

Dataset for: "Investigating the effects of age and hearing loss on speech intelligibility and amplitude modulation frequency selectivity"

This dataset supports the findings outlined in Regev, J., Zaar, J., Relaño-Iborra, H., and Dau, T. (2025). "Investigating the effects of age and hearing loss on speech intelligibility and amplitude modulation frequency selectivity." The Journal of the Acoustical Society of America, 157(3), 2077-2090. <https://doi.org/10.1121/10.0036220>

This file describes the contents of the dataset.

The dataset contains data for 10 young and 9 older listeners with normal hearing (young and older NH listeners), as well as 9 older listeners with hearing impairment (older HI listeners).

The data collected were:

- Population data: age, tested ear, and reverse digit span score
- Audiograms
- Speech-reception thresholds (SRTs)
- Average dynamic ranges of masked-threshold patterns (MTPs)
- TP numbers across datasets (providing the corresponding TP numbers for the present dataset and those of Regev *et al.*, 2024a and Regev *et al.*, 2024b).

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Population Data

Dataset giving the population information for the 28 participants (*tp*), split into young NH, older NH, and older HI (*group*), tested in the study. The data summarizes the participants' *age*, tested ear (*ear*), and their Reverse Digit Span score (*rds_score*). The age is given in years and the reverse digit span score is given on a normalized scale from 0 to 1.

The reverse digit span scores are re-used from Regev *et al.* (2024a; 2024b).

Audiogram

Audiometric thresholds (*thresh*) were collected for 28 participants (*tp*), split into young NH, older NH, and older HI (*group*), at frequencies (*freq*) of 0.125, 0.25, 0.5, 1, 2, 3, 4, 6, and 8 kHz. The thresholds are given in dB Hearing Level (HL).

Speech-Reception Thresholds (SRTs)

Speech-reception thresholds (*SRT*) at the 50%-correct point were collected for 28 participants (*tp*), split into young NH, older NH, and older HI (*group*). The SRTs are given in dB signal-to-noise ratio (SNR). The test used the Danish Hearing in Noise Test (HINT; Nielsen & Dau, 2011).

Five different maskers (*conditions*) were used:

1. a speech-shaped noise (*SSN*)
2. the ICRA-5 noise (*ICRA*; Dreschler *et al.*, 2001)
3. a male competing talker (*Male comp*)
4. a female competing talker (*Female comp*)
5. a cocktail-party scenario (*Cocktail*).

A detailed description of each masker is available in the article. For each condition, the SRT was assessed twice (*repetition*), each time using a different list (*list*) from the target speech corpus. The SRTs were then averaged across repetitions.

Dynamic Range of Masked-Threshold Patterns (MTPs)

Regev *et al.* (2024a; 2024b) collected masked-threshold patterns (MTPs) for the 28 participants (*tp*), split into young NH, older NH, and older HI (*group*). MTPs were collected at four different target modulation frequencies (*fmod*) of 4, 16, 64, and 128 Hz.

Here, the average dynamic range (*dyn_range*) of the MTP at the 4-Hz target modulation frequency (*fmod*) was derived for each participant. For each participant, the peak of the MTP was identified as the maximum threshold. The difference between the peak and the minimum threshold on each side of the peak was then computed, and the average dynamic range was finally calculated as the mean between the differences on both sides. If a single side of the peak was identified, then the threshold difference on that side was taken as the dynamic range.

Masked thresholds for TP23 could not be obtained for the 4-Hz target modulation frequency by Regev *et al.* (2024b; where the participant was labeled TP07). Hence, the dynamic range was registered as *NaN*.

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TP numbers across datasets

The participant in this study previously provided data reported in the datasets by Regev *et al.* (2024a, 2024b). Some of these data were re-used in this study, either directly (i.e., the RDS scores) or to derive new measures (i.e., the MTPs to derive the dynamic ranges). This sheet provides the correspondence of the TP numbers between this dataset (*tp*) and those of Regev *et al.* (2024a, 2024b; *tp_Regev_2024a* and *tp_Regev_2024b*, respectively), for each listener group (*group*). The sheet states *NA* in case the participant was not included in the previous dataset.

Ethical statement

All listeners were financially compensated for their time and gave written informed consent. Ethical approval for the study was provided by the Science-Ethics Committee for the Capital Region of Denmark (reference H-16036391).

References

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<https://doi.org/10.11583/DTU.25134611>

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Corresponding article:

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