No impact of restricting facial movements on the perception of human affect vocalizations and instrumental sounds

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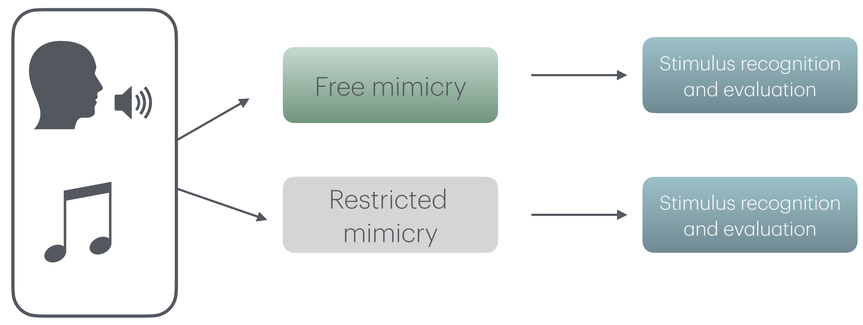
INTRODUCTION

Mimicry is a spontaneous imitation of perceived emotional expressions (Chartrand & Bargh, 1999)
Restricting facial mimicry using various procedures (pen-in-mouth, botox) disrupts emotion recognition (Oberman et al., 2007; Wood et al., 2016)
We also mimic vocal expressions of emotions with our faces (Hawk & Fischer, 2016; Wołoszyn et al., 2024).



Hypotheses:

1) Restricting mimicry hinders recognition of human vocalizations, especially vocal expressions of happiness
2) Restricting condition introduces a general positivity bias - valence ratings are higher irrespective of emotion category

METHODS

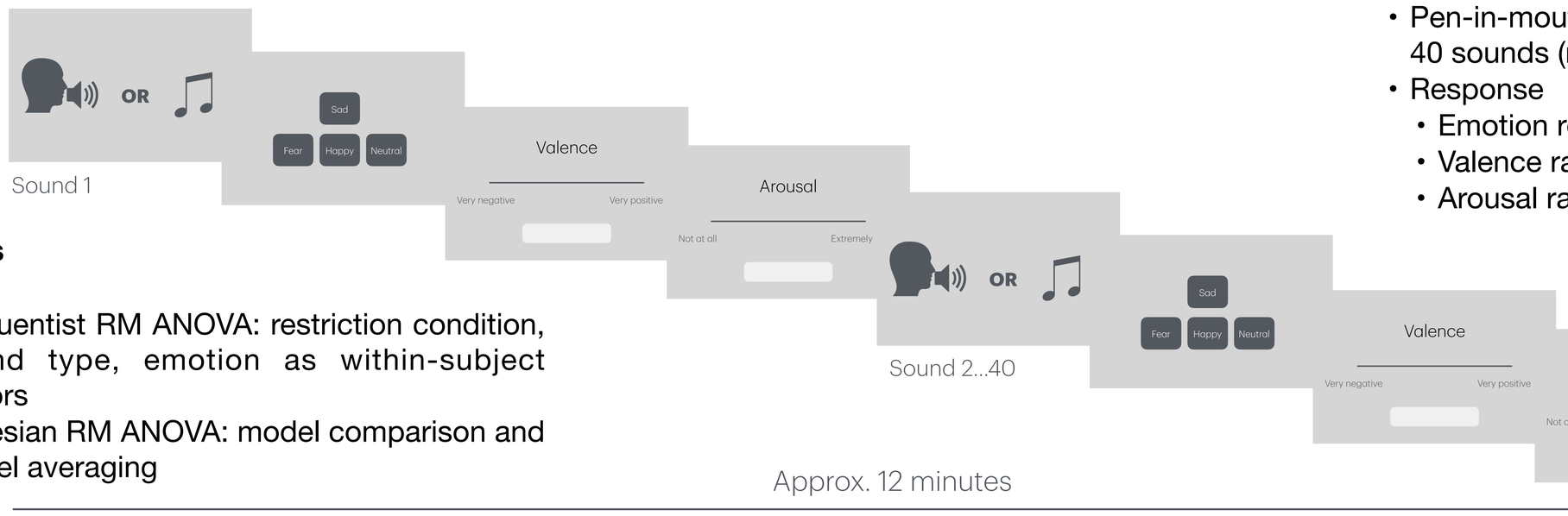
Participants

- 67 (1 - α = 0.05; 1 - β = 0.8; small effect size: f = 0.15)
- M_{age} = 23.2 yo (SD = 4.92)

Stimuli

- 80 sounds: **nonverbal expressions of emotions** (fear, happiness, sadness) and neutral sounds (approx. 1.5 s)
  - **Vocal** (40, e.g., crying, shouting) and **instrumental** (40, simple melodies)
- Source: Montreal Affective Voices (Belin et al., 2008) & Musical Emotional Bursts (Paquette et al., 2013).

Structure of one block



Approx. 12 minutes

Task

- Pen-in-mouth procedure: two blocks of 40 sounds (restricting and control conditions)
- Response
  - Emotion recognition: 4-option forced-choice
  - Valence rating on a visual-analog scale
  - Arousal rating on a visual-analog scale

Analysis

- Frequentist RM ANOVA: restriction condition, sound type, emotion as within-subject factors
- Bayesian RM ANOVA: model comparison and model averaging

RESULTS

Accuraccy

Emotion (F(3, 198) = 24.45, p < .001, η^2_p = 0.27; BF_{incl} > 100)
Sound type (F(1, 66) = 178.87, p < .001, η^2_p = 0.73; BF_{incl} > 100)
Sound type × Emotion (F(3, 198) = 13.59, p < .001, η^2_p = 0.17; BF_{incl} > 100)
Restricting condition (F(1, 66) = 0.58, p = .449, η^2_p < 0.01; BF_{excl} = 18.87)
Emotion × Type × Restricting (F(3, 198) = 2.53, p = .060, η^2_p = 0.04; BF_{excl} > 100)

Reaction Times

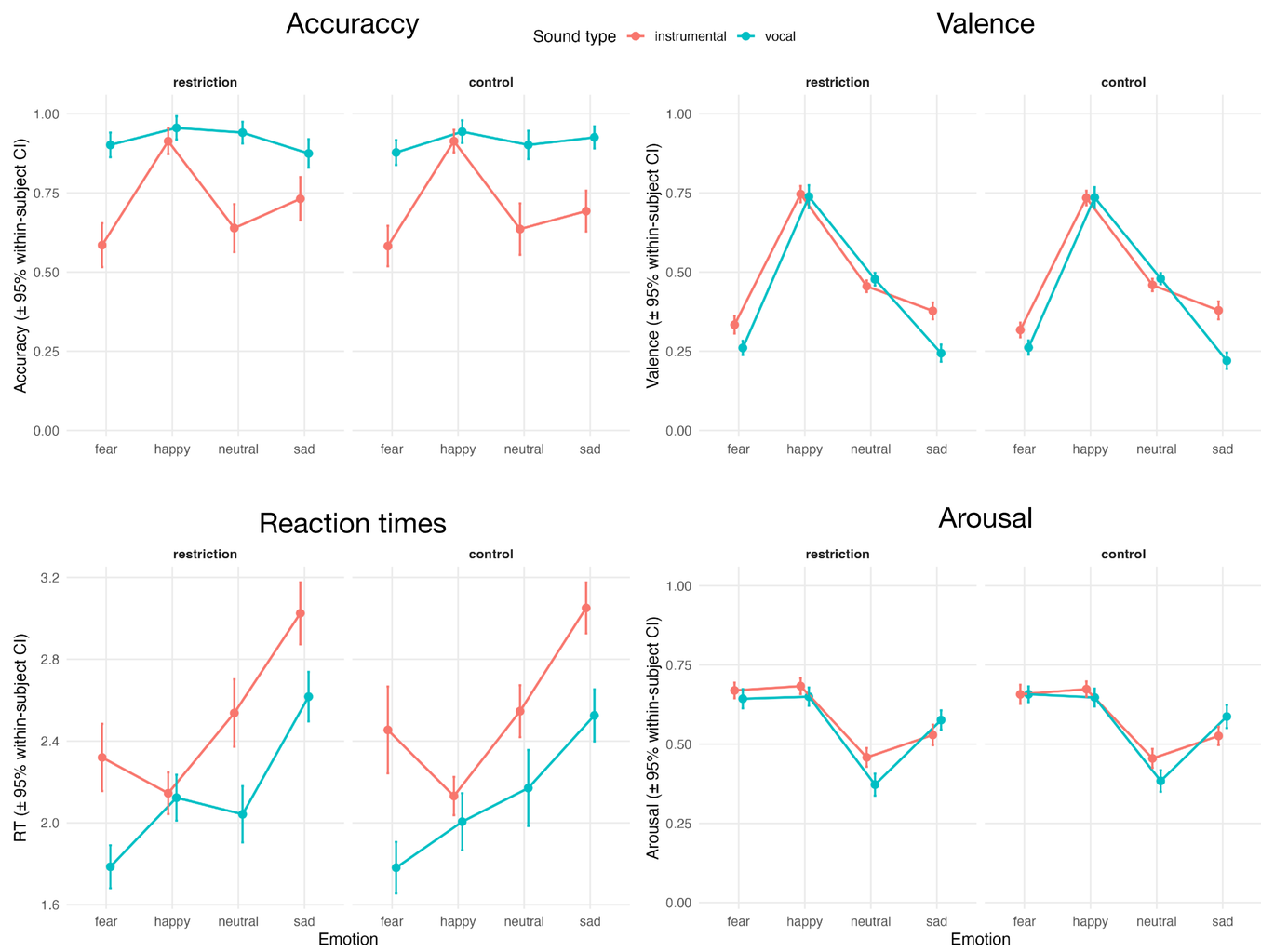
Emotion (F(3, 132) = 59.41, p < .001, η^2_p = 0.58; BF_{incl} > 100)
Sound type (F(1, 44) = 112.76, p < .001, η^2_p = 0.72; BF_{incl} > 100)
Sound type × Emotion (F(3, 132) = 5.15, p = .004, η^2_p = 0.11; BF_{incl} = 31.65)
Restricting condition (F(1, 44) = 0.35, p = .556, η^2_p = 0.01; BF_{excl} = 9.26)
Emotion × Type × Restricting (F(3, 132) = 1.56, p = .207, η^2_p = .034; BF_{excl} > 100)

Valence

Emotion (F(3, 198) = 457.632, p < .001, η^2_p = 0.87; BF_{incl} > 100)
Sound type (F(1, 66) = 37.0, p < .001, η^2_p = 0.36; BF_{incl} > 100)
Sound type × Emotion (F(3, 198) = 39.45, p < .001, η^2_p = 0.37; BF_{incl} > 100)
Restricting condition (F(1, 66) = 1.27, p = .265, η^2_p = 0.02; BF_{excl} = 12.5)
Emotion × Type × Restricting (F(3, 198) = 1.90, p = .139, η^2_p = 0.03; BF_{excl} > 100)

Arousal

Emotion (F(3, 198) = 122.98, p < .001, η^2_p = 0.65; BF_{incl} > 100)
Sound type (F(1, 66) = 2.33, p = .132, η^2_p = 0.034; BF_{incl} > 100)
Sounds type × Emotion (F(3, 198) = 14.92, p < .001, η^2_p = 0.18; BF_{incl} > 100)
Restricting condition (F(1,66) = 0.01 , p = .917 η^2_p < 0.01; BF_{excl} = 15.63)
Emotion × Type × Restricting (F(3, 198) = 0.19 , p = 0.902 , η^2_p < 0.01; BF_{excl} > 100)



SUMMARY

- Emotion recognition, as well as valence and arousal ratings depended on emotion category and the type of sounds.
- The recognition and evaluation of happy sounds did not differ depending on the emotion category
- Restriction condition did not influence any dependent variable.
- Bayesian analysis provided substantial to strong evidence for the null effect of the restricting condition across measures.

The poster

CONCLUSIONS

Restricting mimicry does not affect the recognition of emotional sounds, regardless of sound type and given sufficient statistical power.

These results challenge embodied accounts of emotional sound recognition.