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# Negatively correlated individual differences in audiovisual asynchrony

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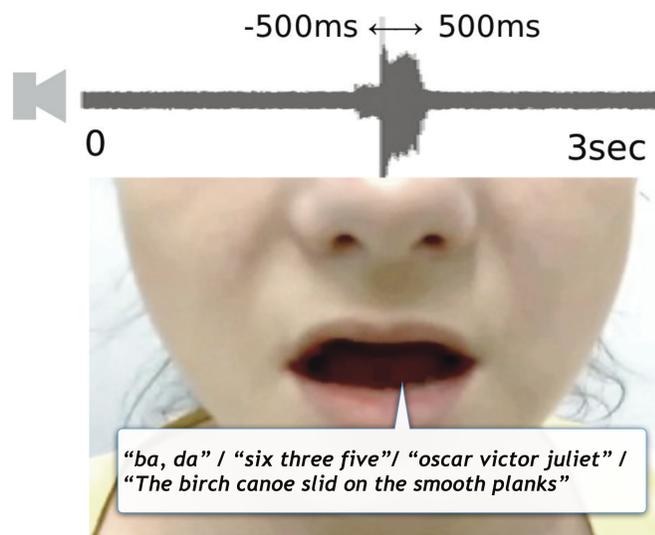
British Academy  
Leverhulme



## Background / Aims

- Sight and sound are out of synch
- Different measures of perceptual asynchrony correlate *negatively*
  - e.g. if vision subjectively leads audition in one individual, the same individual might show an opposite visual lag in other measures of audiovisual integration.
- Freeman, Ipser et al, (2013) *Cortex* 49
- Previously observed using McGurk and Stream/Bounce illusions, versus Temporal Order Judgement, in dual task
- Goals:** Generalise to different stimuli and tasks; constrain theory

## Methods

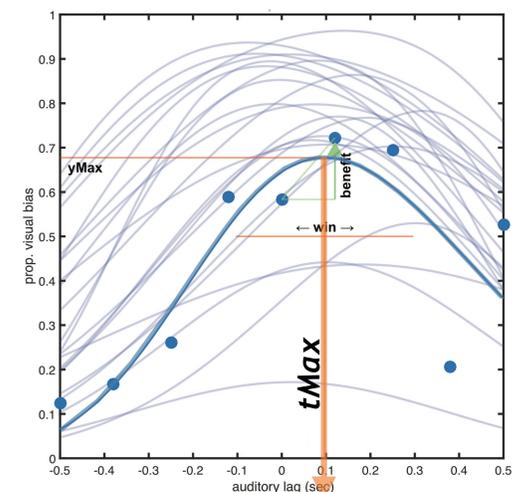


**Asynchronous lips + voice + background noise**

- Identification or comprehension rating
- Temporal order judgement (TOJ)

**Dual (concurrent) versus Single tasks**

## Performance as function of asynchrony



## Dependent measures

tMax: Asynchrony for optimal PSS: Point of subjective simultaneity

## Results

### Participants

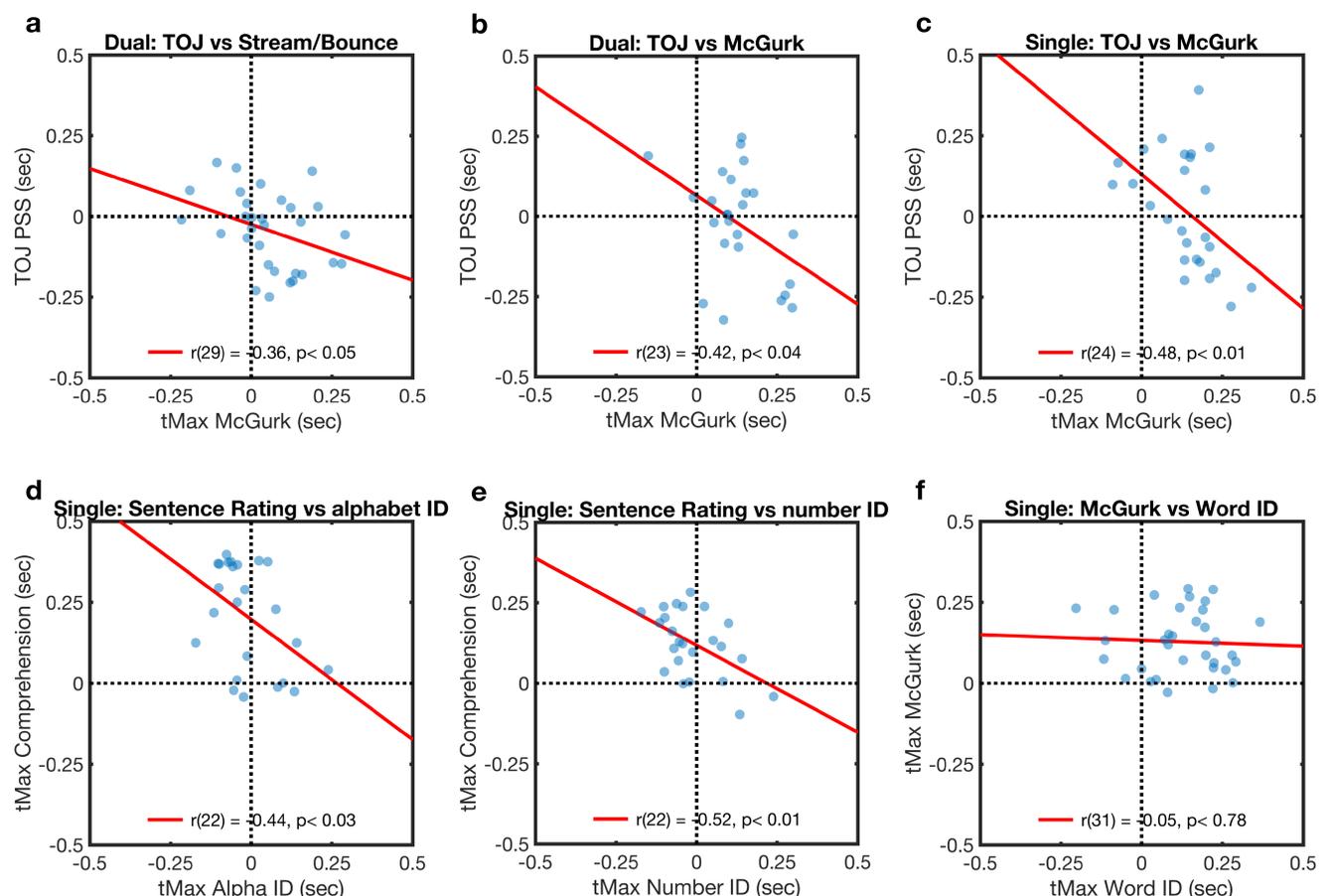
18-50, healthy with normal vision & hearing, native or fluent English; different groups tested in different tasks.

### Significant negative correlations

- Dual: TOJ vs Stream/Bounce
- Dual: TOJ vs McGurk
- Single: TOJ vs McGurk
- Single: Sentence comprehension rating vs alphabet ID
- Single: Sentence comprehension rating vs number ID

### Not significant

- Single: Word ID vs McGurk
  - Word vs syllable; congruent vs incongruent modalities



## Implications

- ve correlation: generalises across tasks and speech stimuli of varying complexity; also non-speech
- not an response bias dual task
- traits persist across testing sessions
- ve correlation abolished only for word ID vs McGurk:
  - multiple vs single syllables?
- Supports Temporal Renormalisation

## Temporal Renormalisation theory

- Different neural sub-networks for different tasks, e.g. McGurk vs TOJ
- Each sub-networks is subject to different audiovisual asynchronies
- Event timing in each sub-network is perceived *relative to* the distribution of asynchronies registered across the network.

### New constraint

- To obtain -ve correlation, stimuli presented on different sessions should have *comparable temporal structure*. They may then recreate a similar distribution of event timings.

