MAPPING HUMAN CORTEX

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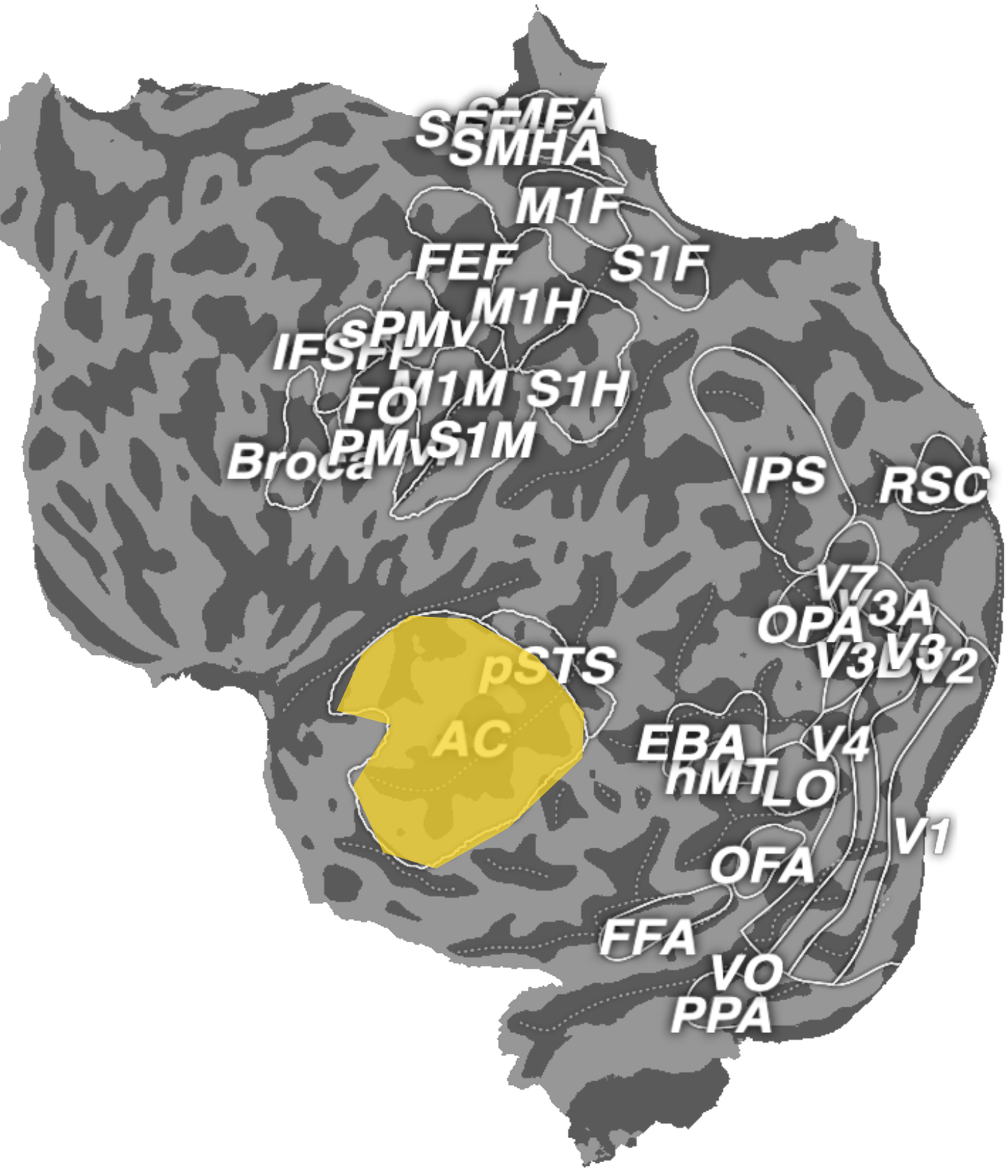
10.29.2020

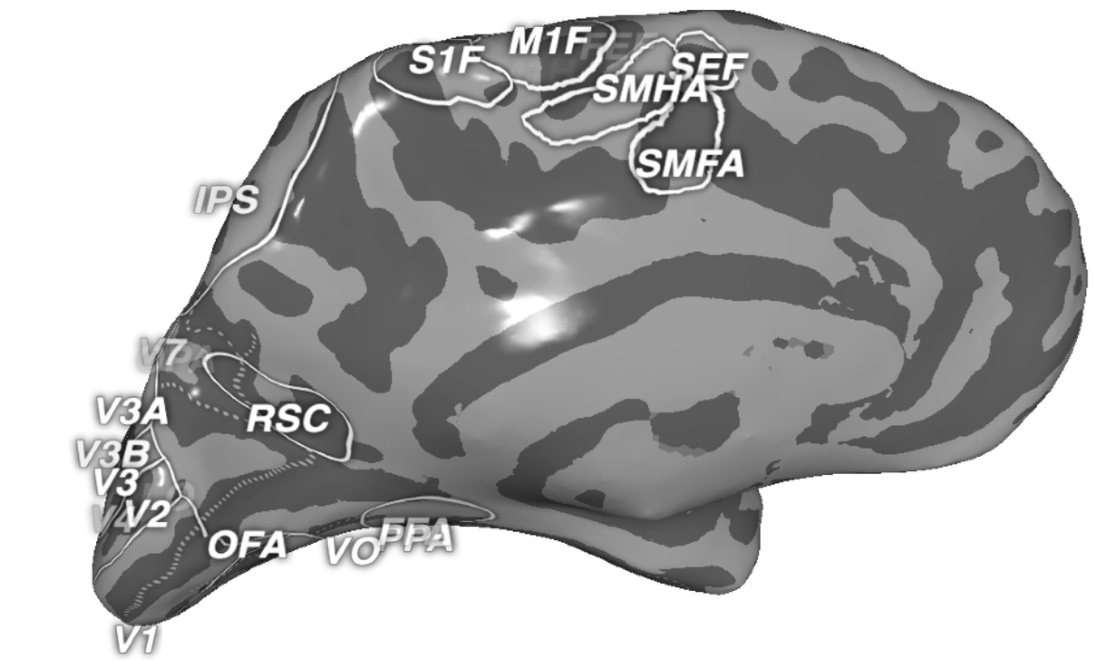
HOMEWORKS

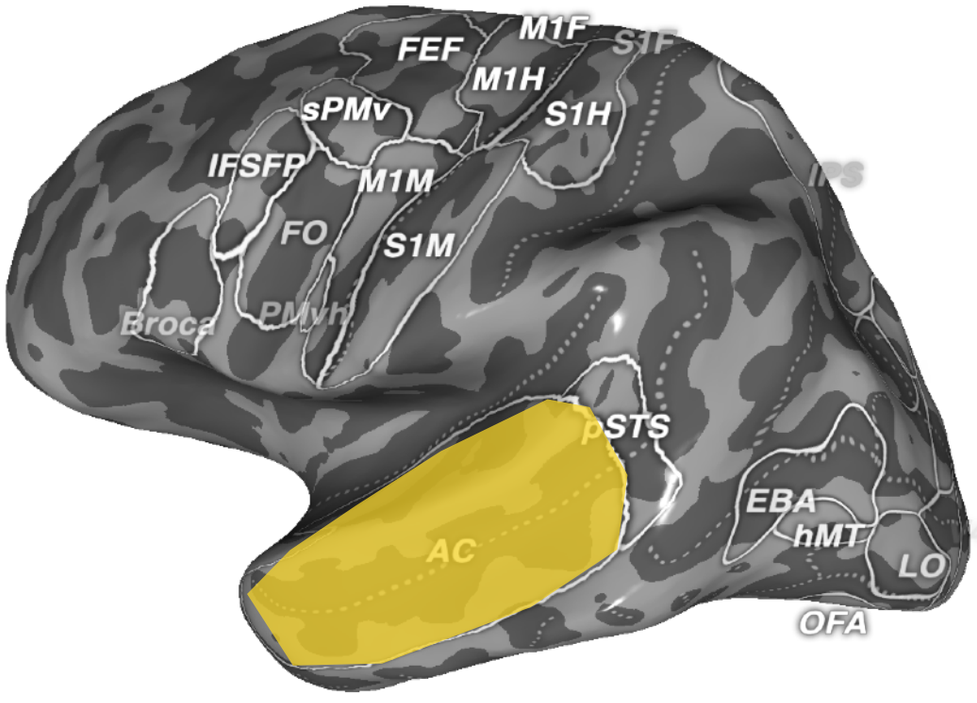
* **Homework 2** (visual ctx.) was due TODAY!

* **Homework 3** (covering the somato-motor systems) will be posted before next class

AUDITORY CORTEX



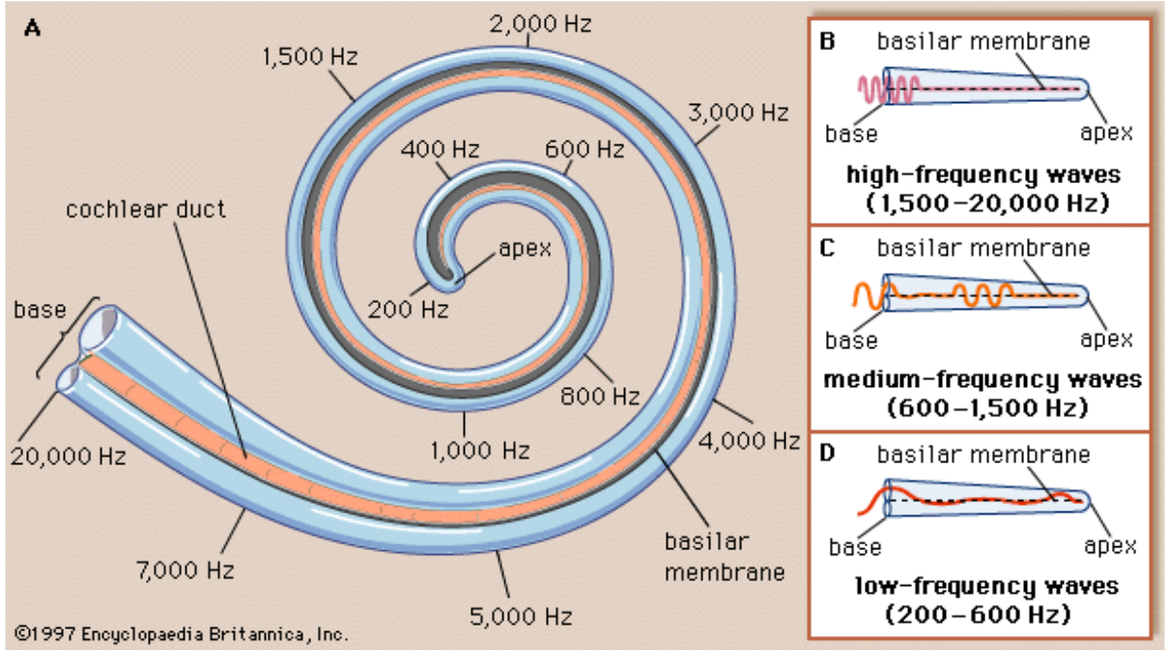




TONOTOPY

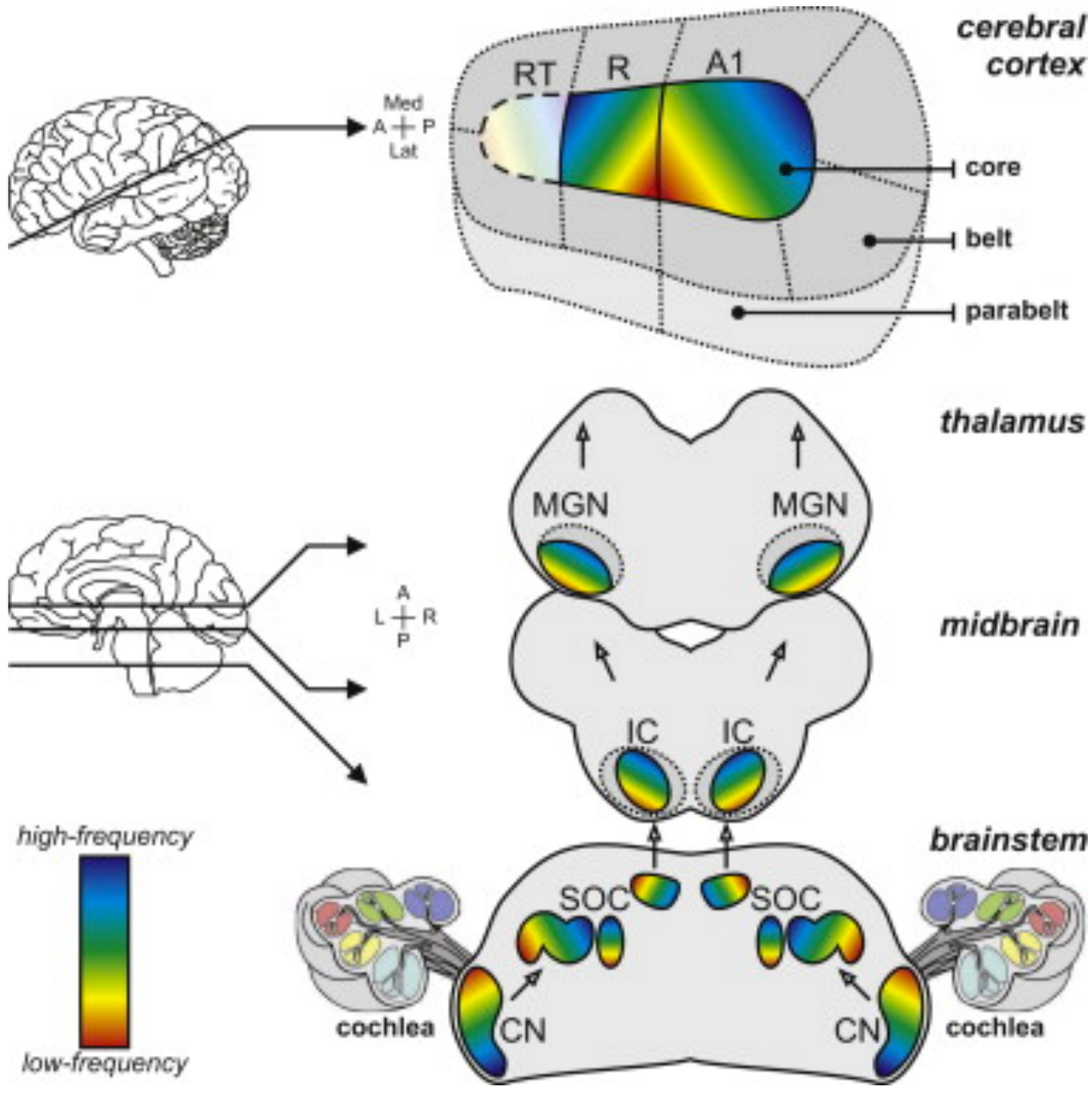
* In auditory cortex we have **tonotopy**: different neurons respond selectively to different frequencies of sound

* This follows from the *cochlea*, our hearing organ



TONOTOPY

* **Tonotopy**
  appears at *every level* of the auditory system (not just cochlea and cortex)



AUDITORY SUBDIVISIONS

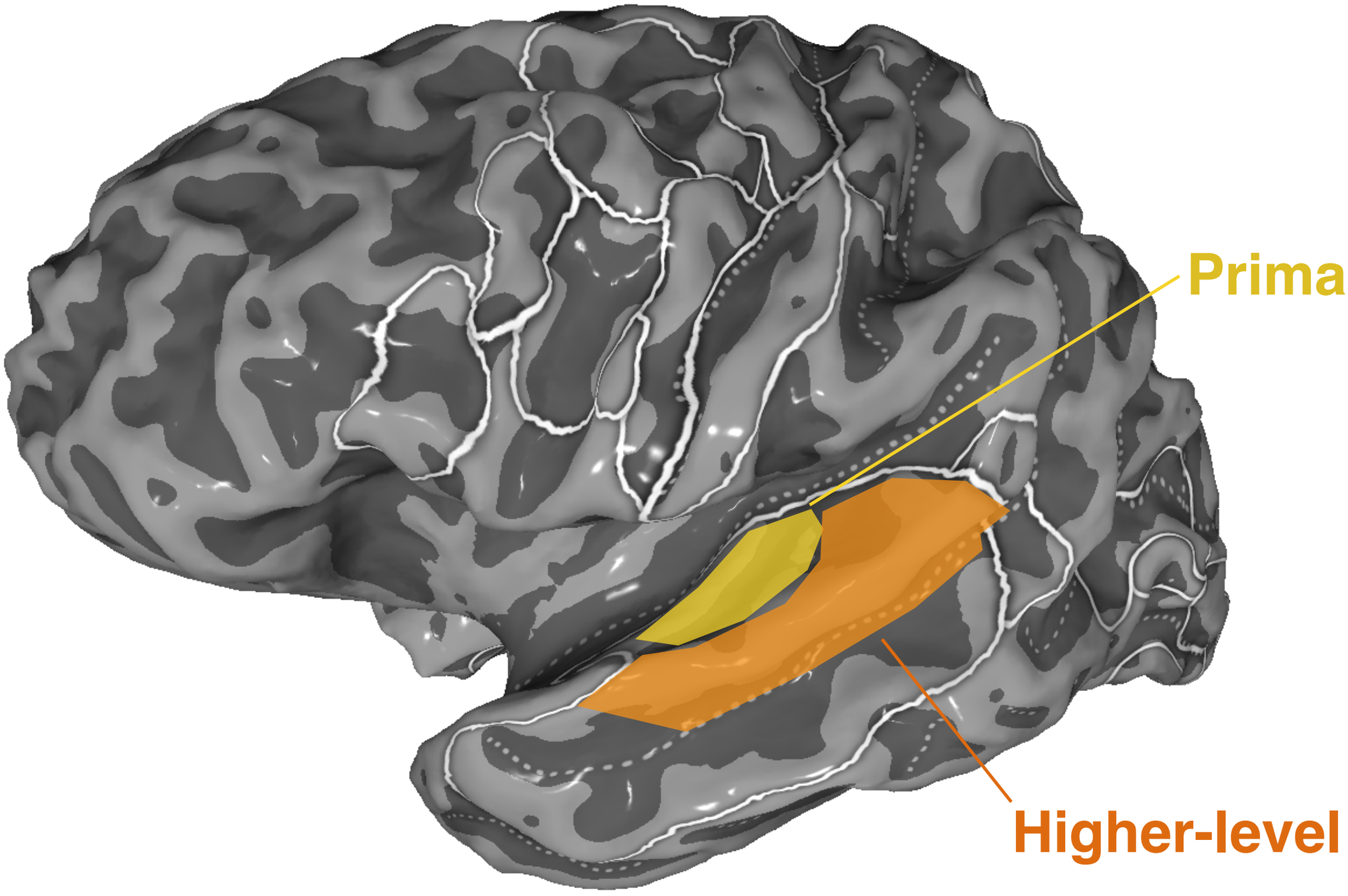
* Unlike others we've talked about, the auditory system in humans is **not** very well mapped

* Still, there is general agreement that:

  * **Primary auditory cortex** (A1+R+RT) on Heschl's gyrus is the first stage of cortical processing

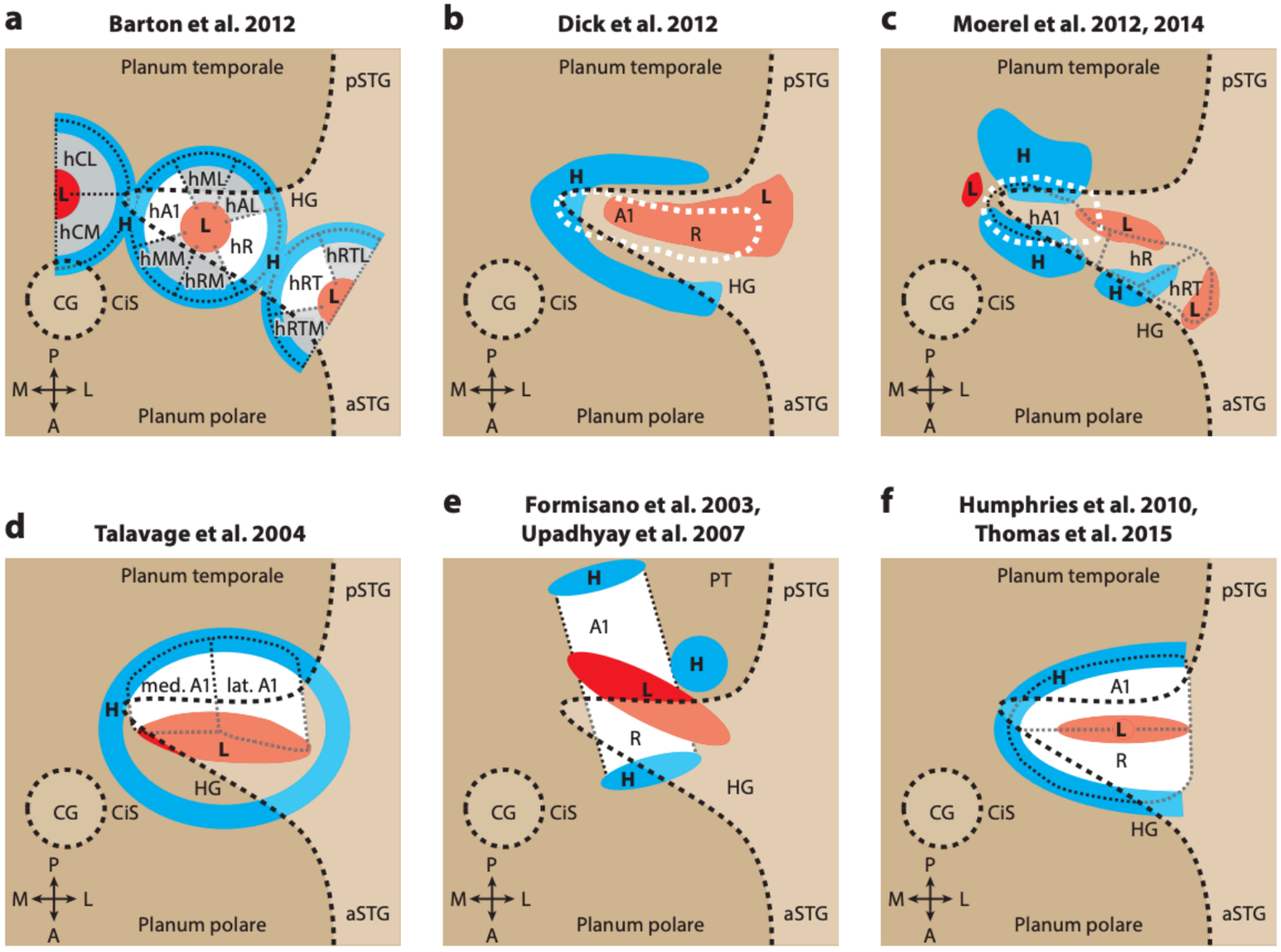
  * **Higher auditory cortex** in STG, STS contains later stages of processing

AUDITORY SUBDIVISIONS



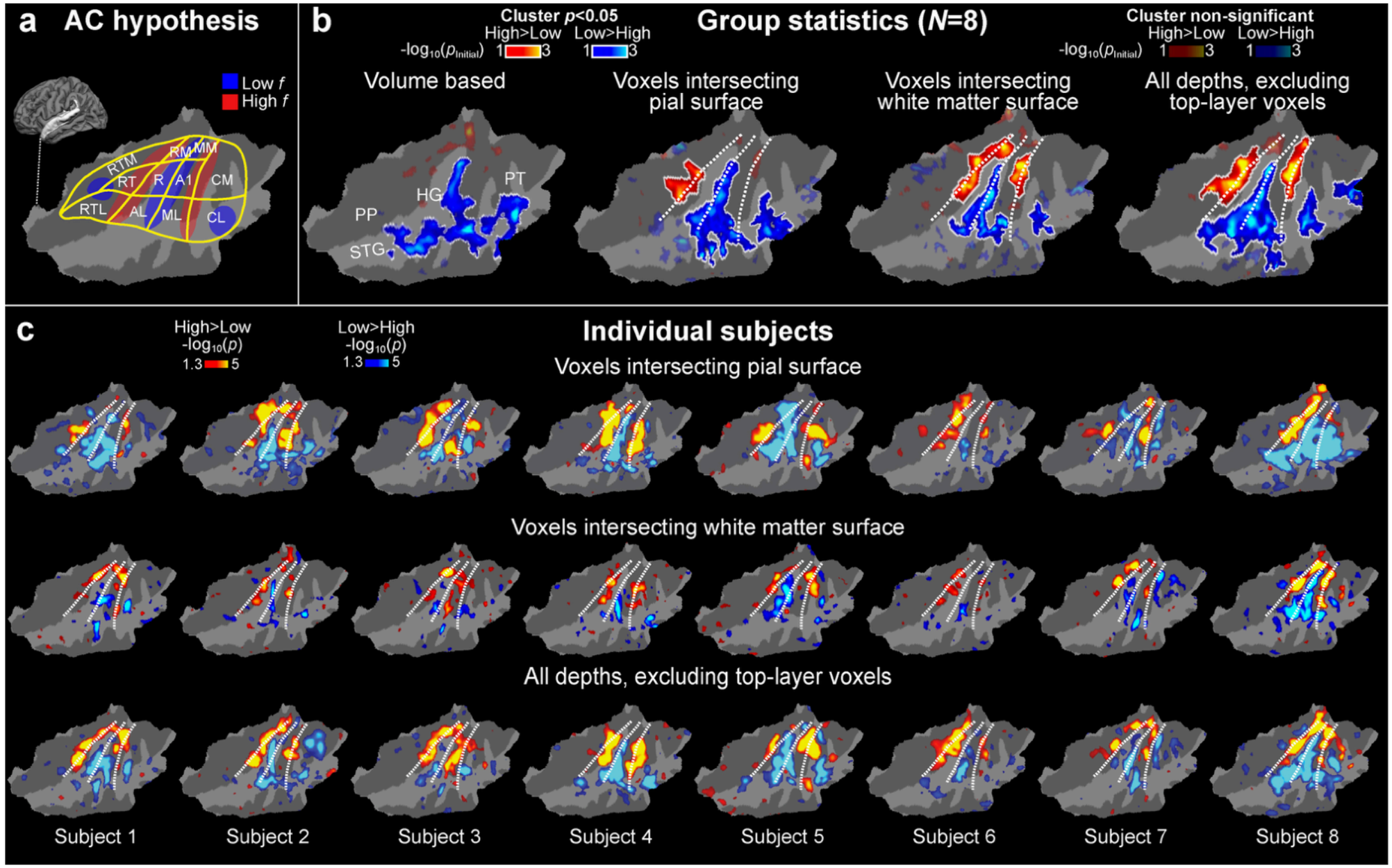
TONOTOPIC MAPS

* How many? Where? Very unclear!



Brewer & Barton (2016)

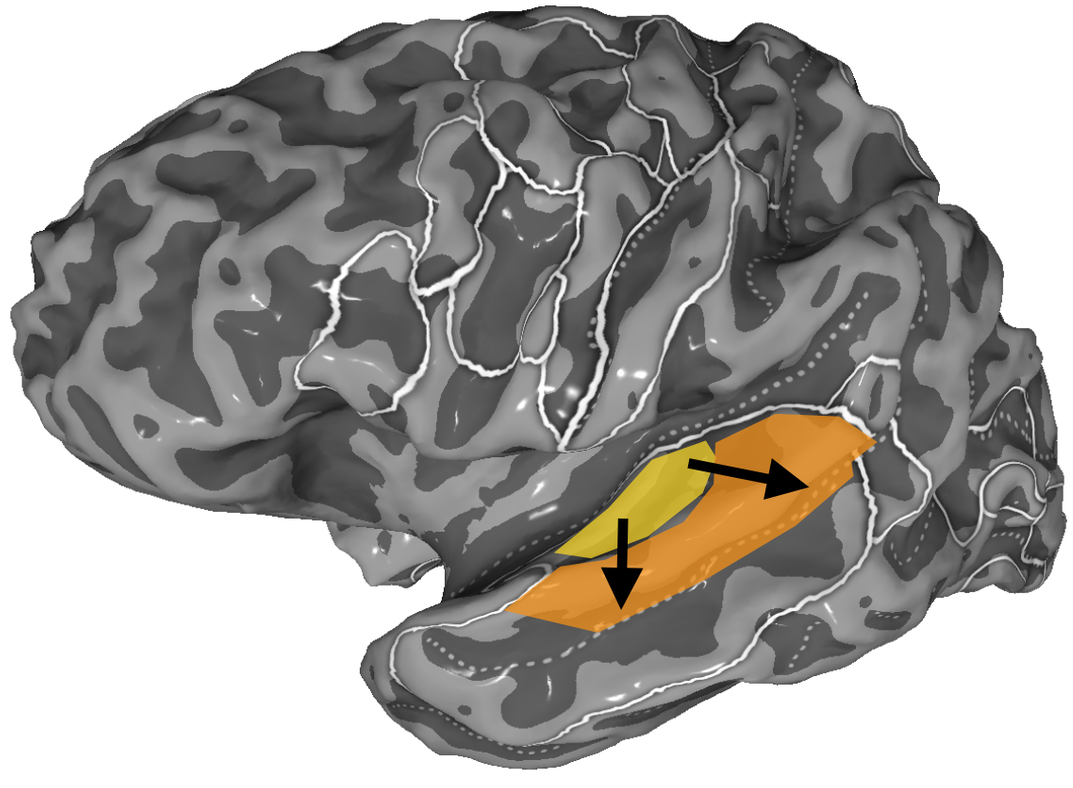
TONOTOPIC MAPS



Ahveninen et al. (2016)

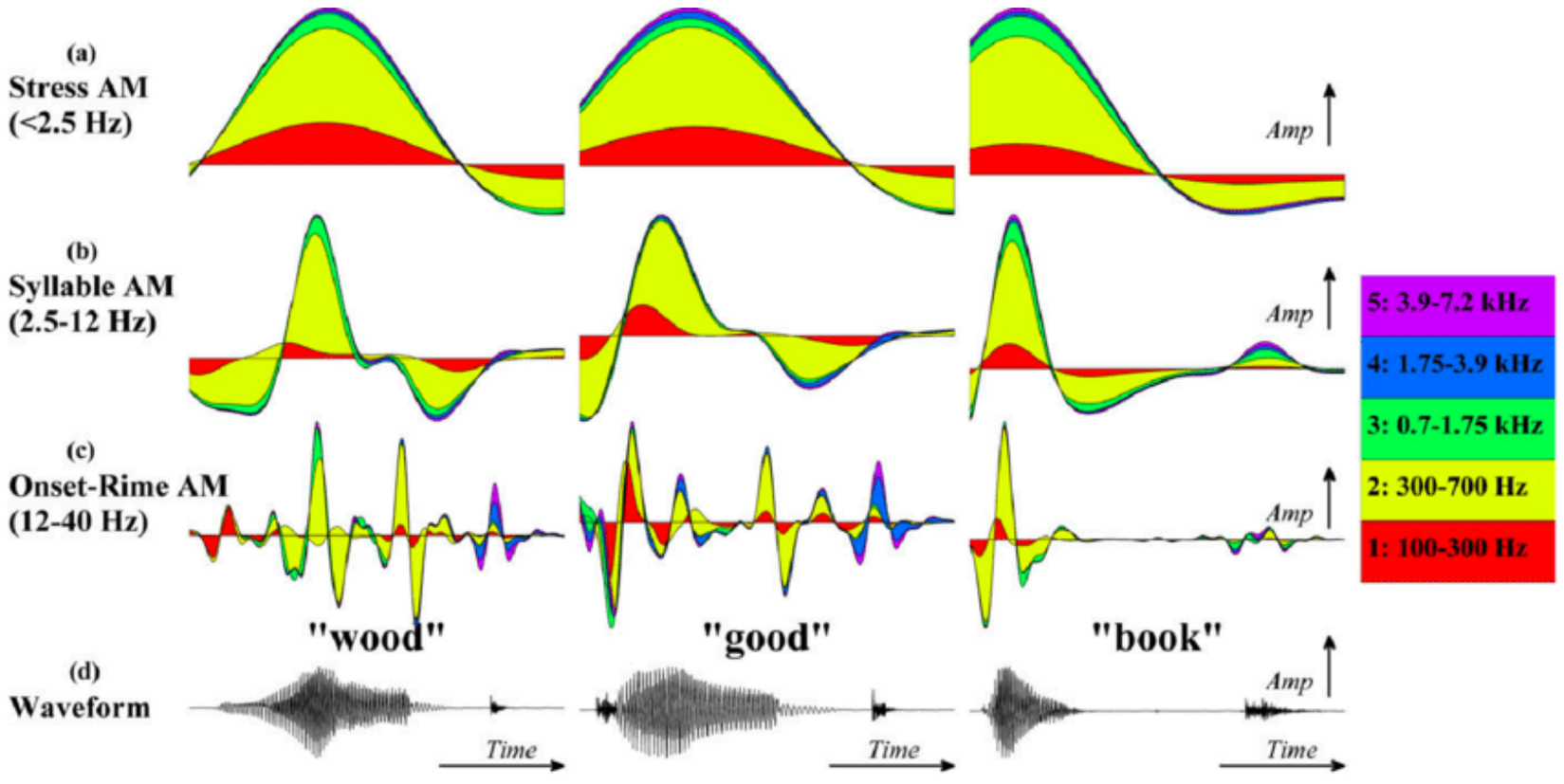
AUDITORY SUBDIVISIONS

* One thing people agree on is that there is a **complexity gradient**: representations get more complex and selective (for specific types of sounds) from PAC to higher auditory cortex



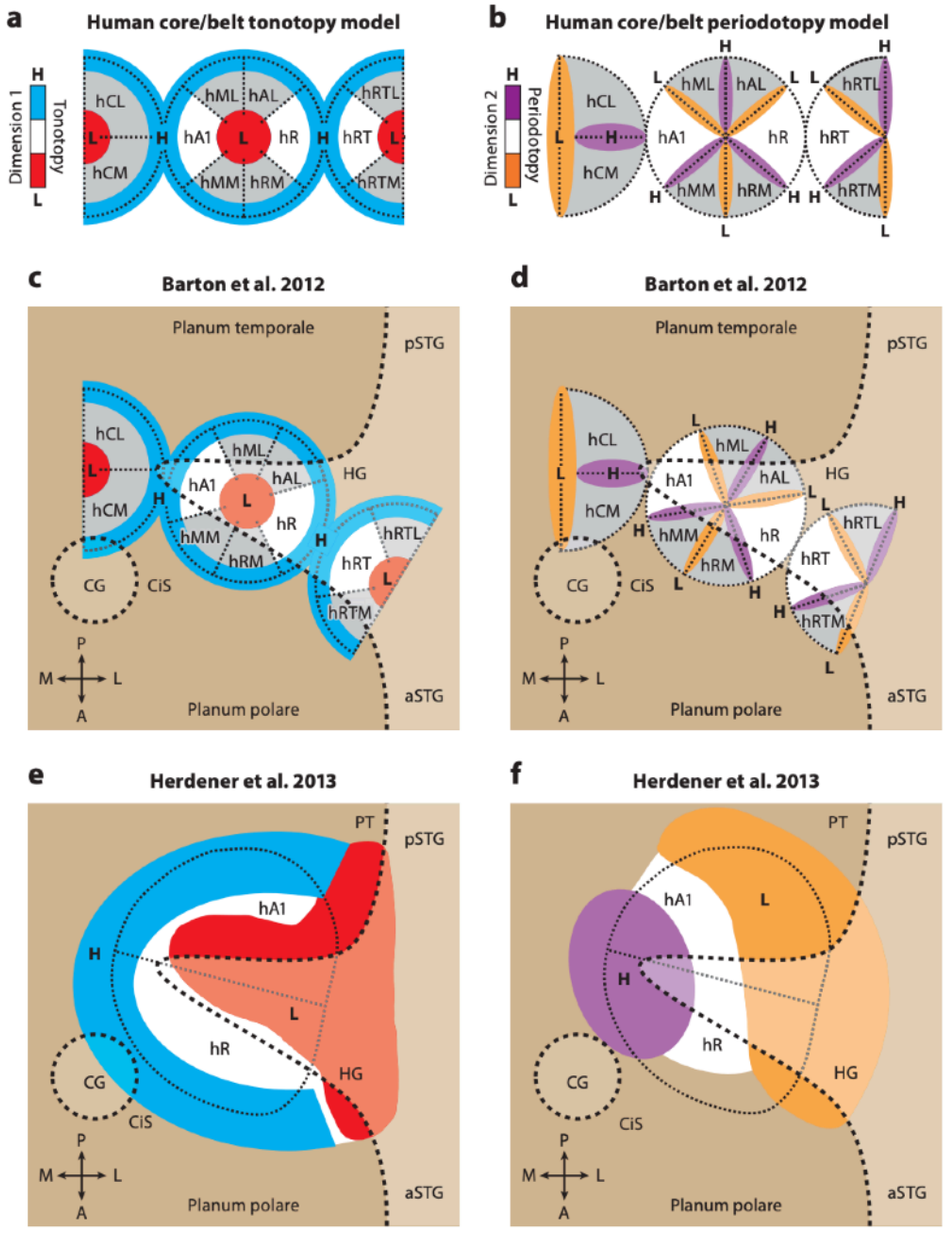
OTHER FEATURES?

* **Temporal modulation**, or how quickly the sound signal is changing over time, is another feature thought to be important in auditory cortex



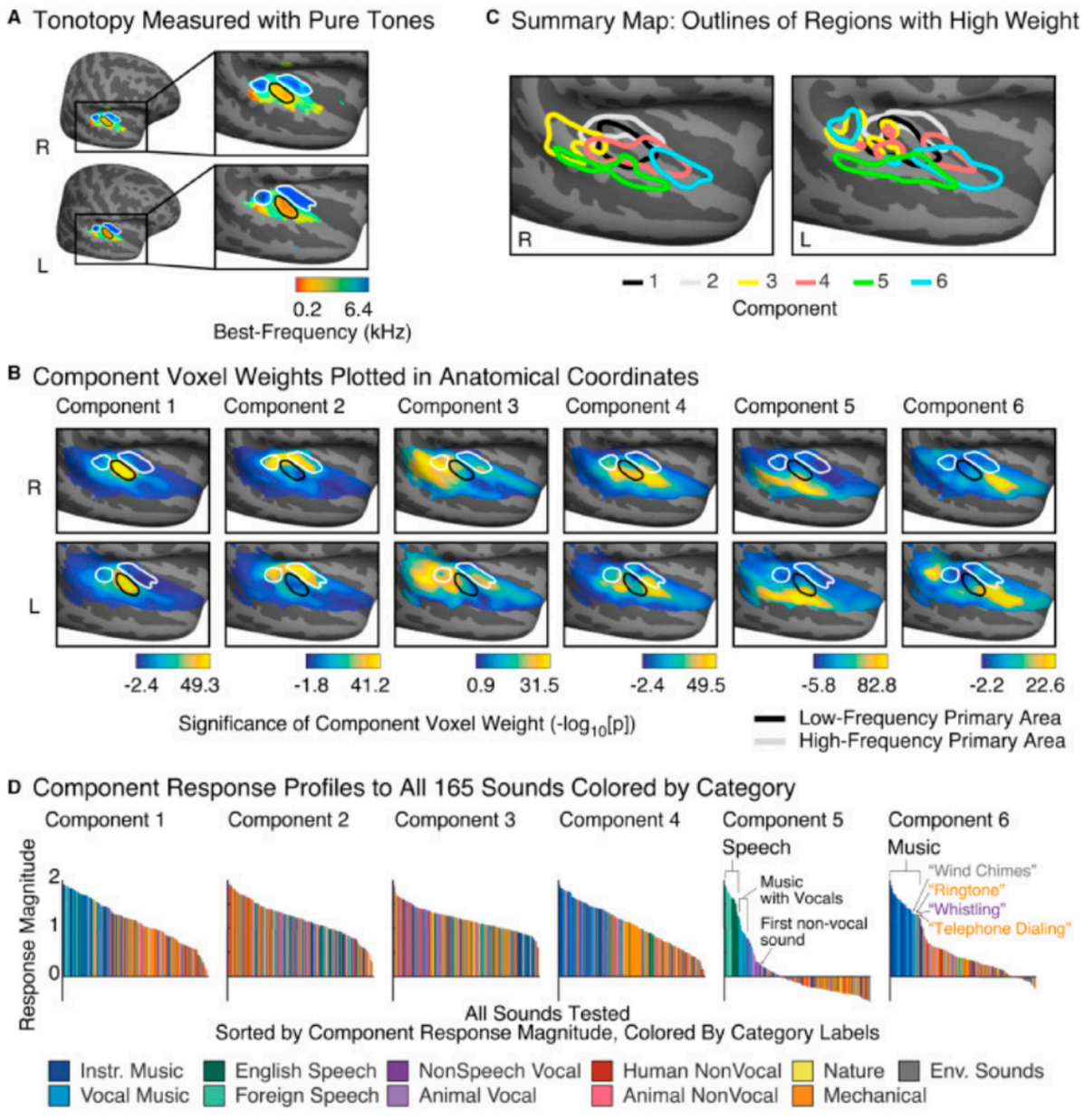
OTHER FEATURES?

* **Periodotopy** refers to the smooth mapping of temporal modulation selectivity across cortex



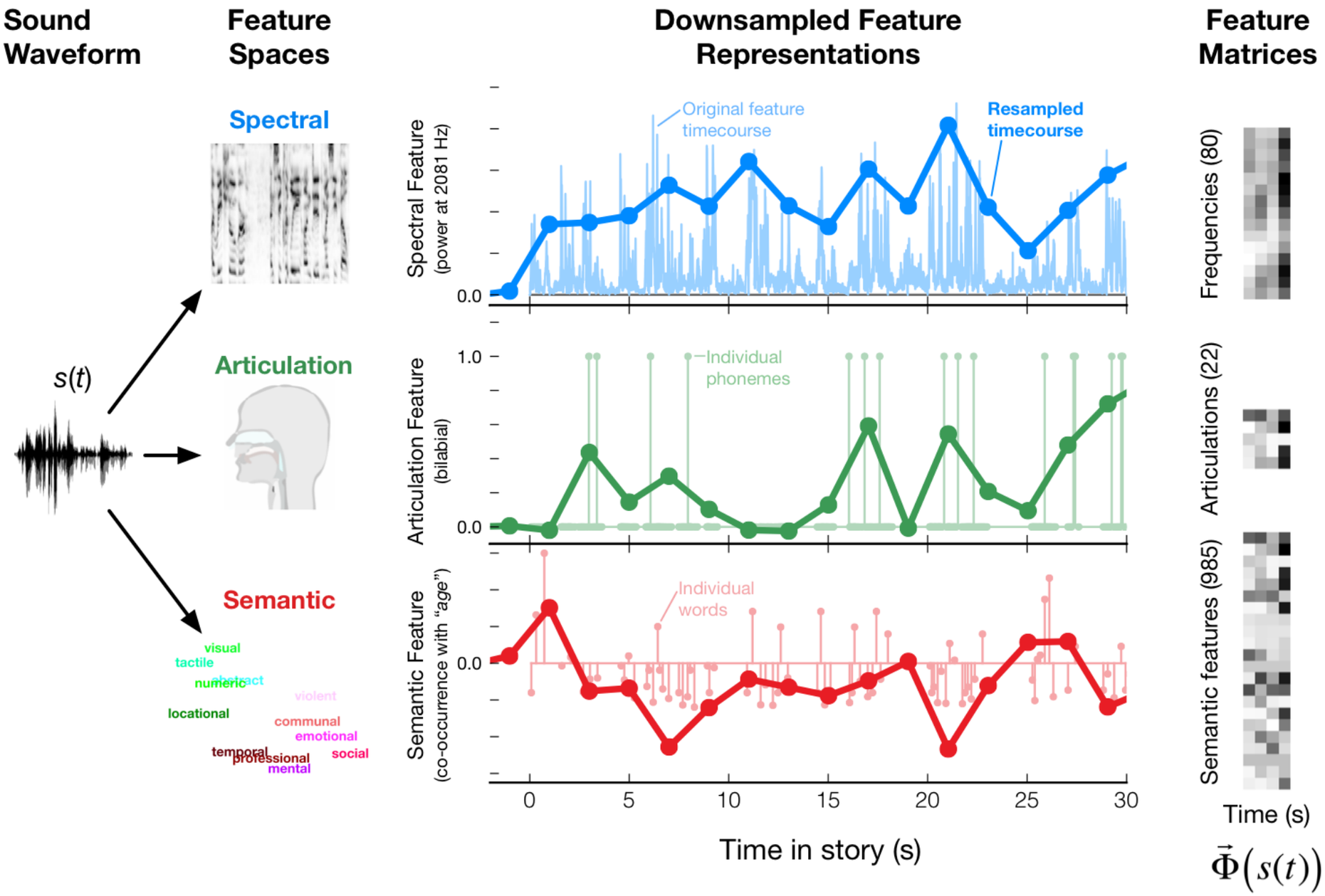
Brewer & Barton (2016)

OTHER FEATURES?



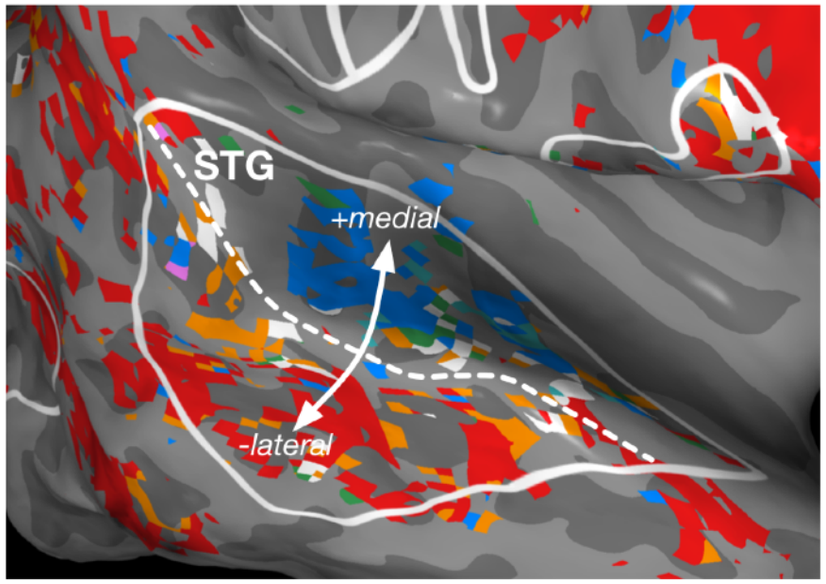
Norman-Haignere et al. (2015)

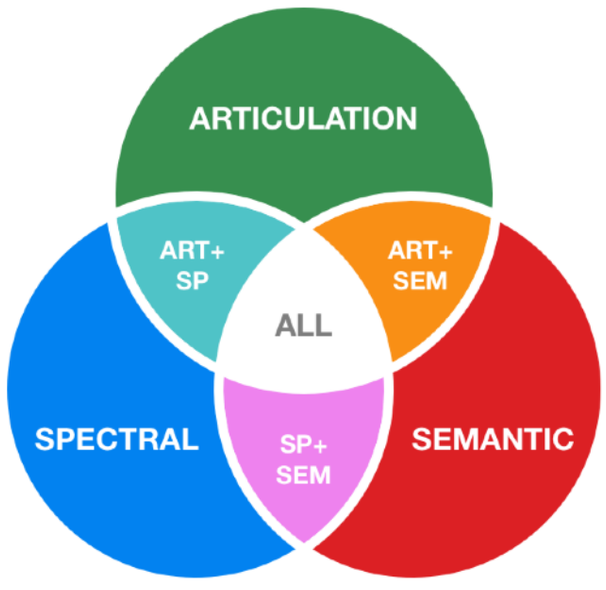
OTHER FEATURES?

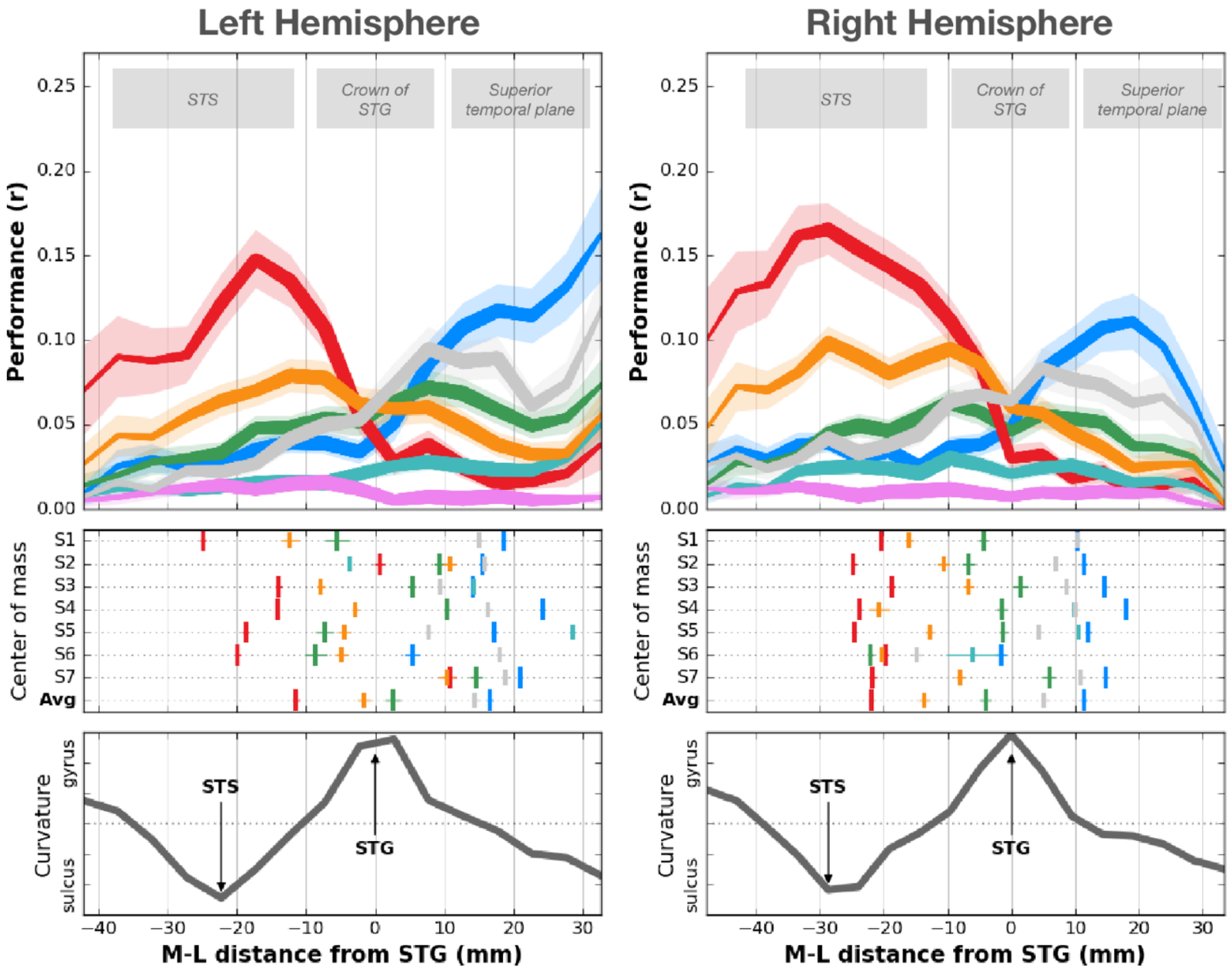


de Heer et al. (2017)

OTHER FEATURES?







de Heer et al. (2017)

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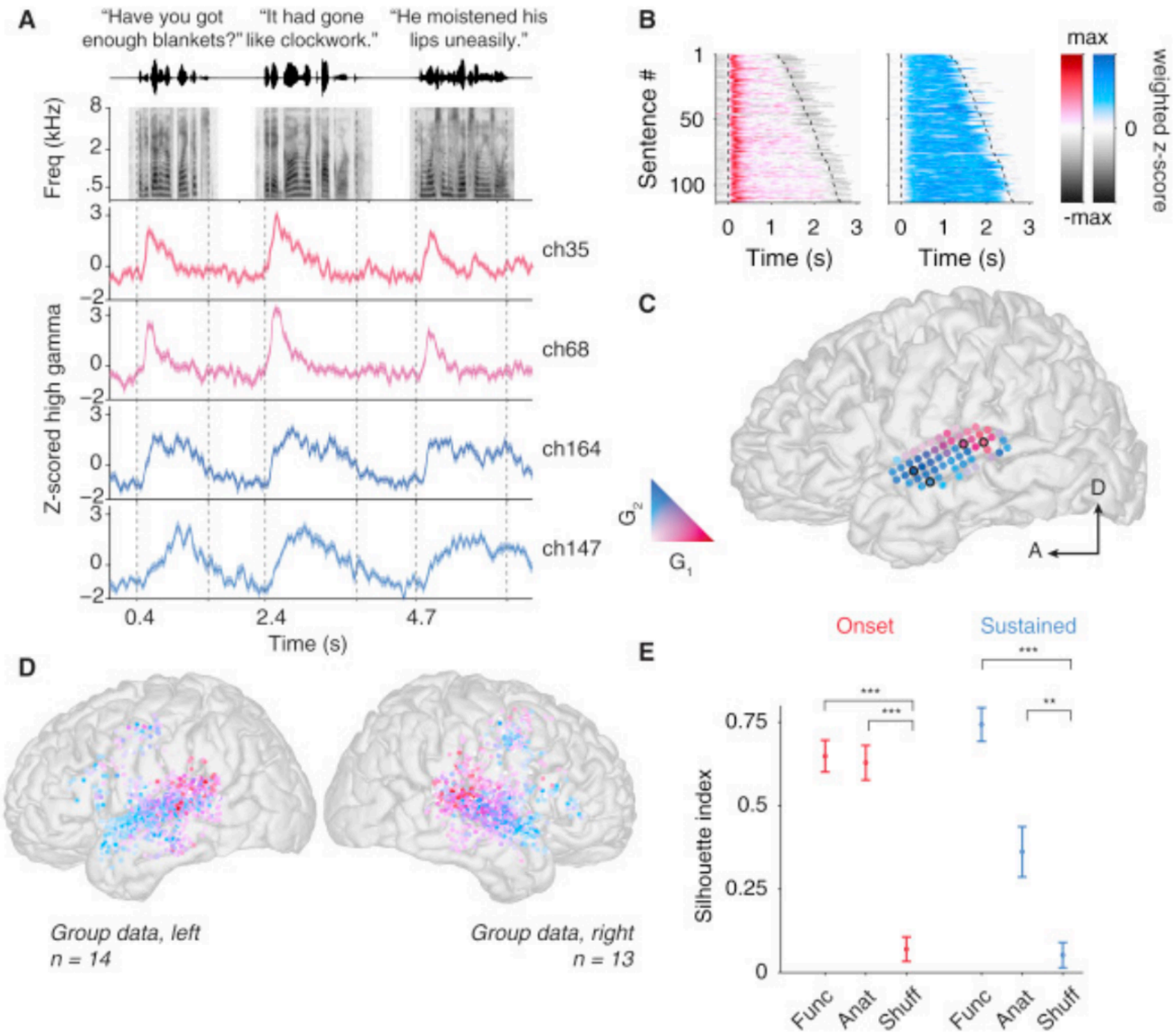

Hamilton et al. (2018)

UNTIL NEXT TIME