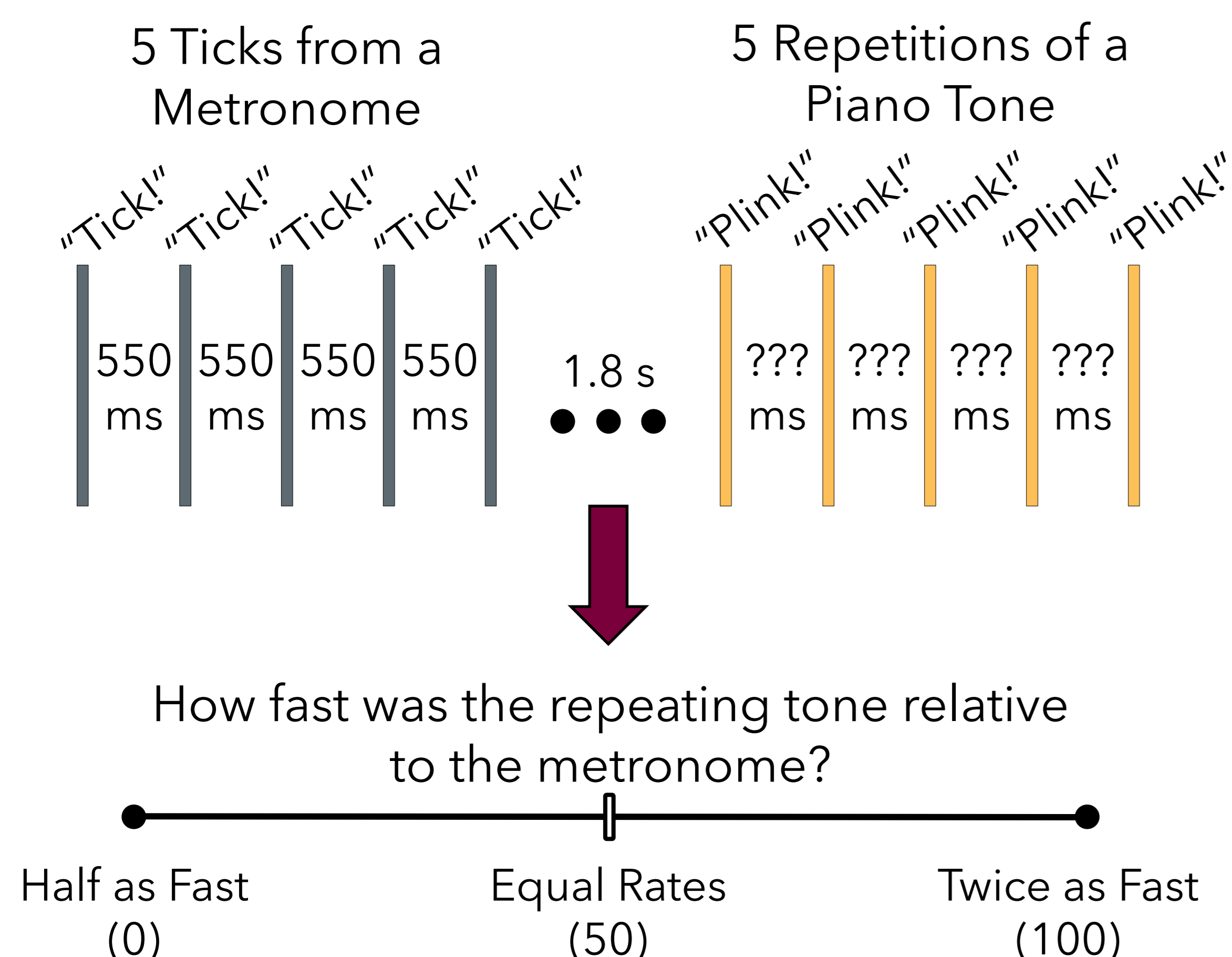


Background

- Accurate tempo tracking helps direct our attention to critical moments in speech and music.^{4,5}
- Acoustic and contextual features can alter perceived tempo and induce illusions of tempo change.^{1,3}
- Prior studies suggest people perceive higher-pitched speech/music as faster but compared only one lower register to one higher register.^{1,2}
- **Research Questions:**
 1. Is the effect of pitch consistent across several octaves?
 2. Can synchronous movements attenuate illusory tempo effects?
 3. How can we explain the ability of acoustic features to influence time perception?

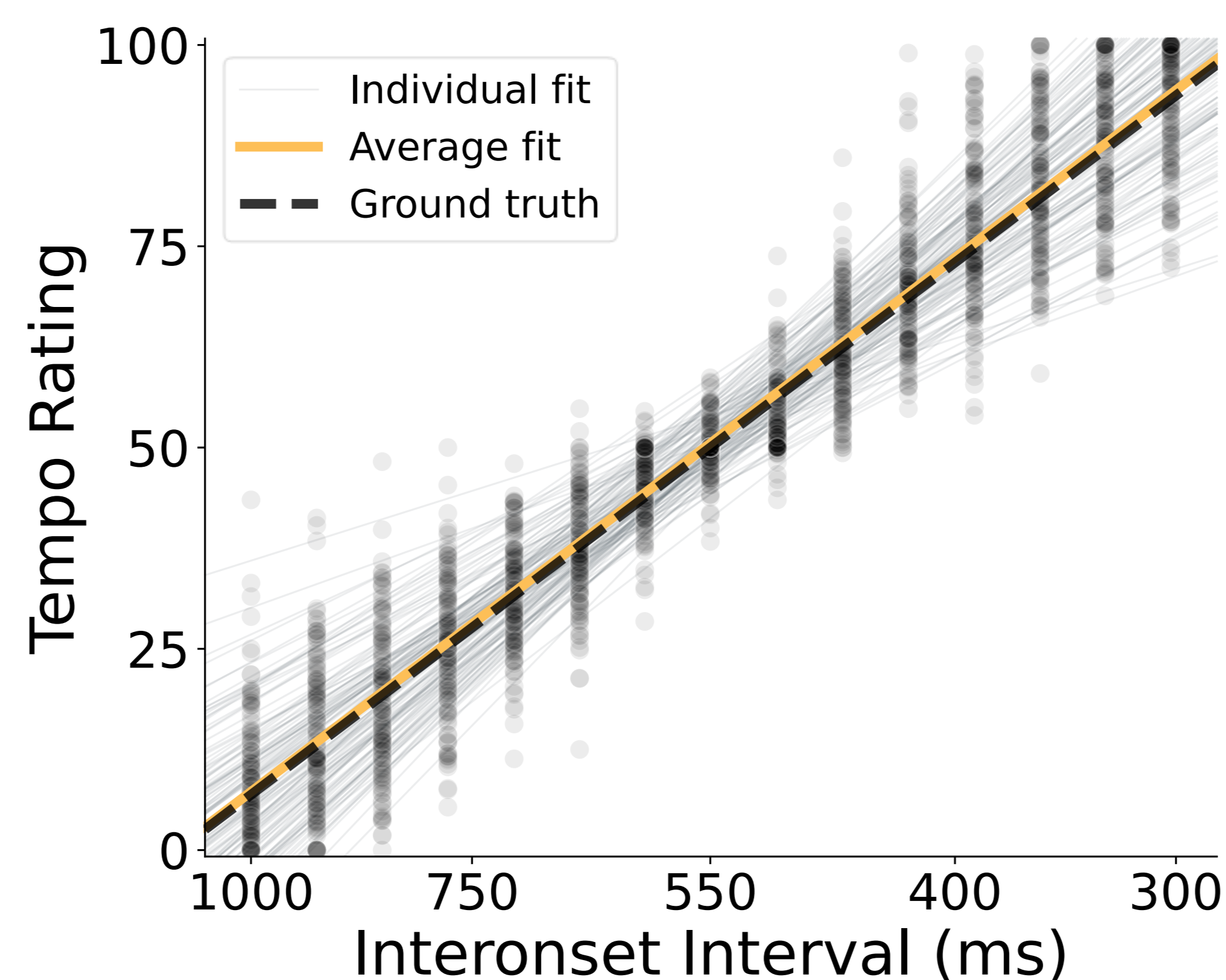
Methods

- **Participants:** 125 (65 tap; 60 no-tap)
- **Design: (Experiments 1 & 2)**
 1. Tone ranged from A2 (110 Hz) to A7 (3520 Hz)
 2. Tone repeated at one of 15 rates between 1000 and 302 ms
 3. Instructed half of participants to tap with stimuli
- **Relative Tempo Judgment Task:**



Results

Raw Tempo Ratings

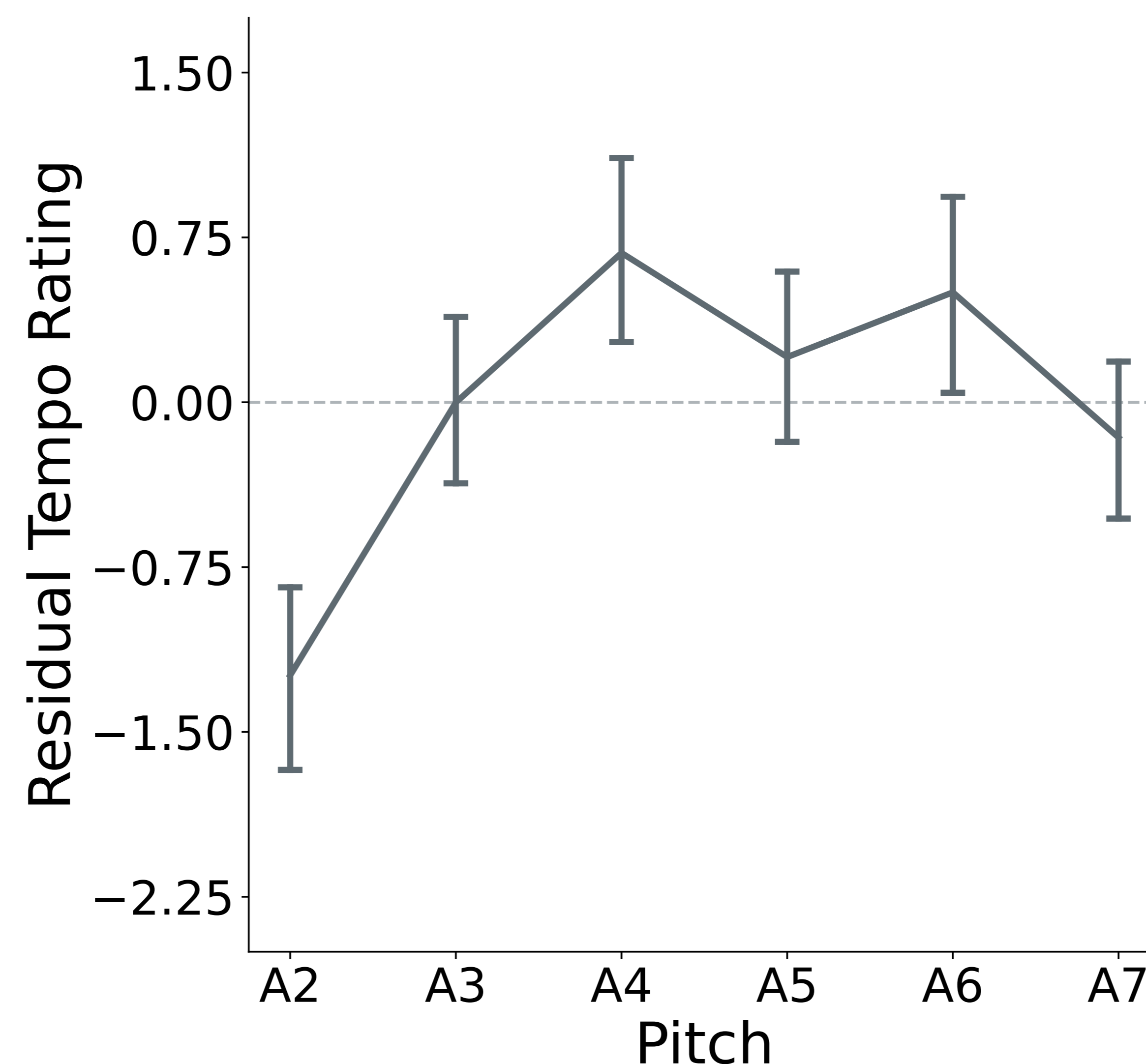


Raw tempo rating refers to the raw response on a 100-point scale.

Residual tempo rating refers to any part of a participant's response not accounted for by the tone's tempo.

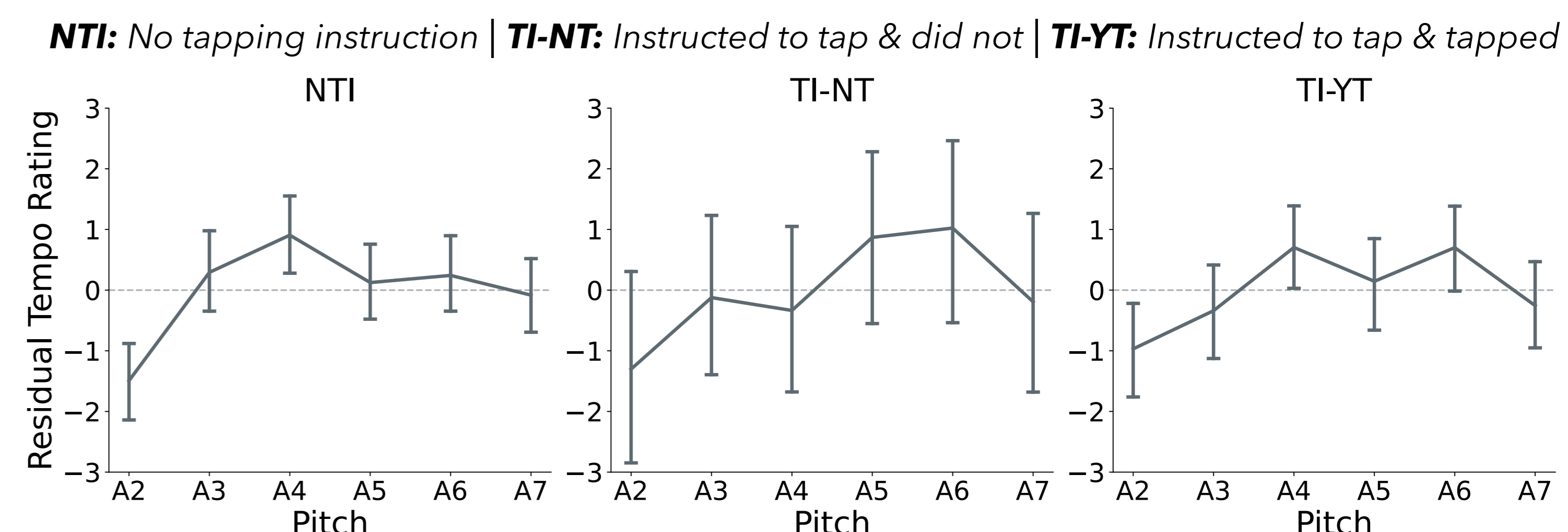
Participants' ratings did not differ on average from true relative tempo.

Illusory Tempo Effect



Pitch height exerted a **positive linear** and **negative quadratic** effect on tempo ratings, with perceived tempo peaking between A4 and A6.

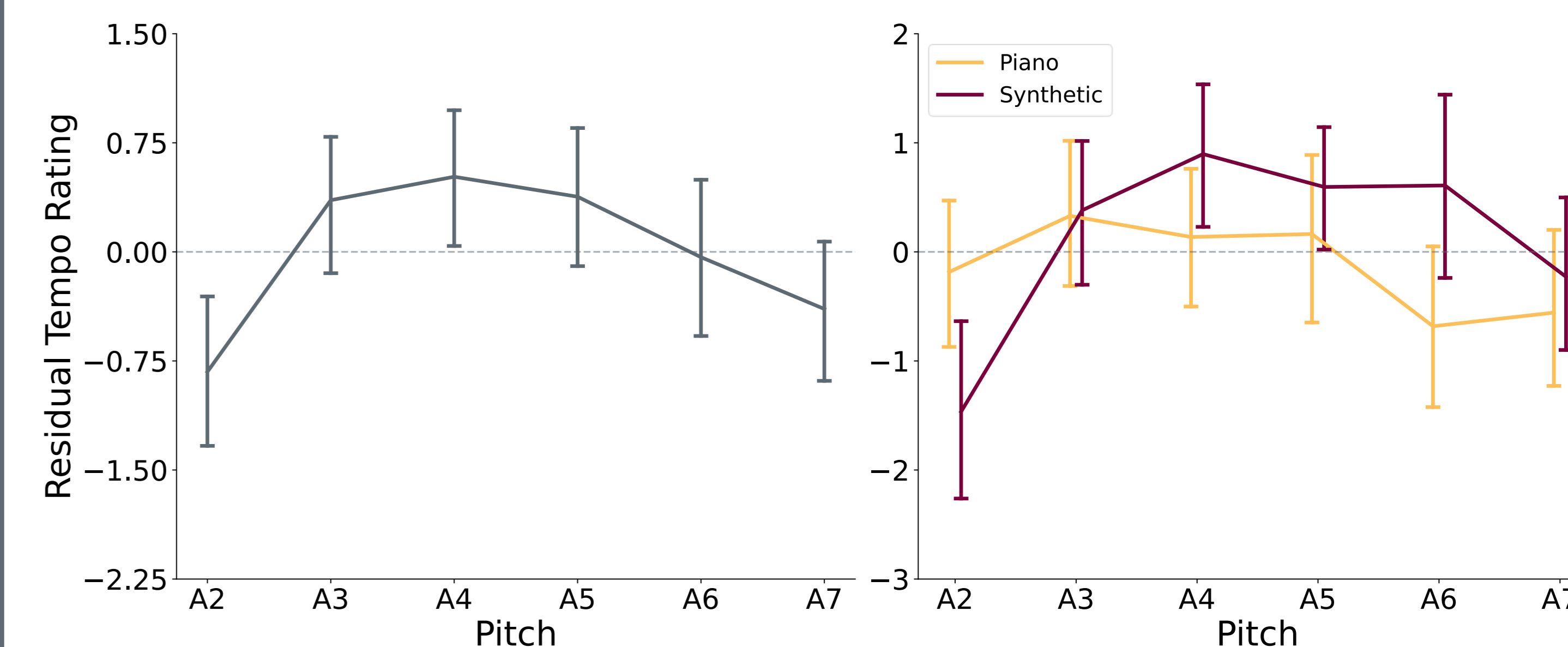
Synchronous Tapping



Synchronous tapping did **not attenuate** the illusory tempo effect.

Timbre (Experiment 3)

- **Participants:** 59
- **Design:** Half of trials used piano tones, half synthetic tones



U-shaped effect was **not an artifact** of low-pitched noise in piano tones.

Discussion

- Current findings challenge the idea that perceived tempo varies monotonically with **pitch height**.
- Learned priors as to the **expected tempo** of different stimuli may bias entrainment processes.
- Alternatively, perceived tempo may be correlated with the **ease of processing** of the stimulus.
- Synchronous tapping did **not attenuate** the influence of pitch.
- Future work aims to model this timing distortion within the framework of **Dynamic Attending Theory**.^{4,5}

References

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