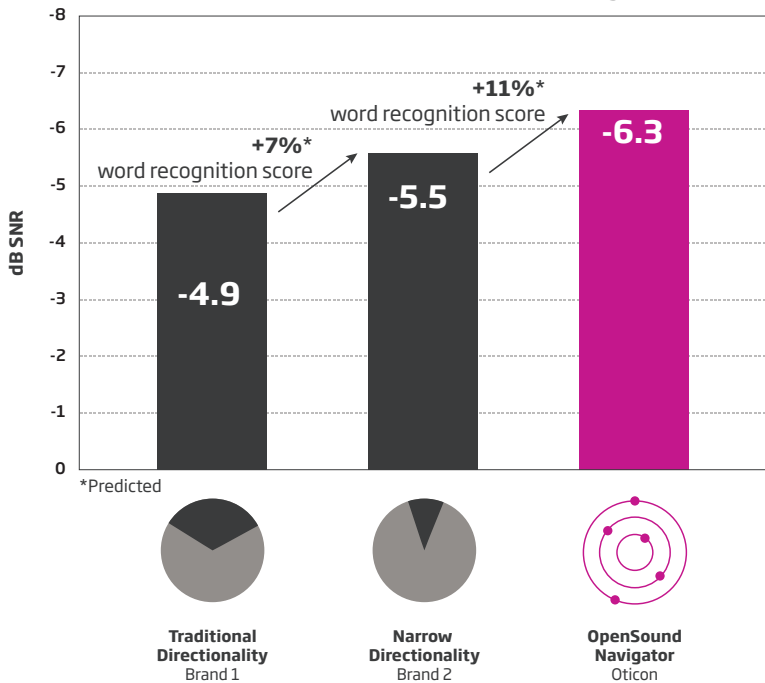
Performance for each subject was compared across all three hearing aid fittings. The lower, more negative the SRT-50, the better the predicted ability to function in noise. It is generally assumed that a 1dB decrease in SRT-50, corresponds to a 10% improvement in speech understanding.³



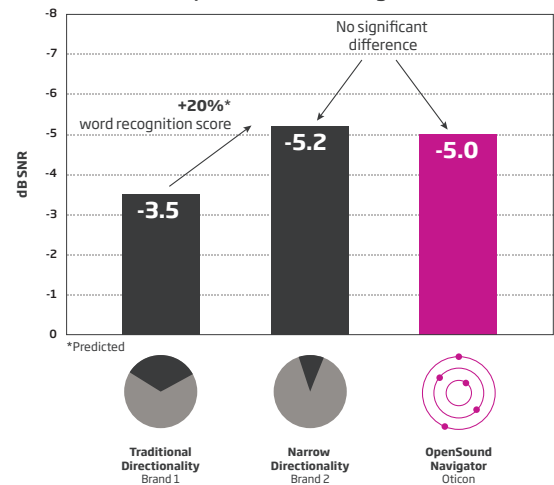
Opn™ outperforms **traditional and narrow directionality** and provides best access to all participants in a conversation

This study demonstrates that Oticon's OpenSound Navigator provides overall improvement in word recognition in noise when compared to directional and narrow directionality/beamforming systems.

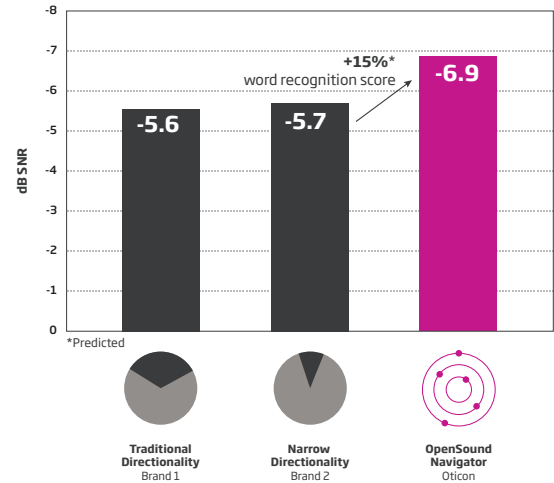
Overall Improvement in Speech Understanding



Best-in-class speech understanding from the center



Best-in-class speech understanding from the sides



Overall results: Combined results from all signal sources and averaged across subjects yielded an SRT-50 of -6.3dB for Opn, which is significantly better than Brand 1 and Brand 2 directional technologies. This correlates to a predicted improvement in speech understanding of 11% vs. Brand 2 and of 18% vs. Brand 1.

Speech understanding from the center: Opn and Brand 2 performed equally well, both outperforming Brand 1. This correlates to an anticipated 20% improvement in word recognition compared to traditional directionality.

Speech understanding from the sides: Opn outperformed both directional technologies with an SRT 50 of -6.9dB and a predicted improvement in speech understanding of 15%.

References

- ¹Beck DL, LeGoff N. Speech-in-noise test results for Oticon Opn. Hearing Review. 2017; 24(9):26-30.
- ²Hörtech. Oldenburg Sentence Test (OLSA). Oldenburg, Germany: Hörtech. Available at: <http://www.hoertech.de/en/medical-devices/olsa.html>
- ³Taylor B, Mueller HG. Fitting and Dispensing Hearing Aids. 2nd ed. San Diego: Plural Publishing; 2017.



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