

Supplementary Material

MEG reveals atypical sensitivity to linguistic sound sequences in Autism Spectrum Disorder

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Left hemisphere time-courses

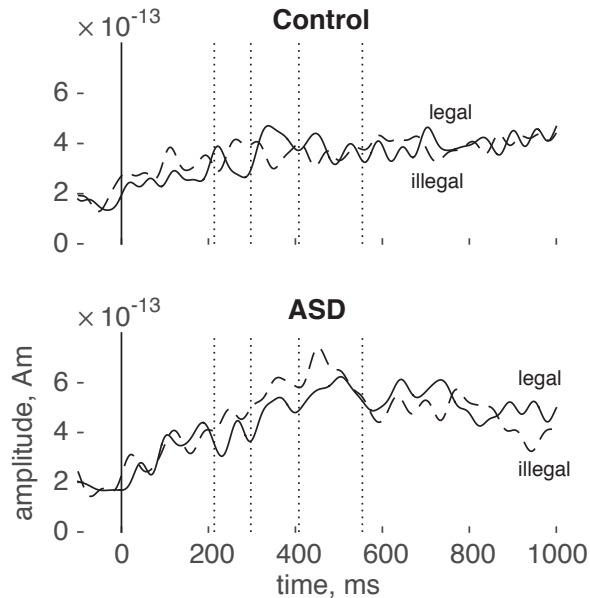


Figure S1 Left auditory source waveforms for control participants (top), and children with Autism Spectrum Disorder (ASD, bottom).

Exploratory analysis of event-related changes in spectral power

The hypothesis-driven evoked analysis was complemented by an exploratory analysis of event-related changes in spectral power. To our knowledge, no previous work has probed the spectro-temporal effects elicited by unexpected phonological sequences.

Epochs were defined from -1 to 2 s around target stimulus onsets. Trial rejections and ICA weights from the main analysis were applied to these epochs to remove artifacts. Source time-courses from left and right primary auditory cortex, projected along the axis of most variance, were estimated using LCMV beamforming. Time-varying changes in spectral power for each source were estimated using Morlet wavelets from 2 to 50 Hz over 20 ms intervals (wavelet width ranged in linear increments from 3 to 10 cycles). Spectro-temporal power was converted to percentage-change relative to a baseline of -300 to -100 ms before stimulus onset. As in the main analysis, statistical effects from left

and right auditory cortex were tested with a non-parametric cluster-based permutation test with 10,000 simulations in an interval spanning 297 – 1000 ms and 2 – 50 Hz.

Time-frequency results are shown in Supplementary Figure S2. In the right auditory source, there was a significant effect for group such that power increased, relative to baseline, between 3 and 6 Hz more-so for participants with ASD than for control participants in a time-window from 300 ms to the end of the epoch at 1000 ms. This interval is outlined in Figure S4. There was no effect for phonotactic legality ($p = 0.217$), nor was there a significant interaction between phonotactics and group ($p = 0.470$). There were no significant effects in the left auditory source.

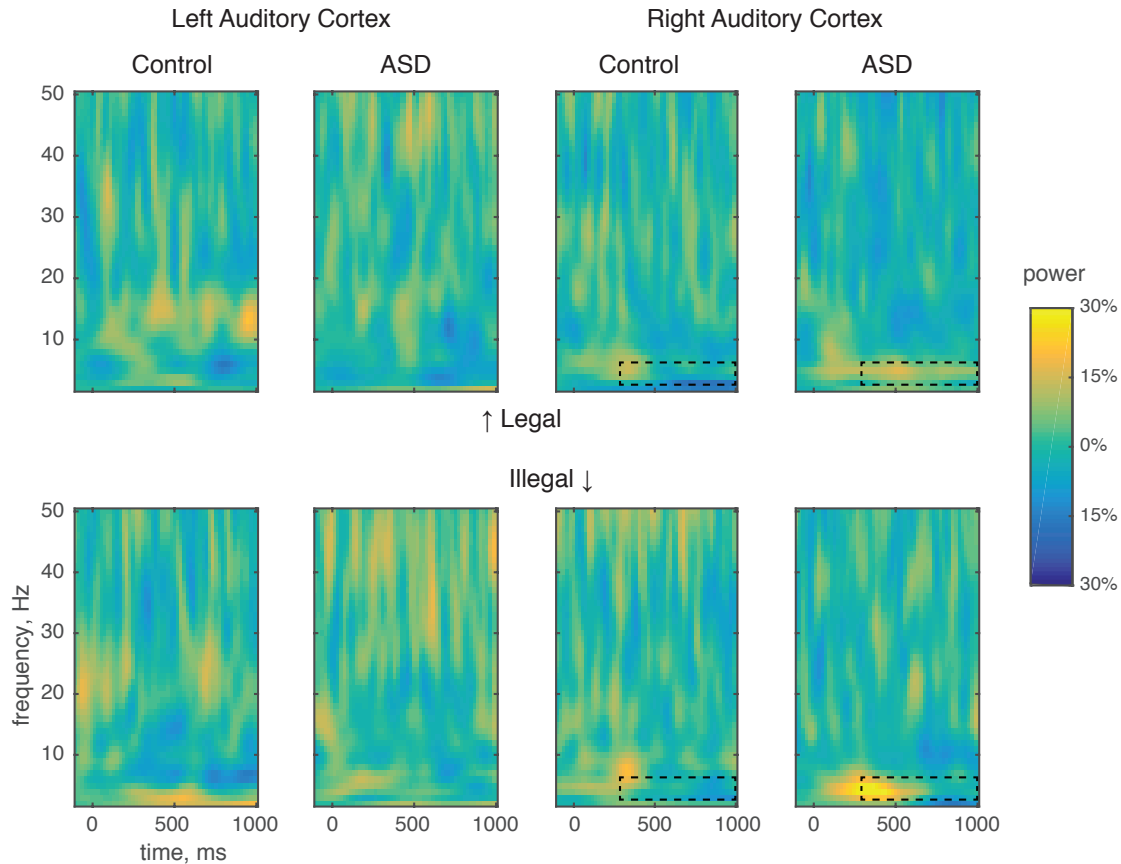


Figure S2 Event-related changes in power, relative to baseline, from left and right auditory cortex sources in control participants and participants with ASD for phonotactically legal (top row) and illegal (bottom row) stimuli. Signals are time-locked to stimulus onset. Dashed boxes indicate an interval from 300 to 1000 ms, spanning 3 to 6 Hz, in which there was a main effect for group in the right auditory cortex.

Works Not Cited

Due to space limitations, several relevant studies could not be cited in the main text.

On auditory processing and language comprehension, including phonology, in ASD:

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On methodology:

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