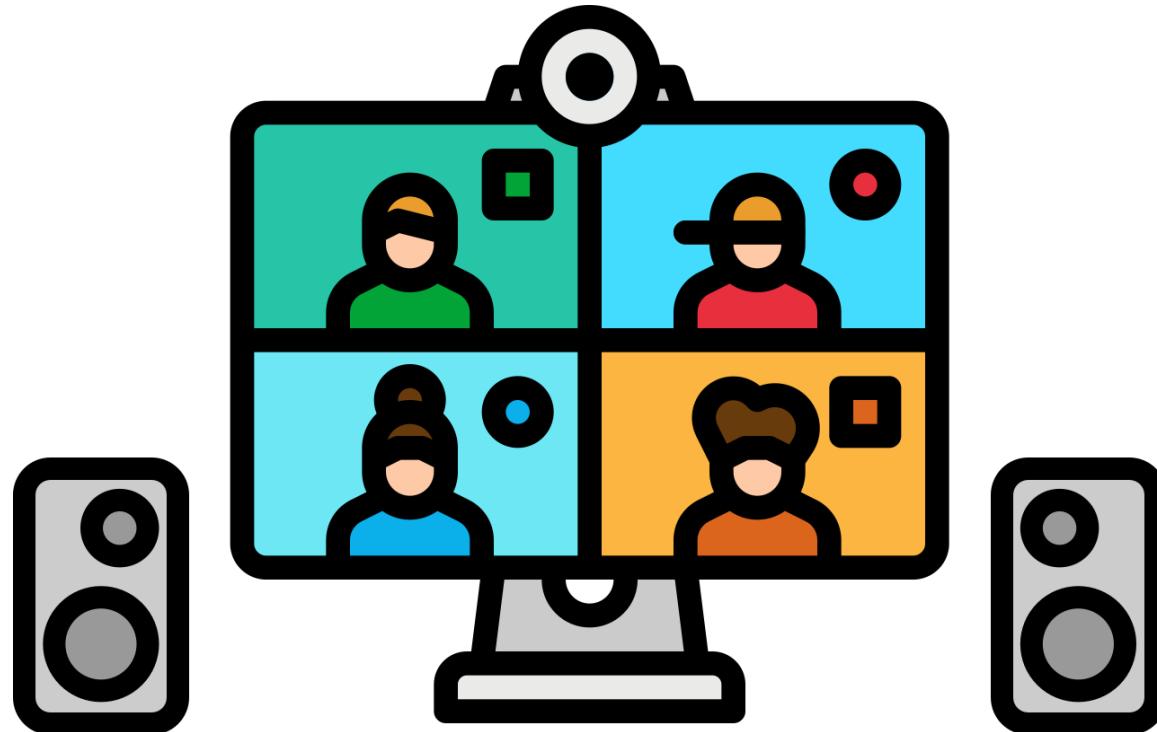


# Cognitive load increases multisensory integration



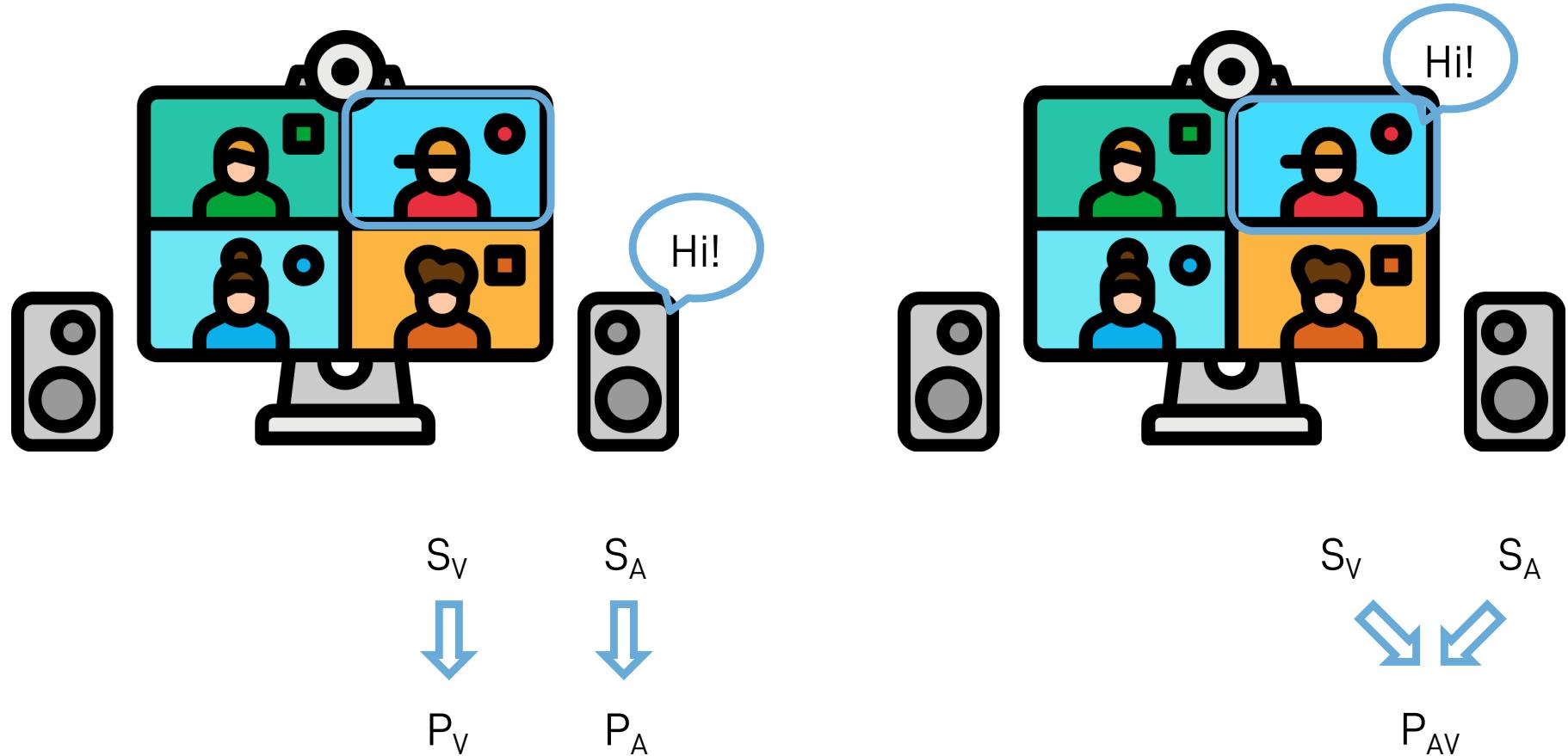
Dr. Julian Keil

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<https://tinyurl.com/Keil-TeaP-2021>

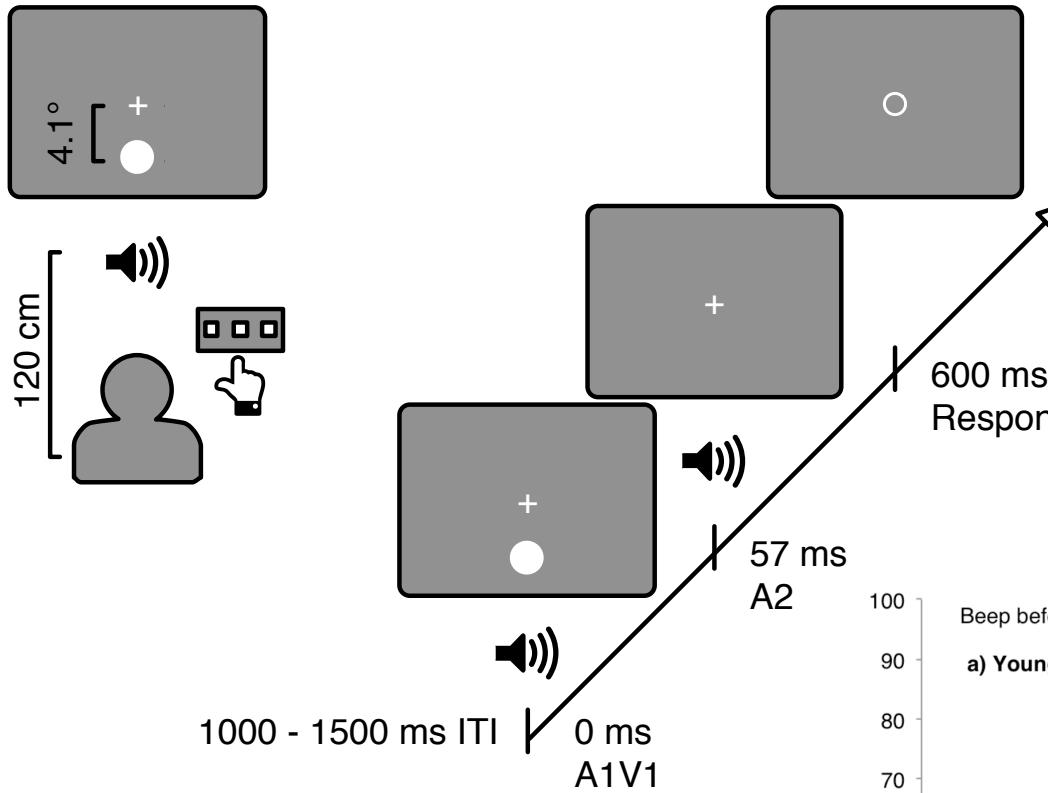
# To integrate or not to integrate?



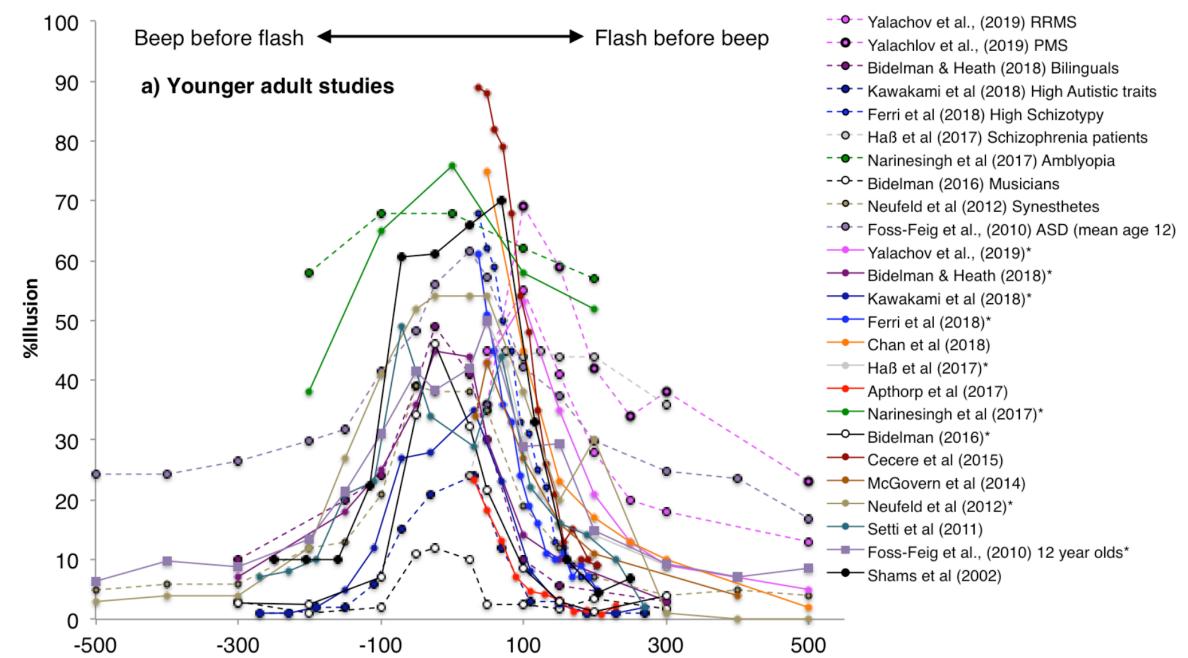
Hirst et al., 2020

Bizley et al., 2016

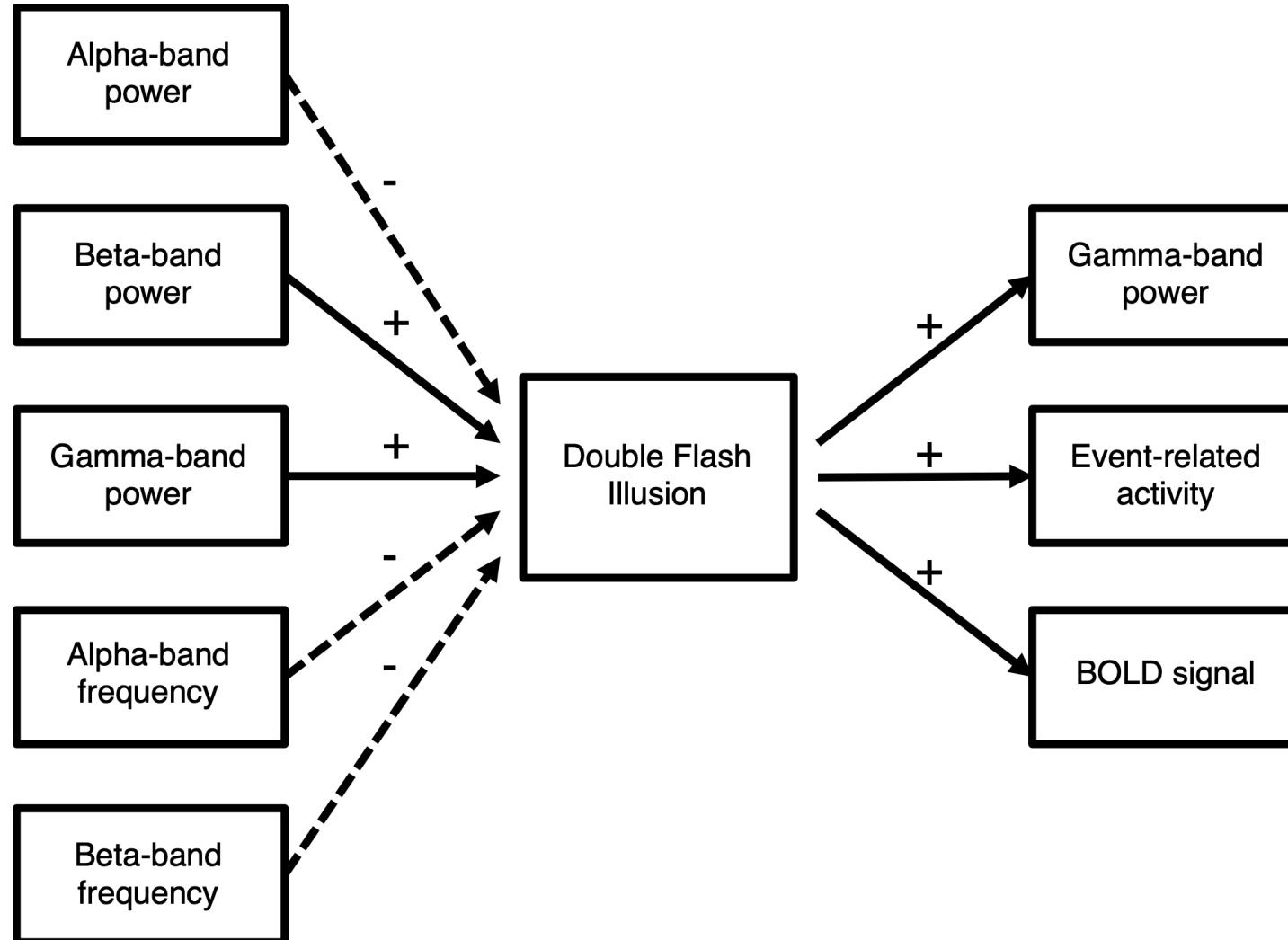
# Sound Induced Flash Illusion



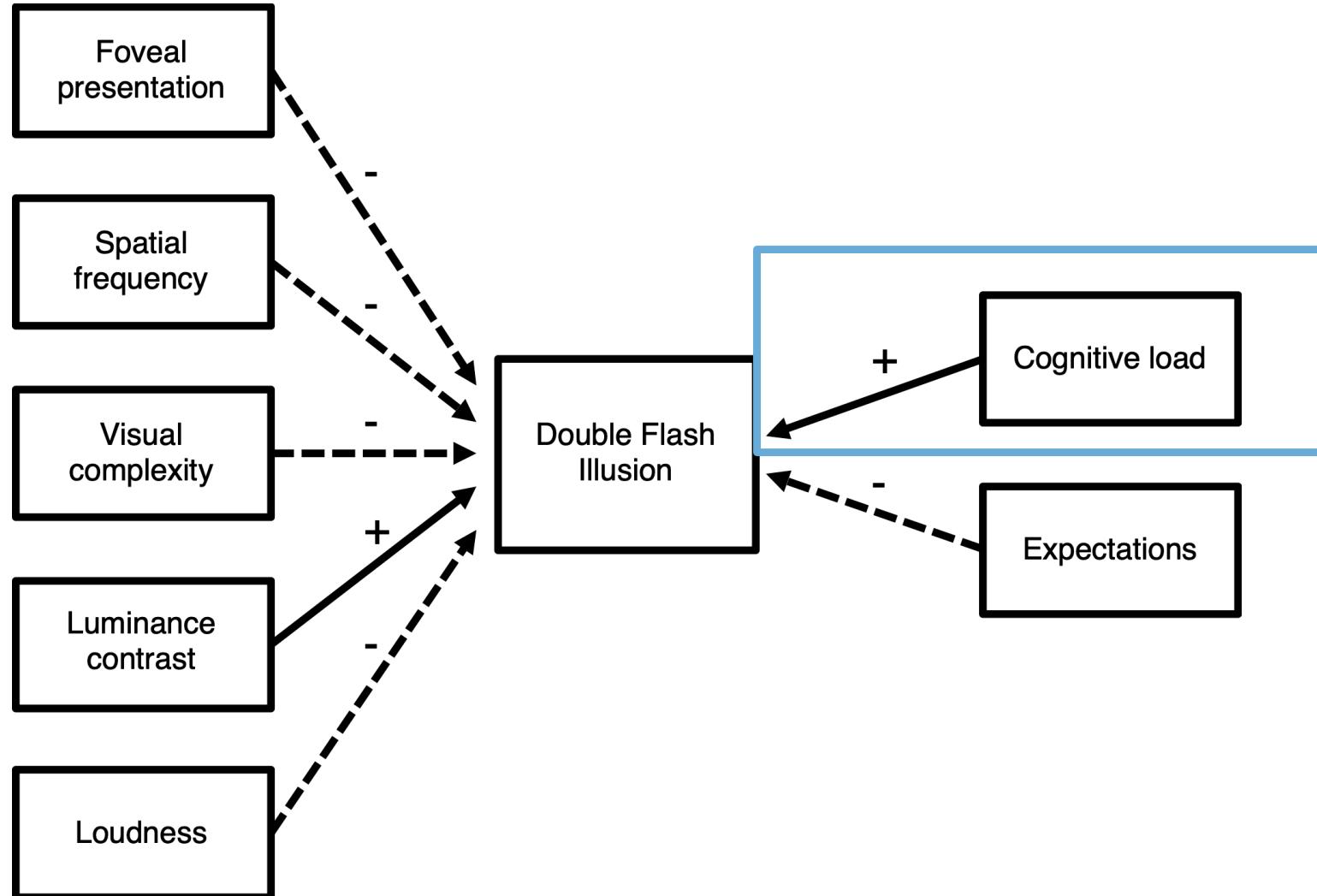
Hirst et al., 2020  
Keil, 2020



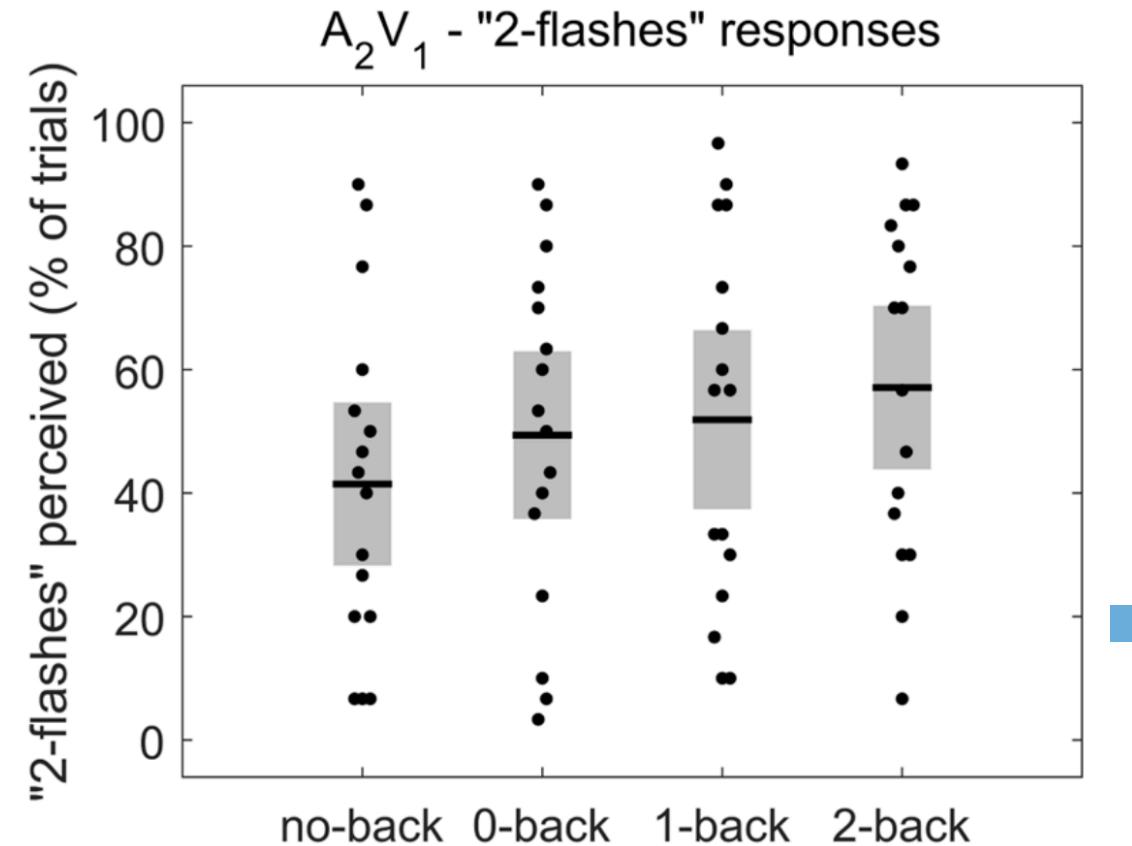
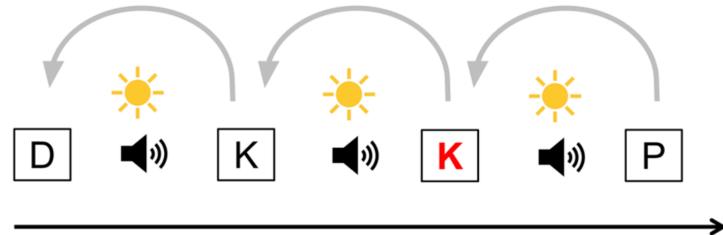
# Sound Induced Flash Illusion



# Sound Induced Flash Illusion



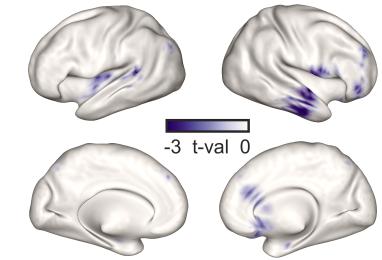
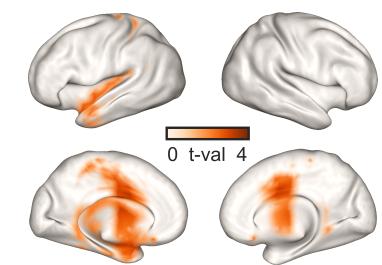
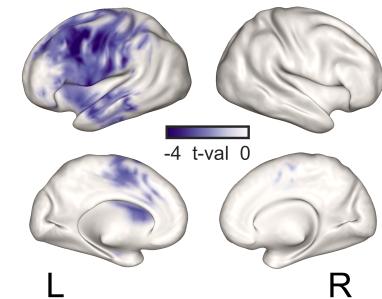
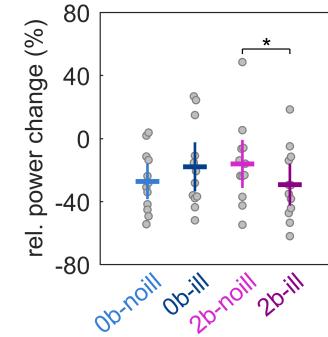
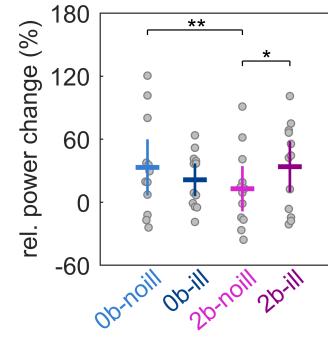
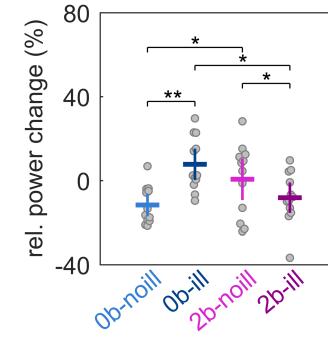
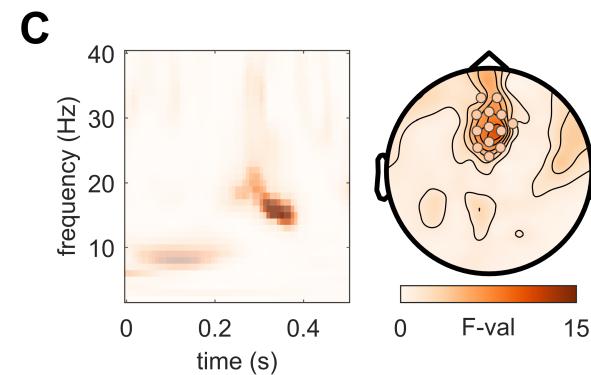
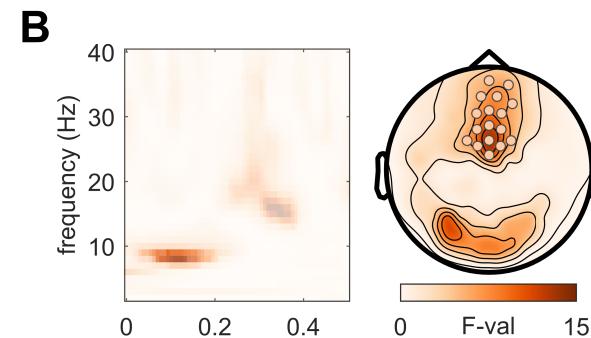
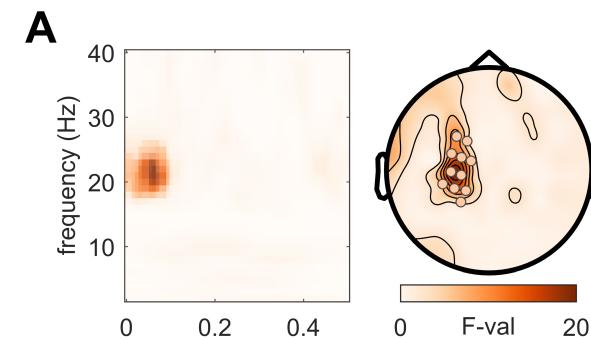
# Experiment 1: Influence of Cognitive Load



- N-back task increased cognitive load and depletes resources
- Cognitive load increases the SIFI

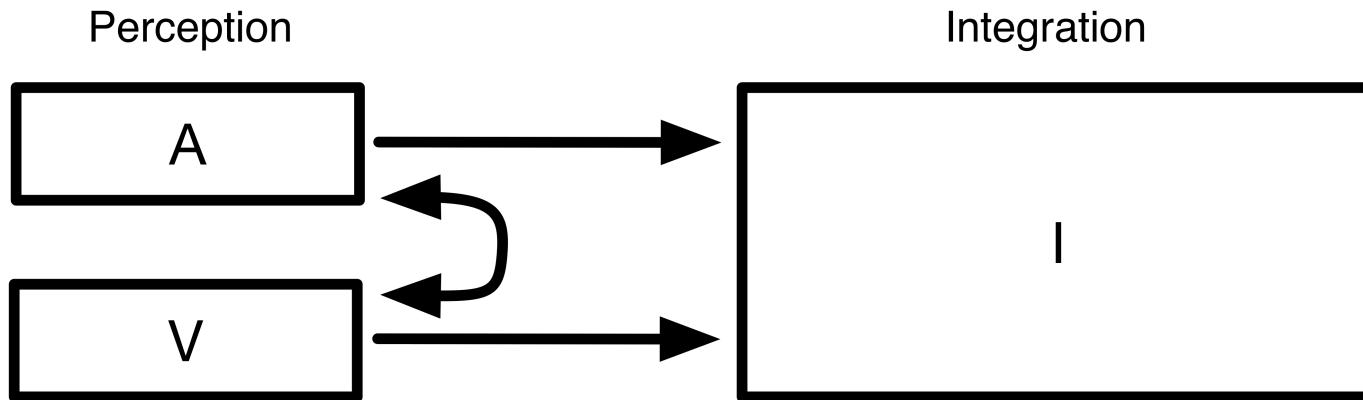
## Experiment 2: Neural Mechanisms

- Replication:  
Cognitive  
load  
increases  
the SIFI
- Theta and  
beta power  
reflect  
interaction  
between  
load and  
perception



# Multisensory Integration involves multiple processing stages: Mismatch detection and conflict resolution

Crossmodal interactions in the SIFI are sensitive to the cortical state and to manipulation of the available cognitive resources



- Local cortical activity reflects cortical excitability and influences initial processing
- Bottom-up stimulus processing influences signal propagation across stages
- Depleting cognitive resources influences integration, but not initial processing
- Depleted cognitive resources requires increased engagement of top-down processing to resolve conflict or competition

# Thank you!



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Prof. Dr. Daniel Senkowski,  
Dr. James Moran, Georgios Michail



KE1828/2-1 (2014-2016)  
KE1828/4-1 (2016-2021)  
KE1828/4-2 (?)

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