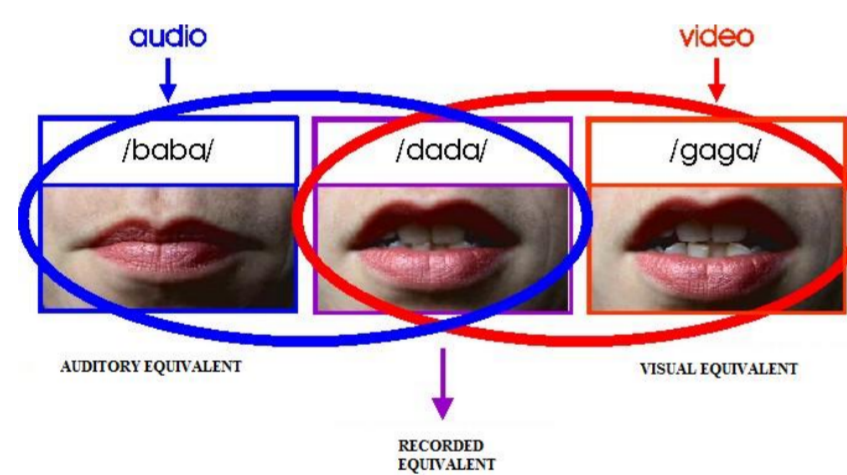
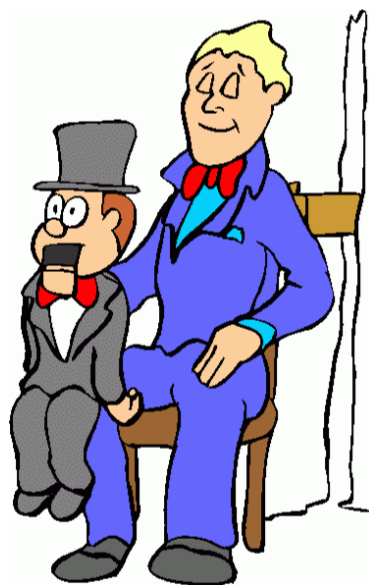


INTRODUCTION

We know from everyday experiences that what we see affects what we hear, particularly in speech and communication.

- **McGurk Effect** (McGurk & MacDonald, 1976): The sound and movement of the lips effect what speech sounds observers' hear.
- **Cocktail Party Phenomenon** (Cherry, 1953): In a noisy, crowded room, it is easier to understand someone if you can see his or her lip movements.
- **Ventriloquism Effect** (Bertelson, 1999): The moving mouth of the ventriloquist's dummy captures the operator's voice.



RESEARCH QUESTIONS

Synchrony between visual and auditory components: In speech and communication, we strongly integrate what we see and hear for speech sounds and lip movements that change in rhythm.

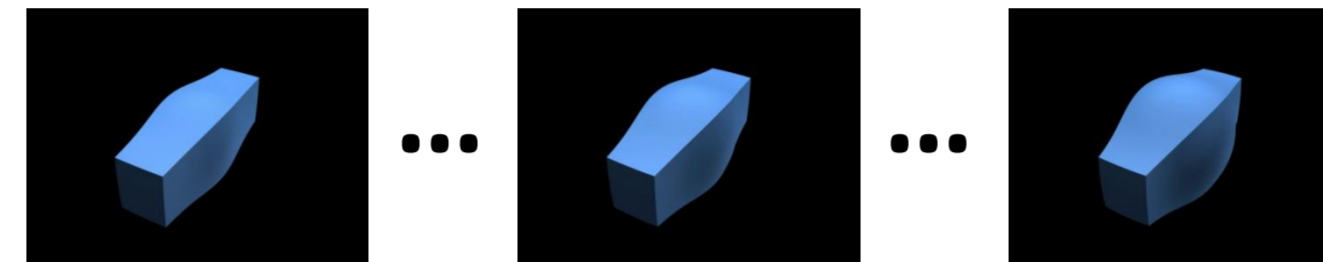
1. Does visual information change our perception of **non-speech** sounds?
2. Do non-speech sounds change our perception of **non-facial** visual information?
3. What effect does synchrony have on non-speech sounds and non-facial visual information?

References: Bertelson, P. (1999). In: Cognitive contributions to the perception of spatial and temporal events. 347–363; Cherry, C. (1953). *Journal of Acoustic Society of America*, 25, 975–979; McGurk, H., & MacDonald, J. (1976). *Nature*, 264, 746–748.

Special thanks to: Suzanne Pinkney for participant recruitment and Ali Raza for initial pilot work.

AUDIO-VISUAL (AV) STIMULI

VISION: Visual bulging shape

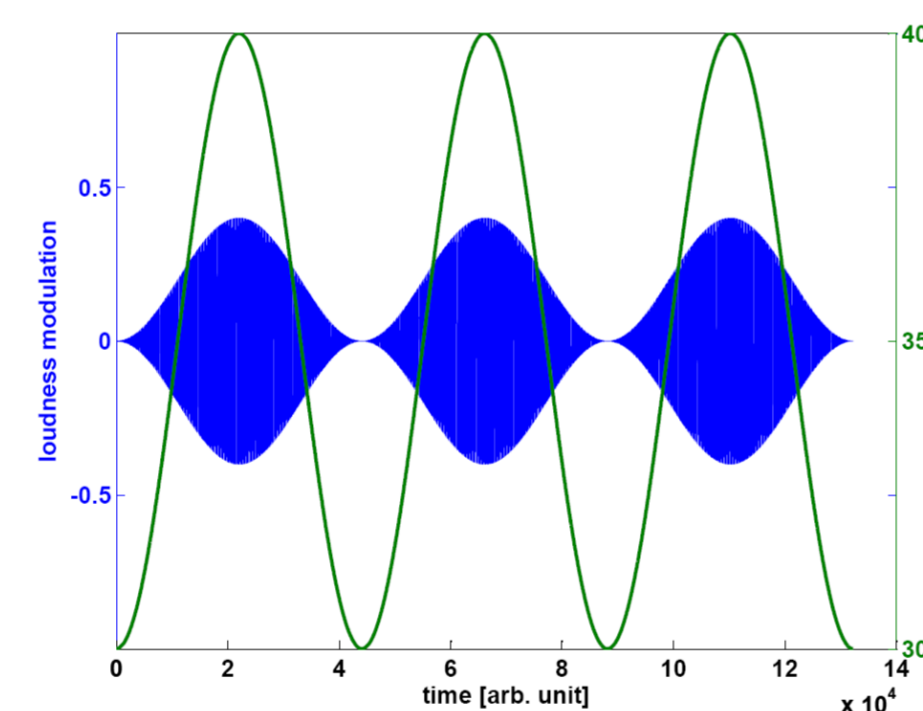


AUDITION: Pure 250 Hz Tone whose loudness increases and decreases over time

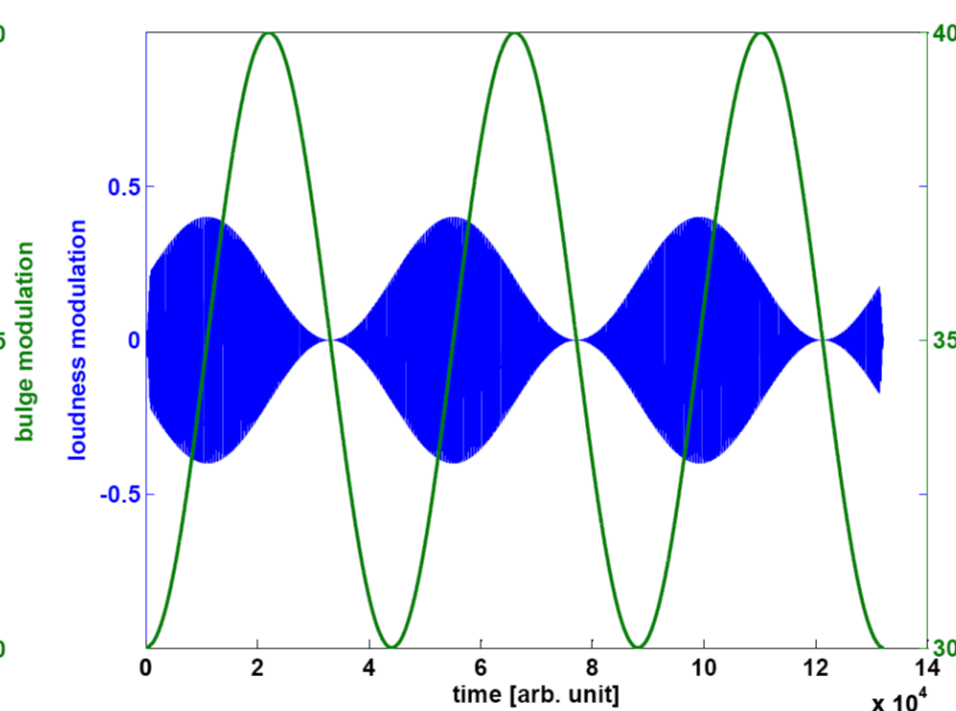


Stimulus Presentations: 16 participants were shown 2 AV stimuli one after the other. For one stimulus, the visual and auditory components were **congruent**, and for the other stimulus, the visual and auditory components were **incongruent**.

1. Congruent Condition



2. Incongruent Condition



Congruent Condition: the shape reached its largest size at the same time that the tone reached its loudest volume

Incongruent Condition: the shape reached its largest size at a different time than when the tone reached its loudest volume

APPARATUS

- Participants sat in front of a computer monitor
- Sound was delivered through headphones
- Participants responded by pressing keys on a keyboard

PROCEDURE

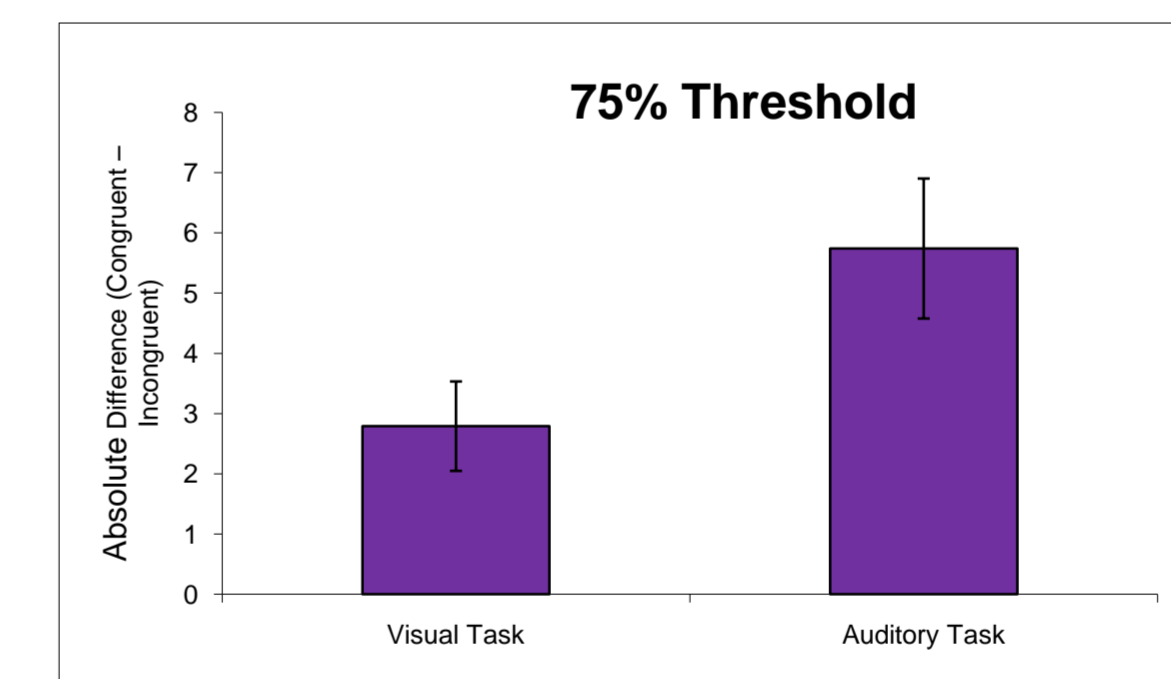
Tasks:

- **Visual:** Participants judged which of the 2 AV stimuli bulged the most (there were no loudness differences between the audio components)
- **Auditory:** Participants judged which of the 2 AV stimuli was the loudest (there were no shape differences between the visual components)

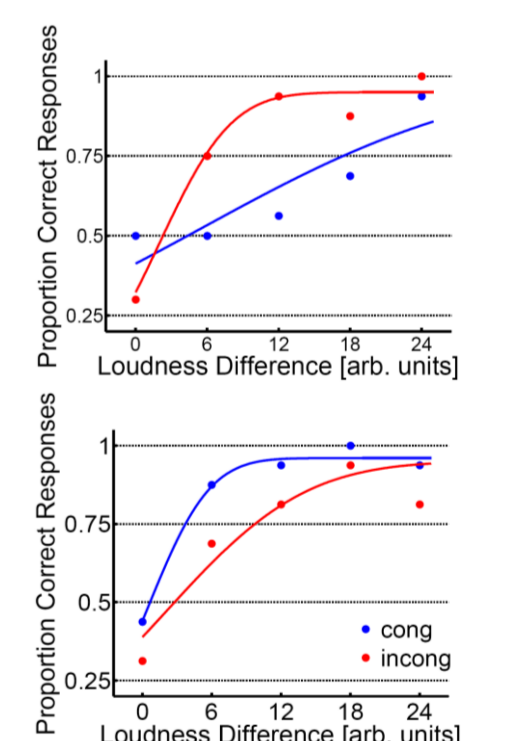
Task Performance Measure:

- 75% (accuracy) threshold difference between the 2 congruency conditions in either direction for each task (**smaller = less effect of congruency**)

RESULTS



Individual Data



1. **Synchrony is important for non-speech AV stimuli:** For both tasks, the absolute difference was greater than 0.
2. **Stronger effect of vision on audition:** Performance on audio task was more influenced by incongruent visual information than vice versa.
3. **Individual differences:** People used the synchrony between vision and audition differently.

TAKE-HOME MESSAGE

Sight and sound interact: To help understand speech and other non-speech AV events in the environment, humans rely on the synchrony between vision and audition.