

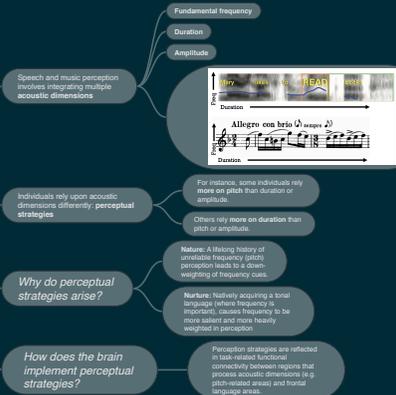
# Weighting of auditory dimensions in speech and music perception: individual differences and neural bases

## Authors

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**Cognition (in press)**  
<https://www.biorxiv.org/content/10.1101/2020.01.02.892943v3>

## Summary

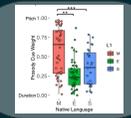


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# Study 2: Native language shapes speech and music perception

- Participants
  - 45 native Mandarin speakers - Tonal language
  - 45 native English speakers - Non-tonal language
  - 27 native Spanish speakers - Non-tonal language

## Experiment 1: Prosodic Cue Weighting



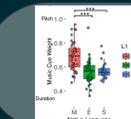
Participants categorized phrase boundary location

- Early Phrase Boundary after the verb "Barbara gives up, the ship will be discovered"
- Late Phrase Boundary after the object "Barbara gives up the ship, (it is discovered)"

Mandarin speakers weighted pitch more heavily than English and Spanish speakers when categorising spoken prosody

Pitch and duration indicated Early or Late phrase boundaries to varying degrees

## Experiment 2: Music Cue Weighting



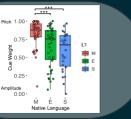
Participants categorized musical sequences

- Match time: "ONE two ONE two ONE two"
- Misfit time: "ONE two ONE two three"

Mandarin speakers weighted pitch more heavily than English and Spanish speakers when categorising musical rhythms

Pitch and duration indicated Match or Misfit time to varying degrees

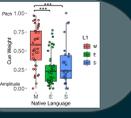
## Experiment 3: Dimension-selective Attention



Participants heard the phrase "study music" repeatedly

Participants judged which word was higher in pitch?

Result: Mandarin speakers were better able to rely on pitch to make judgments



Participants heard the phrase "study music" repeatedly

Participants judged which word was louder?

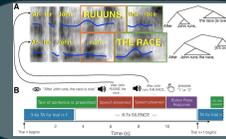
Result: English and Spanish speakers correctly relied on amplitude/loudness cues, but Mandarin speakers still weighted pitch cues heavily

This dataset still is an outlier for Mandarin speakers that they cannot group pitch cues which is a surprise

Kyle Jasmin  
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Adam Tierney  
**eLife (2020)**  
<https://elifesciences.org/articles/53539>

# Study 3: Brain connectivity and speech perception strategies

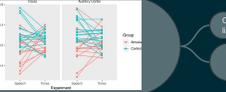
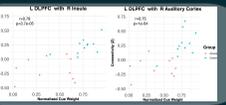
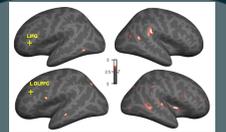
## Paradigm



## Procedure

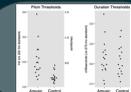
- Siemens Acanto 1.5T with 32-channel head coil
- Sparse temporal acquisition, TR=3.4s, TE=12.1s
- 3mm isotropic voxels

## Results

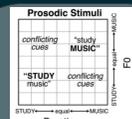


# Study 1: Congenital factors shape speech perception

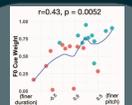
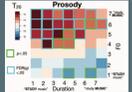
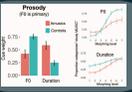
## Participants



## Procedure



## Results



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**JEPG:General (2020)**  
<https://psycnet.apa.org/fulltext/2019-59775-001.html>