

# Illusory Sense of Agency in Auditory Processing: EEG Correlates of Predictions, Errors and Illusions

Scan this for references!



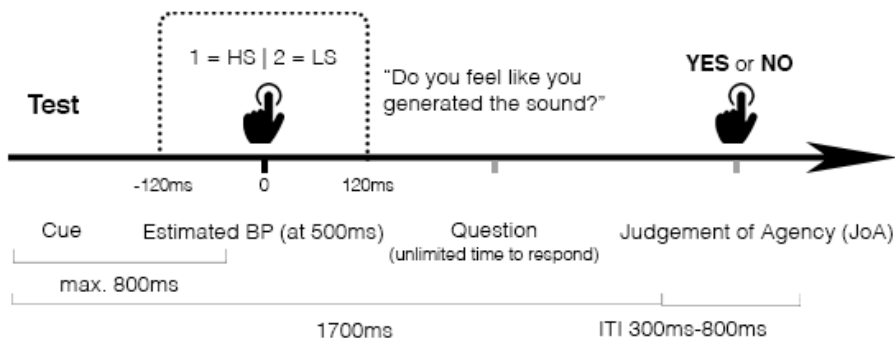
## Background

### Sense of Agency – Sense of Self

- Study of Sense of Agency connected to larger study of how the brain processes **self-generated** stimuli as opposed to **externally generated** stimuli (Timm et al., 2016)
- Two-stage model (based on Synofzik et al., 2008):
  - I. Feeling of Agency: Predictive mechanisms give rise to an intuitive, implicit Sense of Agency
  - II. Judgement of Agency: Reflective, inferential judgment is formed, taking into account all available sources of information
- To distinguish between self- and externally generated stimuli is crucial for accurate sense of self and environment, can lead to psychosis when disrupted (Daprati et al., 1997)

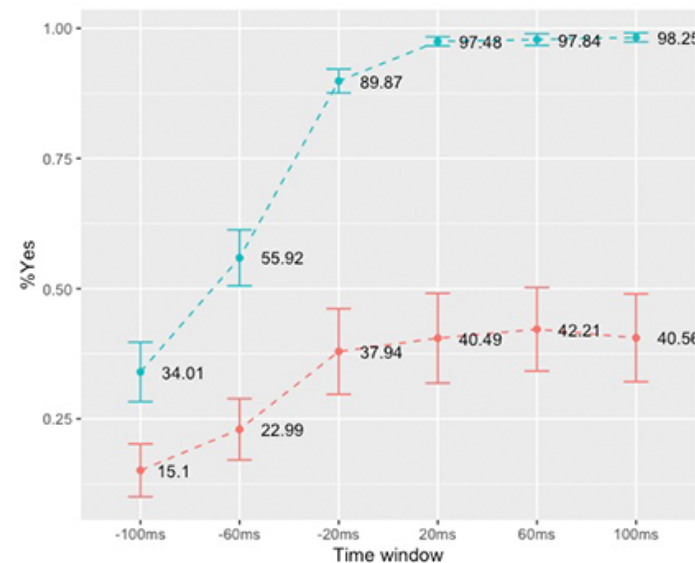
### The Illusion: a sound occurs before a button press – but you still think you created it!

- Sense of Agency: The feeling that oneself is the agent/cause of a sensory event (Gallagher, 2000)
- Illusion of Agency: We manipulate the timing of sound stimuli in relation to button presses, so that sounds occur *very slightly* before button presses – participants still think they created the sounds!



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## Findings



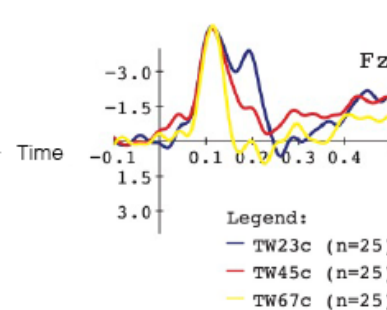
### Congruency and timing affect post-hoc judgements

- Timing has a strong influence on agency judgements, but when sounds occur up to 20ms **before** the button press, they may still be perceived as self-generated!
- Congruency affects agency judgements strongly, especially positive and ambiguous time windows

Congruency  
 — congruent  
 — incongruent

### N200 correlates with timing

- N200 amplitude varies as a function of timing between sound and button press
- Early sounds cause a strong N200, late sounds almost none



Topographical maps at 200ms after sound

