

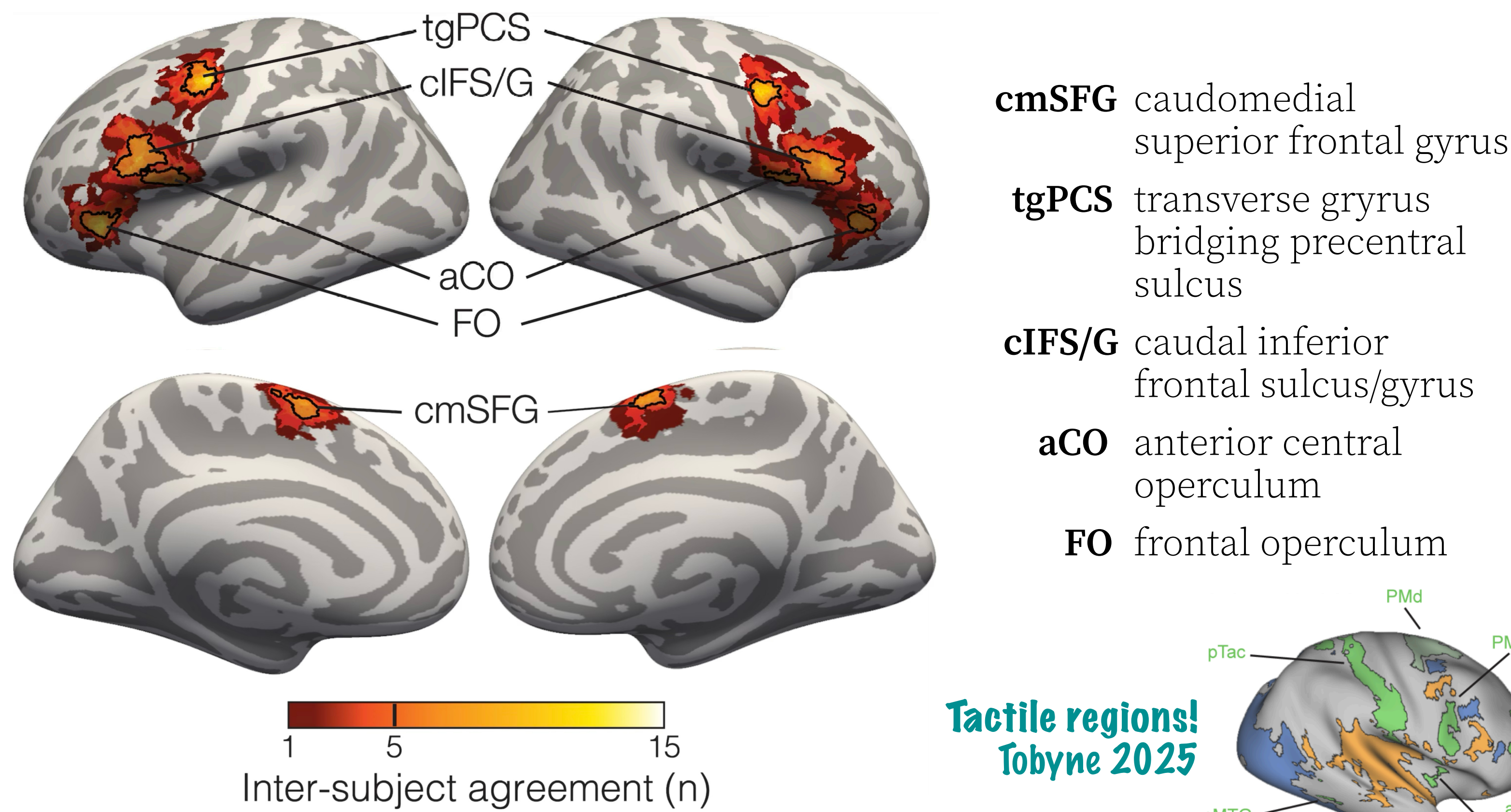
Functional specializations for auditory cognition in human prefrontal cortex

Abigail Noyce, Wusheng Liang, Madhumitha Manjunath, Christopher Brown, Sahil Luthra, Barbara Shinn-Cunningham

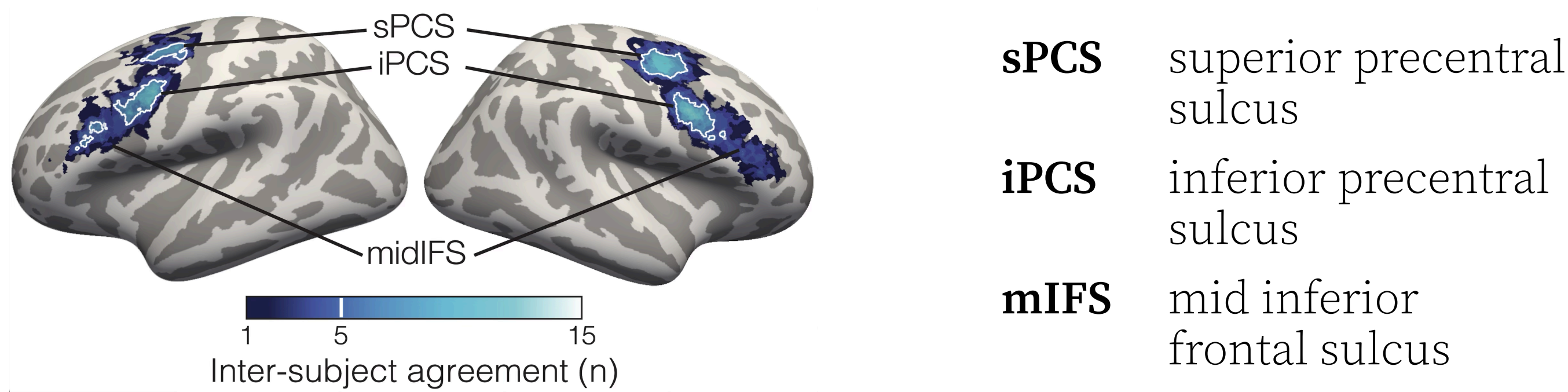
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Auditory-biased PFC



Visual-biased PFC



Prefrontal cortex contains discrete areas preferring **auditory** or **visual** cognition.

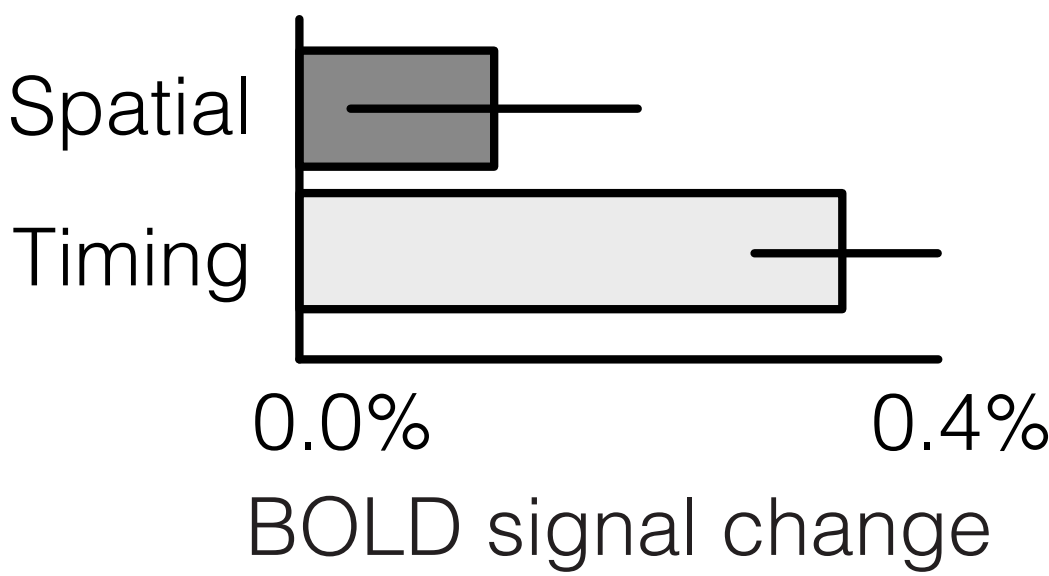
Localized in individual subjects.

2-back **working memory** for animal sounds vs. face photos (Noyce 2017, 2022).

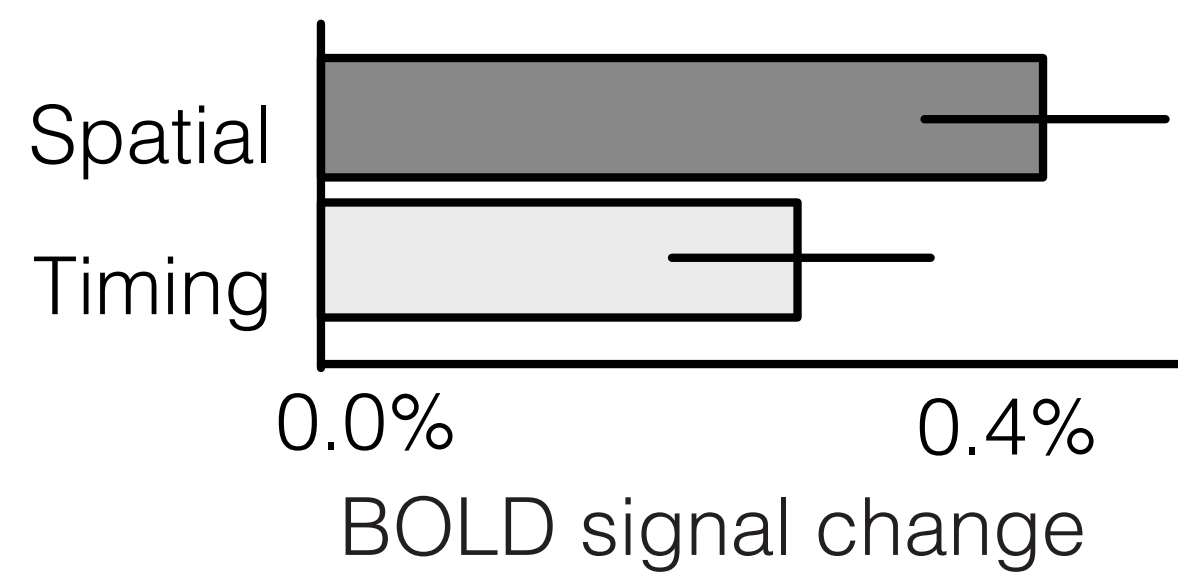
Selective attention to visual vs. auditory stream (Michalka 2015).

Replicates within & across people (Noyce 2017).

Auditory PFC in Visual Memory



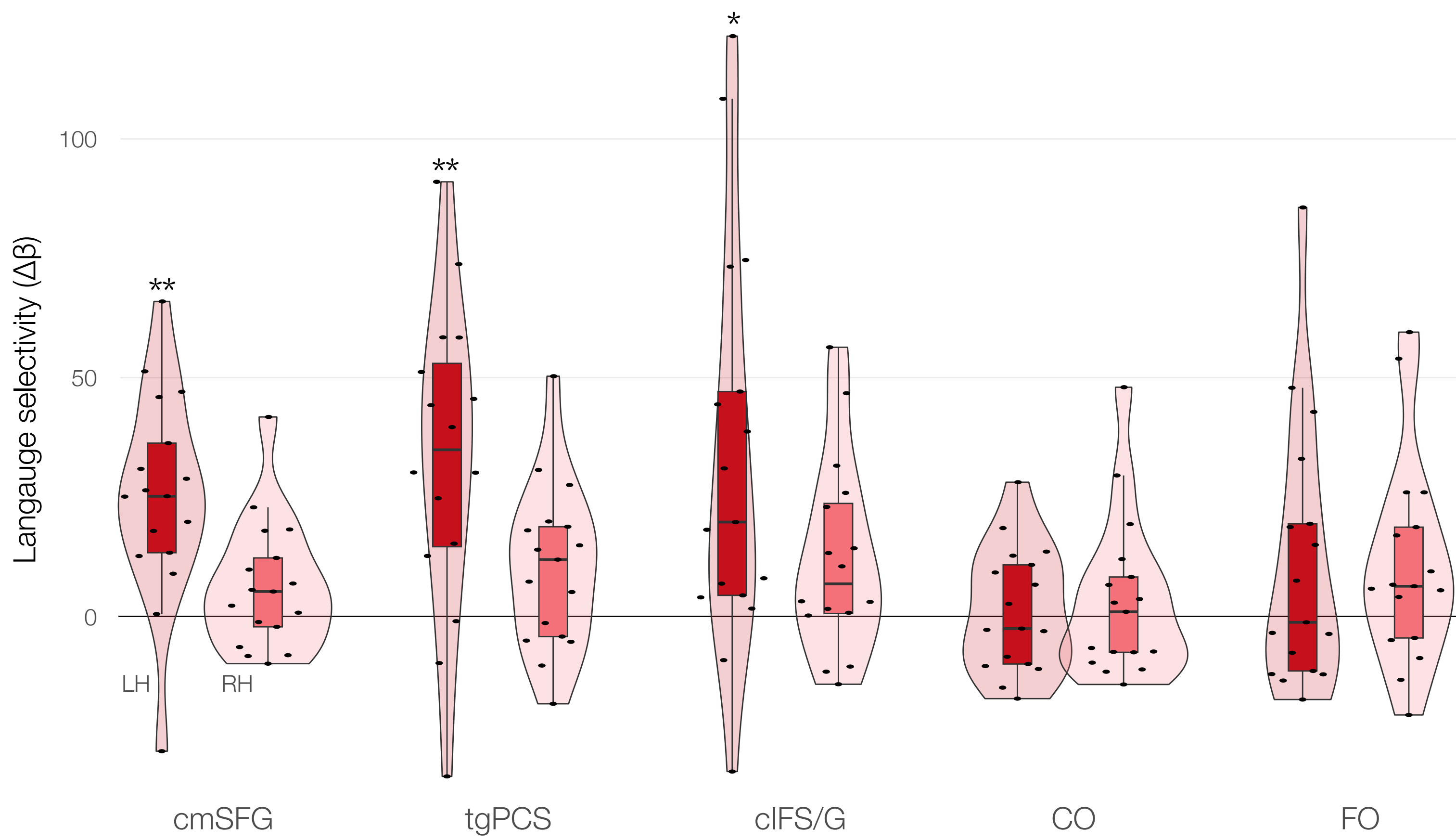
Visual PFC in Auditory Memory



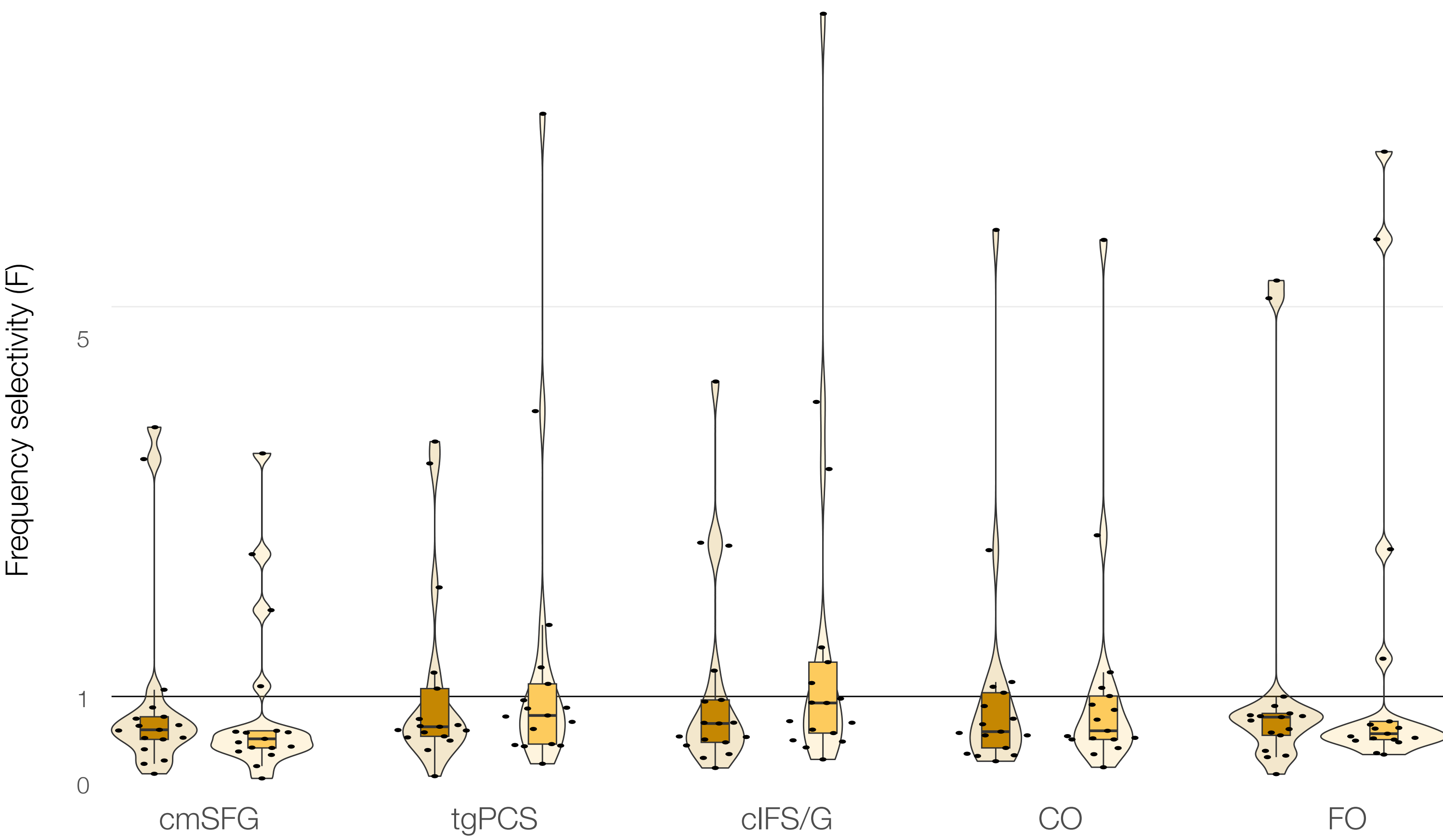
Sensory networks are **specialized for relevant computations** (Michalka 2015, Fleming 2024).

Is there other **specialization** within **auditory-biased PFC**?

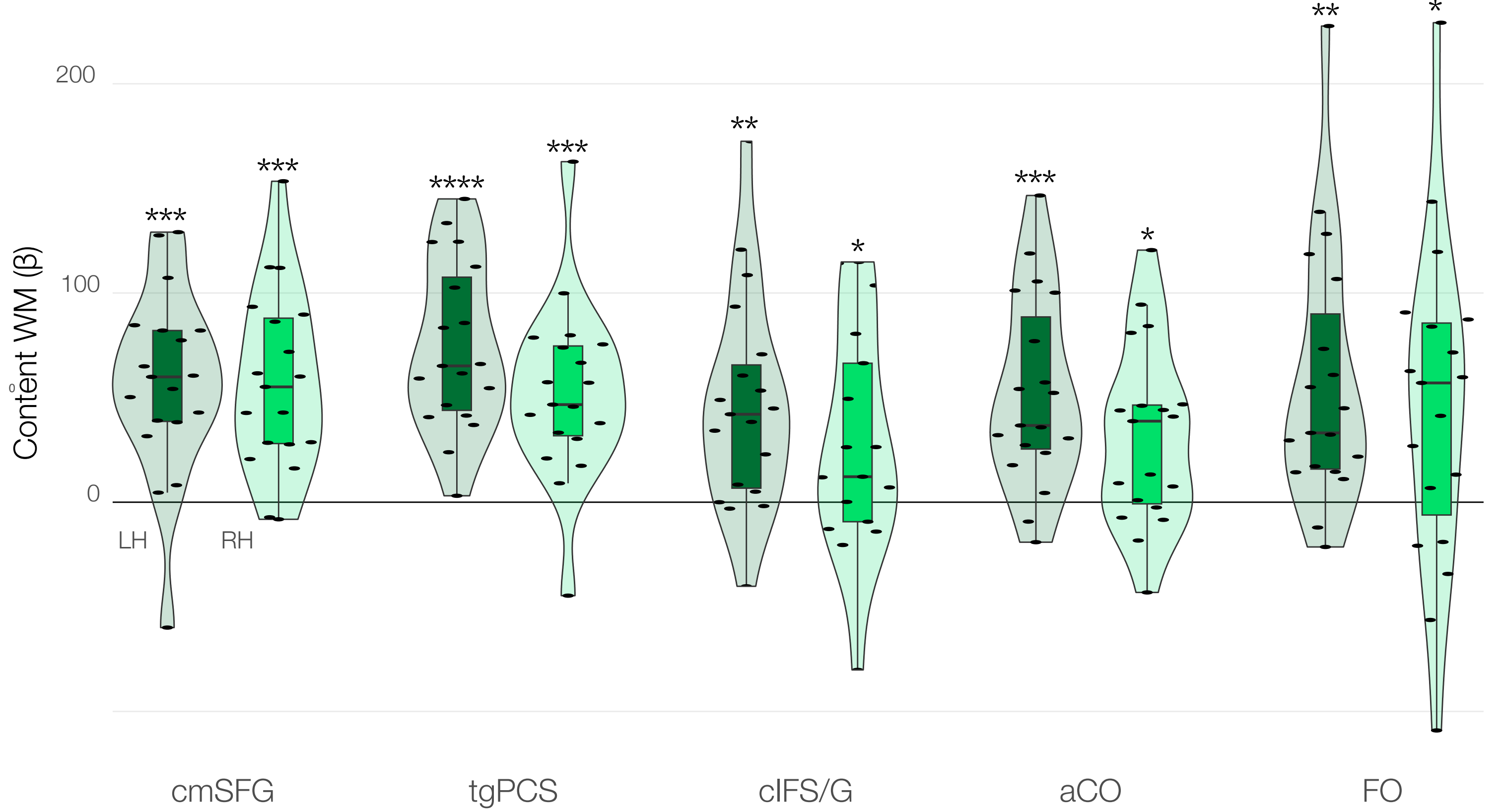
Language selectivity. Sentence reading (vs. matched non-words, Scott 2017) recruits dorsal regions in LH.



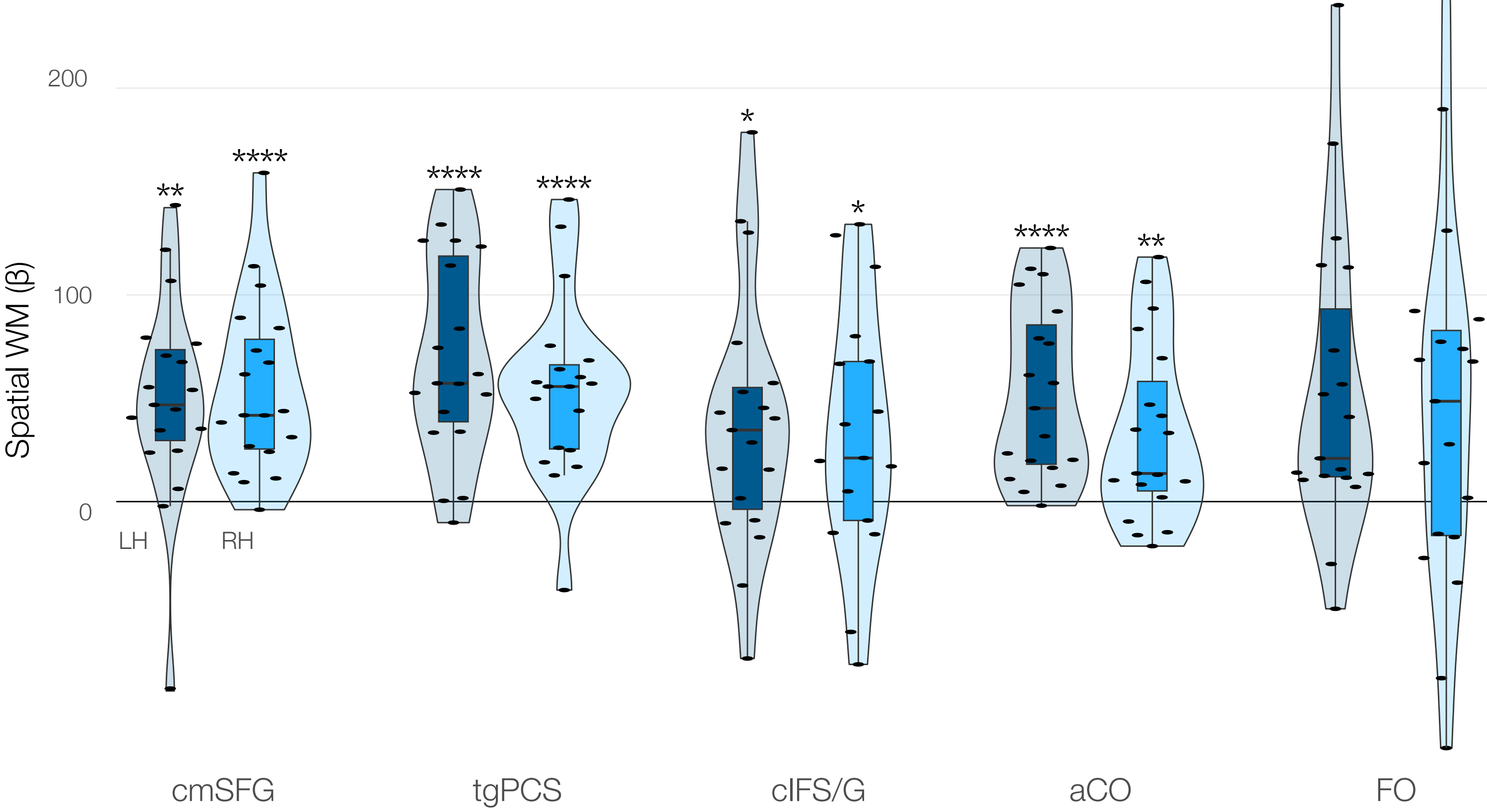
Tonotopy. No regions demonstrate preferred pitch (2-back embedded in frequency sweeps, Dick 2017).



Content working memory. WM for non-speech "crash" stimuli is slightly left-biased.



Spatial working memory. WM for auditory location recruits all 10 auditory-biased PFC regions.



Few, if any, differences across auditory-biased PFC in these tasks. Question remains open: **Why have (at least) five different regions?**