

MUSIC TO MY EARS

TOP-DOWN EFFECTS IN MUSIC PERCEPTION

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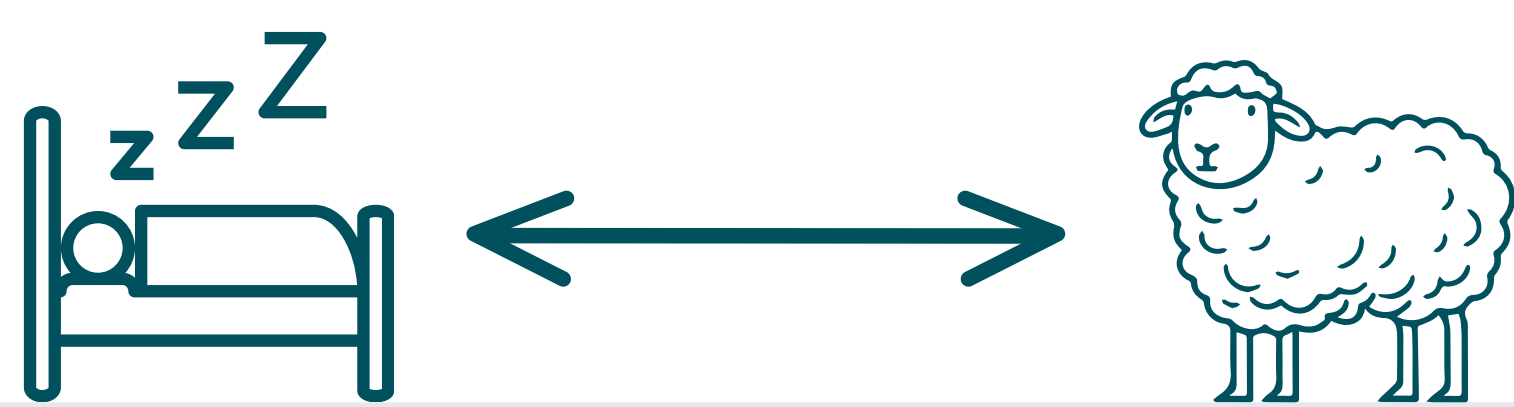
BACKGROUND

Speech perception can be influenced by:

- Phonological context (Mattys, 2013)
- Lexical context (Mattys, 2013)

Ganong effect: an example of lexical context influencing perception (Ganong, 1980)

- e.g. when you hear an ambiguous sound between /s/ and /sh/
 - more /s/ interpretation in “_leep” context
 - more /sh/ interpretation in “_eep” context



Lexical context biases interpretation of ambiguous phoneme **towards** context-consistent phoneme

A musical “Ganong” effect?

Music perception can be influenced by:

- Melodic context (McMurray et al., 2008)
- Chord context (McMurray et al., 2008)

In McMurray et al.: chord context shifted listener’s interpretation of a note away from the expected chord

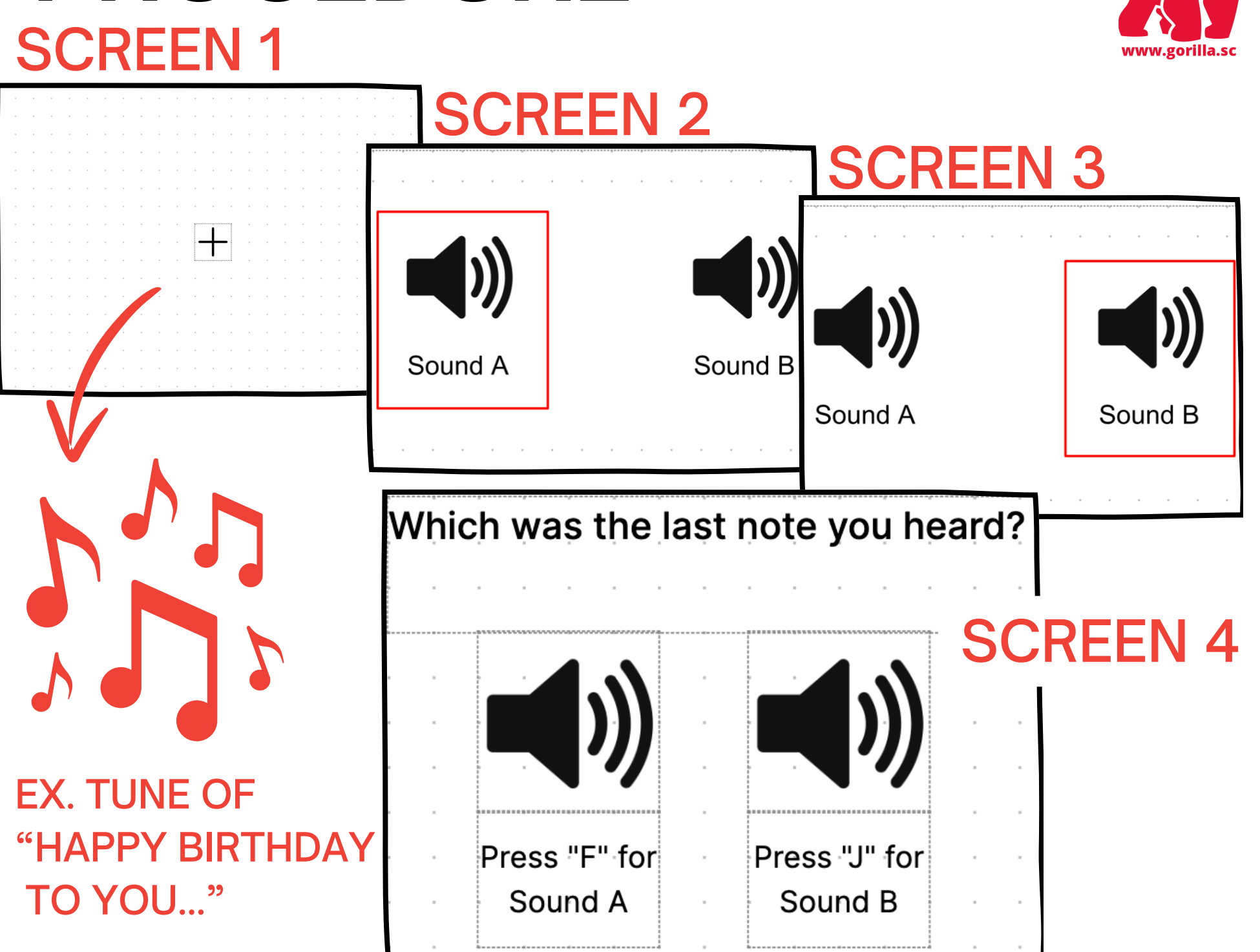
Musical context biases interpretation of ambiguous music note **away** from context-consistent note

RESEARCH QUESTION

- Is there a Ganong effect in musical contexts?
- Do listeners who exhibit more of a top-down effect in lexical contexts also exhibit more of a musical-context effect?



PROCEDURE



METHODOLOGY

Participants: 20 native English speakers with no formal musical training

Musical task:

- Each item consisted of either:
 - an isolated target note*
 - a target note in the context of a commonly known musical phrase
 - a target note in an unfamiliar musical context (“scrambled”).
- The context was either **A-biased** (in the key of C₀) or **B-biased** (in the key of C₅₀)

Lexical task:

- Each item consisted of:
 - a target vowel** presented in a lexical context
- The context was either consistent with [ɛ] or [i]

STIMULI

Musical task:

- *Target note: C₀ to C₅₀ continuum (6 steps)
 - C₀ is C/C4/middle C
 - C₅₀ is C + one quarter tone (C + 50 cents)

Lexical task:

- **Target vowel: [ɛ] to [i] continuum (5 steps)
 - [ɛ] = eh, as in less
 - [i] = ih, as in kid

RESULTS

- At group level, there is no clear musical “Ganong” effect (Fig. 1)
 - Some participants show bias towards the context-consistent musical note, but others do not (Fig. 3)
 - Generally, the task was difficult for participants, as seen by the **Single Note** condition (Fig. 3b)
 - There is a **context effect** where musical phrases of a certain key pattern similarly to scrambled musical phrases of the same key (Fig. 1)
- The **lexical** Ganong effect is still robust with the current lexical task (Fig. 2)

FIG. 1: GROUP-LEVEL MEANS AND STANDARD ERRORS OF C₅₀ RESPONSES IN THE MUSICAL TASK

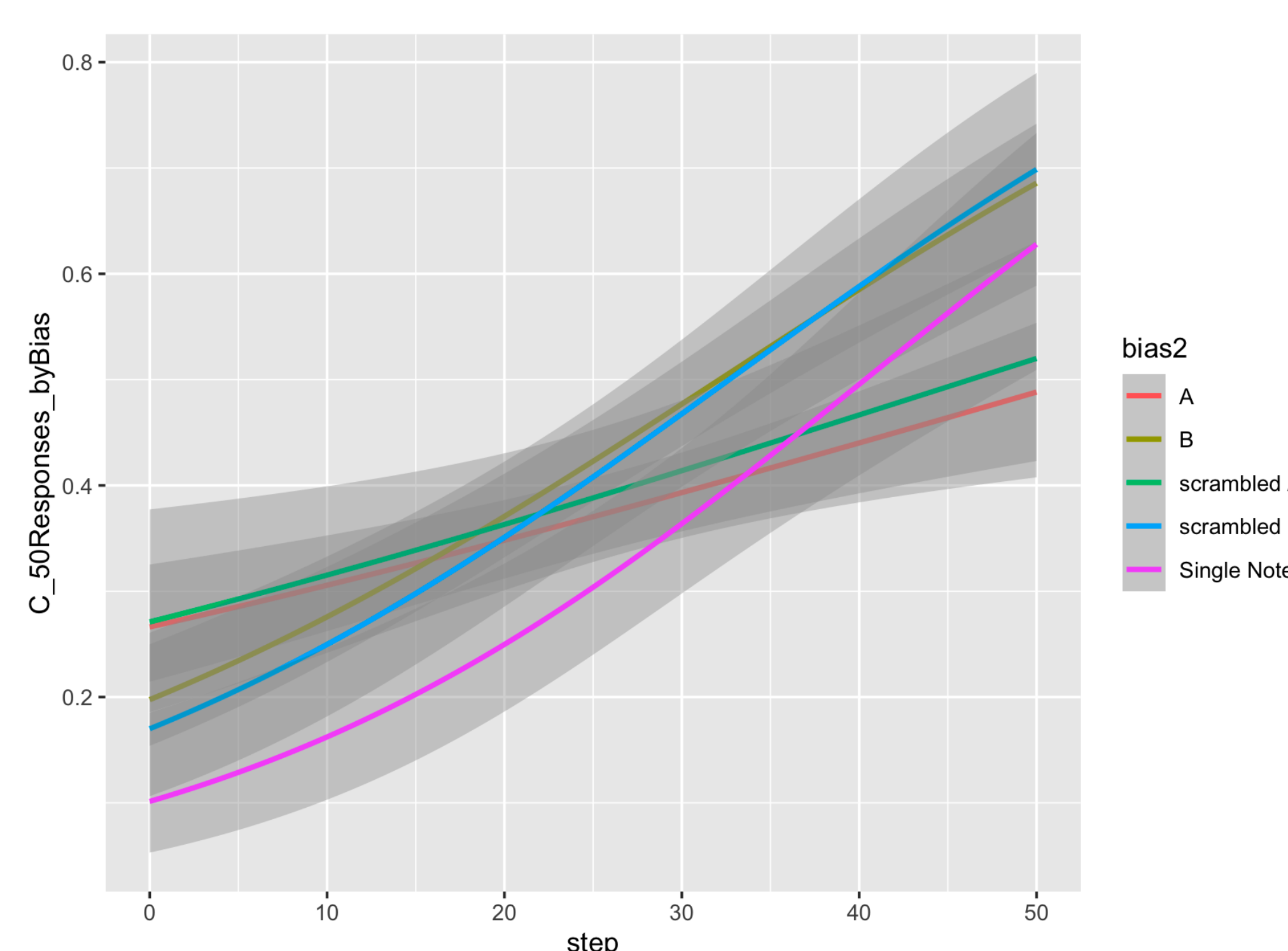


FIG. 2: GROUP-LEVEL MEANS AND STANDARD ERRORS OF [ɛ] RESPONSES IN THE LEXICAL TASK

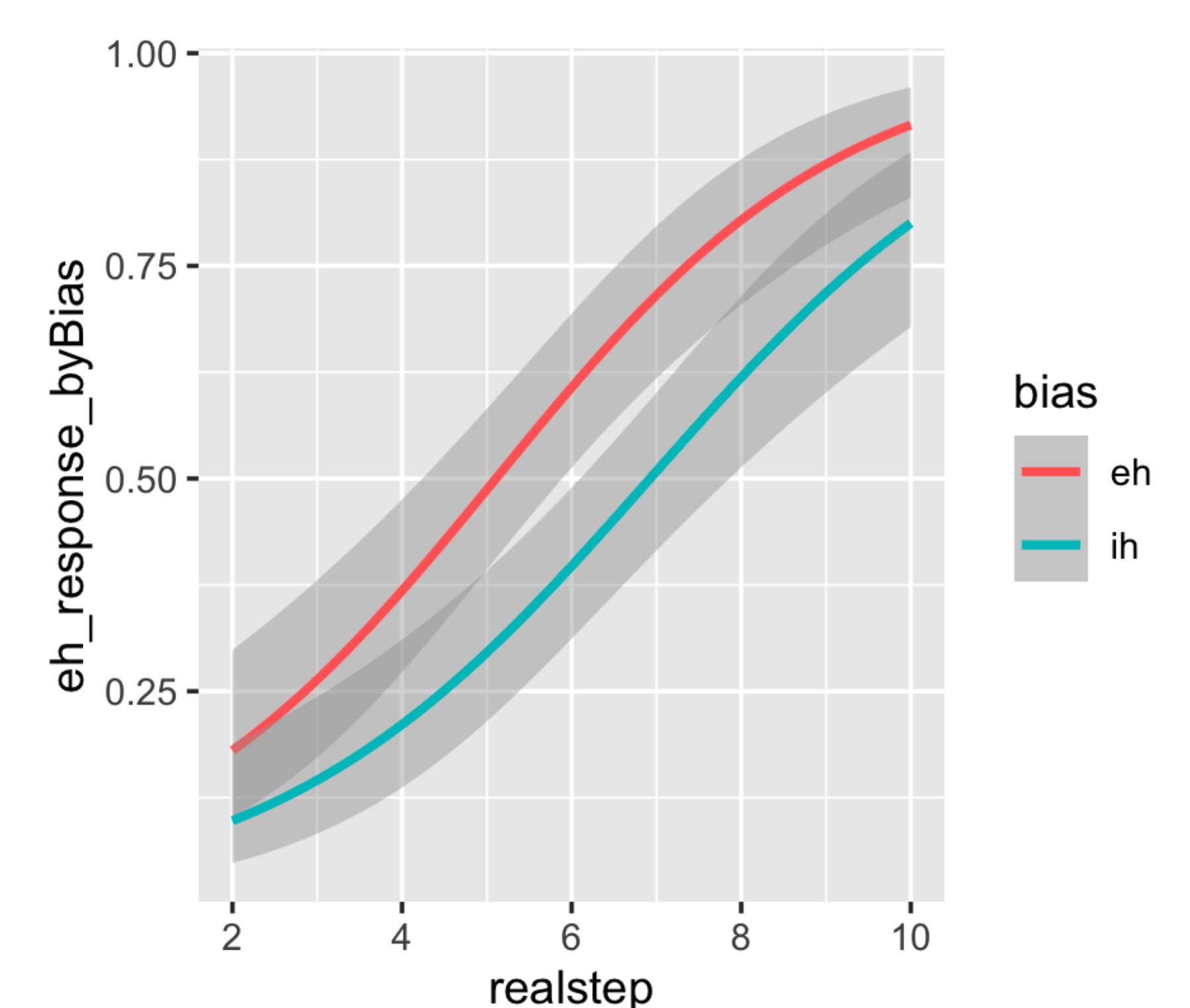
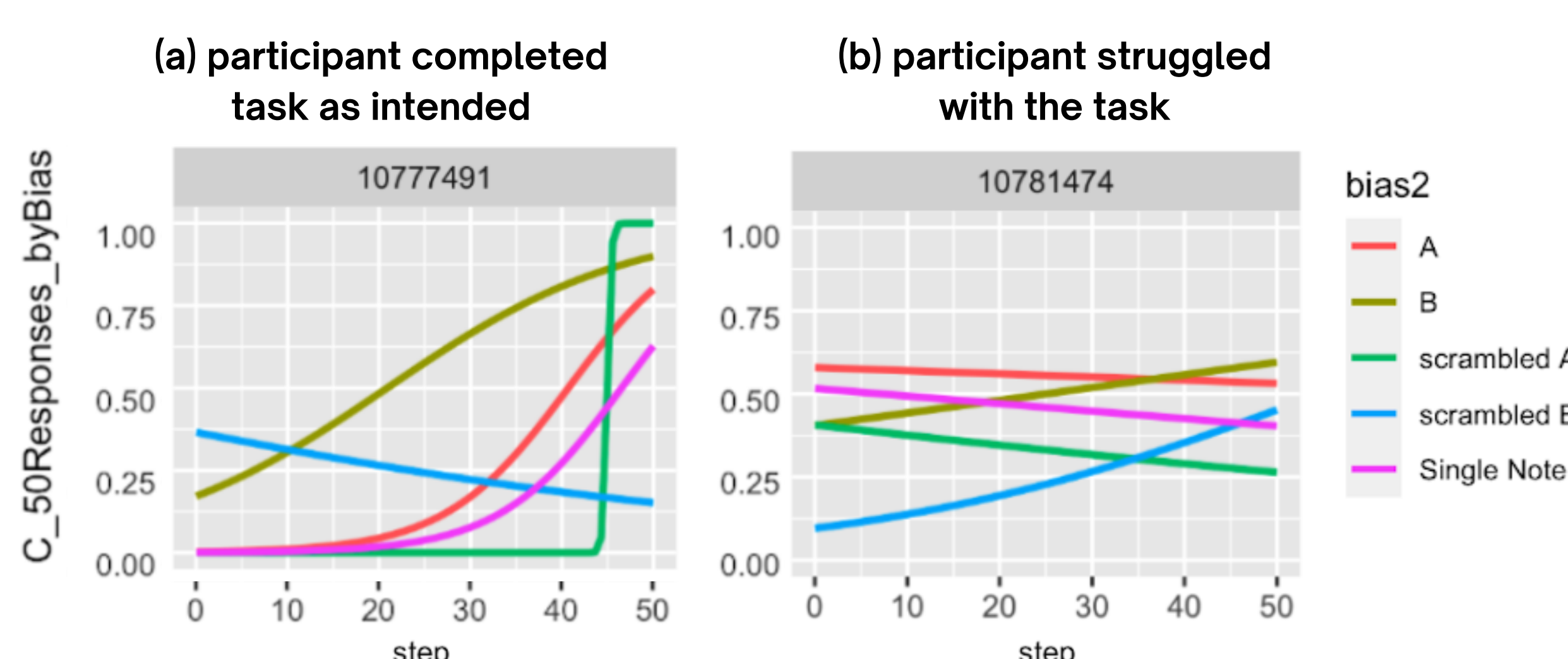


FIG. 3: INDIVIDUAL RESPONSES IN THE MUSICAL TASK



CONCLUSIONS

- Our modified **lexical** task shows the same effect as a classic Ganong task
- Group **music** results suggest that participants are responding to the **key** of the stimuli, rather than the **familiarity** of the individual songs
 - **Context effect** is present for the key rather than the stimulus itself
- **Individuals can differ greatly** in their perception of ambiguous musical notes, with and without context
- Flat patterning may be due to task **difficulty**, and/or inability for participants to distinguish between C₀ and C₅₀

MOVING FORWARD

- The mix of results from the music task suggests there is more work to be done in the exploration of this domain
- **Making the task easier:** we intend to repeat this task again with a broader spectrum of musical note tokens
- We hope to go back to our original research question and discover whether individuals’ **lexical** and **musical** context effects are correlated

references

Ganong, W. F. (1980). Phonetic categorization in auditory word perception. *Journal of Experimental Psychology: Human Perception and Performance*, 6(1), 110–125.
 Mattys, S. L. (2013). Speech Perception. In *Oxford Handbooks Online*. Oxford University Press.
 McMurray, B., Denhardt, J. L., & Struck-Marcell, A. (2008). Context Effects on Musical Chord Categorization: Different Forms of Top-Down Feedback in Speech and Music? *Cognitive Science*, 32(5), 893–920.