

Eye measures reveal unconscious and conscious processing in healthy and impaired sensory perception

Sharif I. Kronemer, PhD, MSc
Covert Measures of Consciousness
July 2, 2026



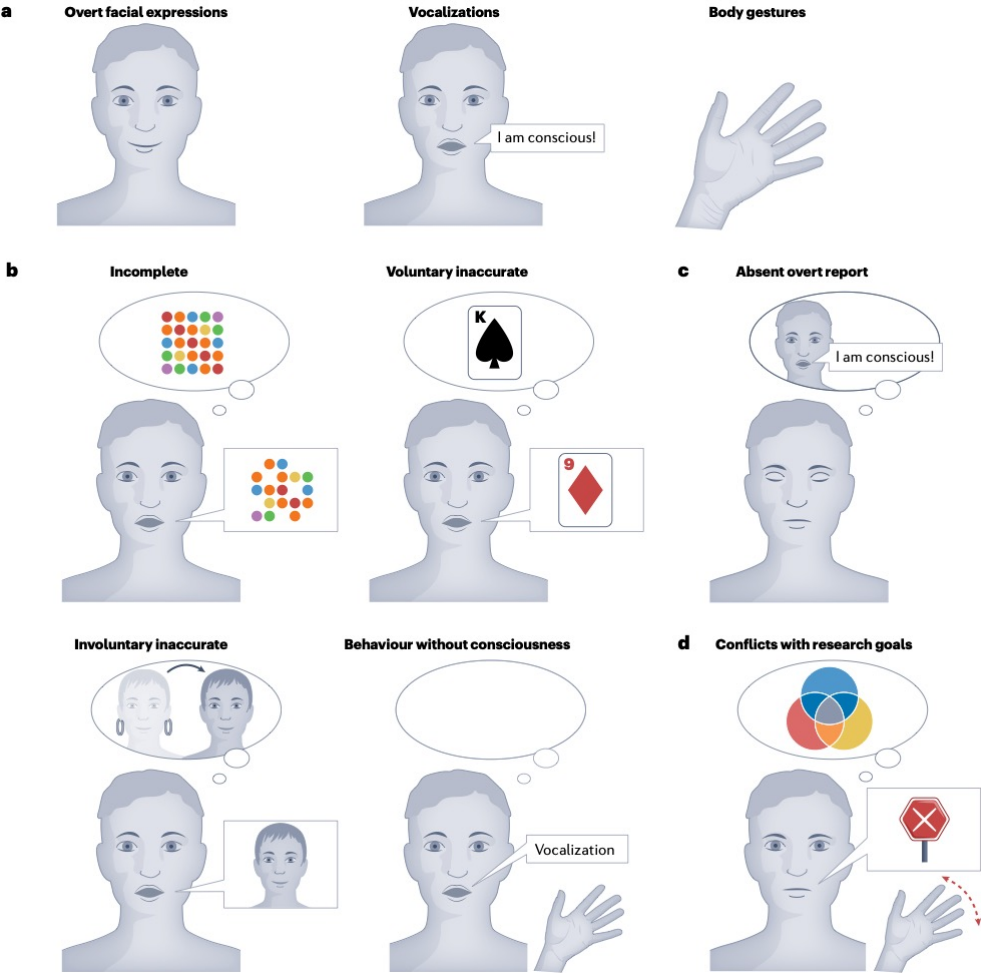
National Institute
of Mental Health



Consciousness

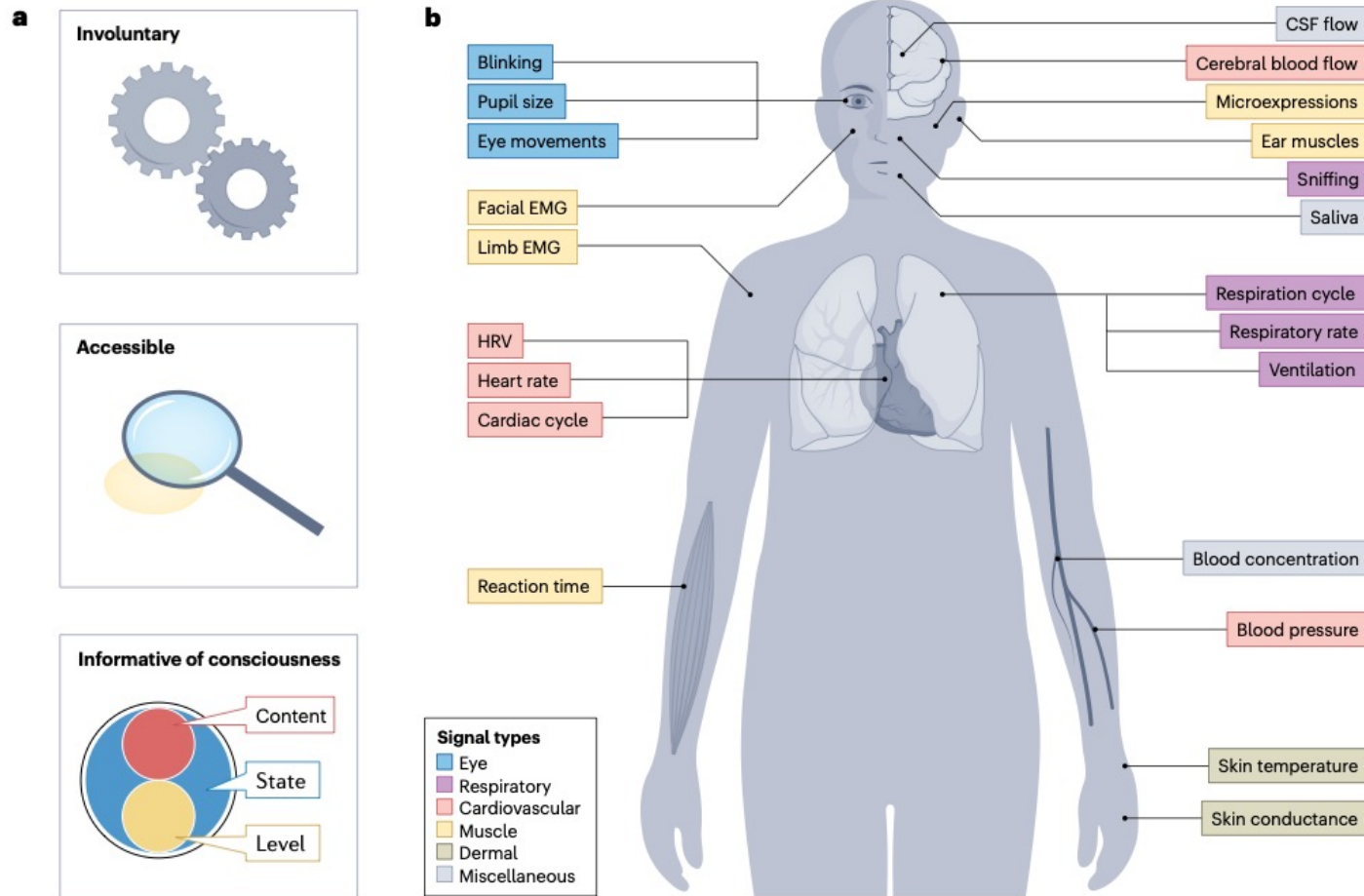
First-person, subjective (private)
experience of the world and body

Overt Report

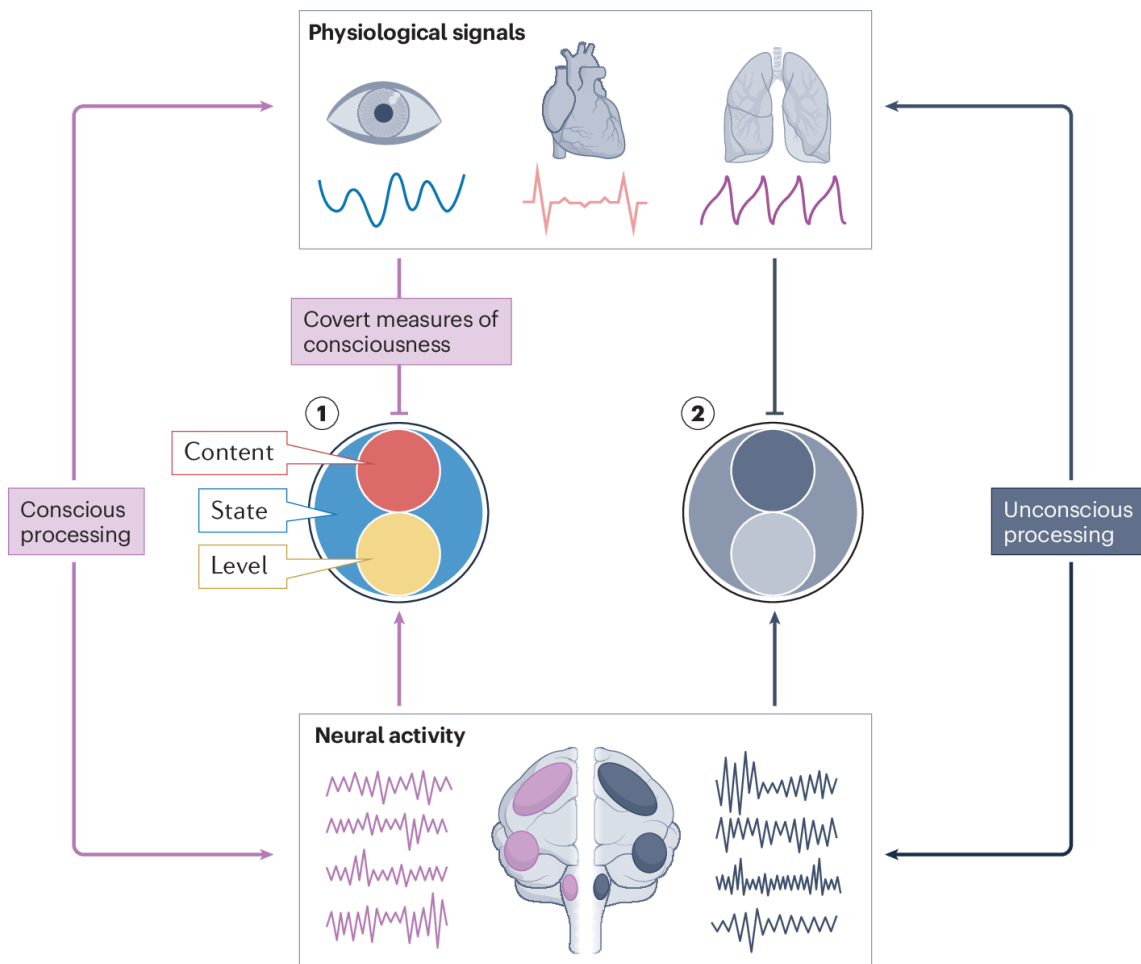


Kronemer *et al.*, *Nature Reviews Neuroscience*, 2025

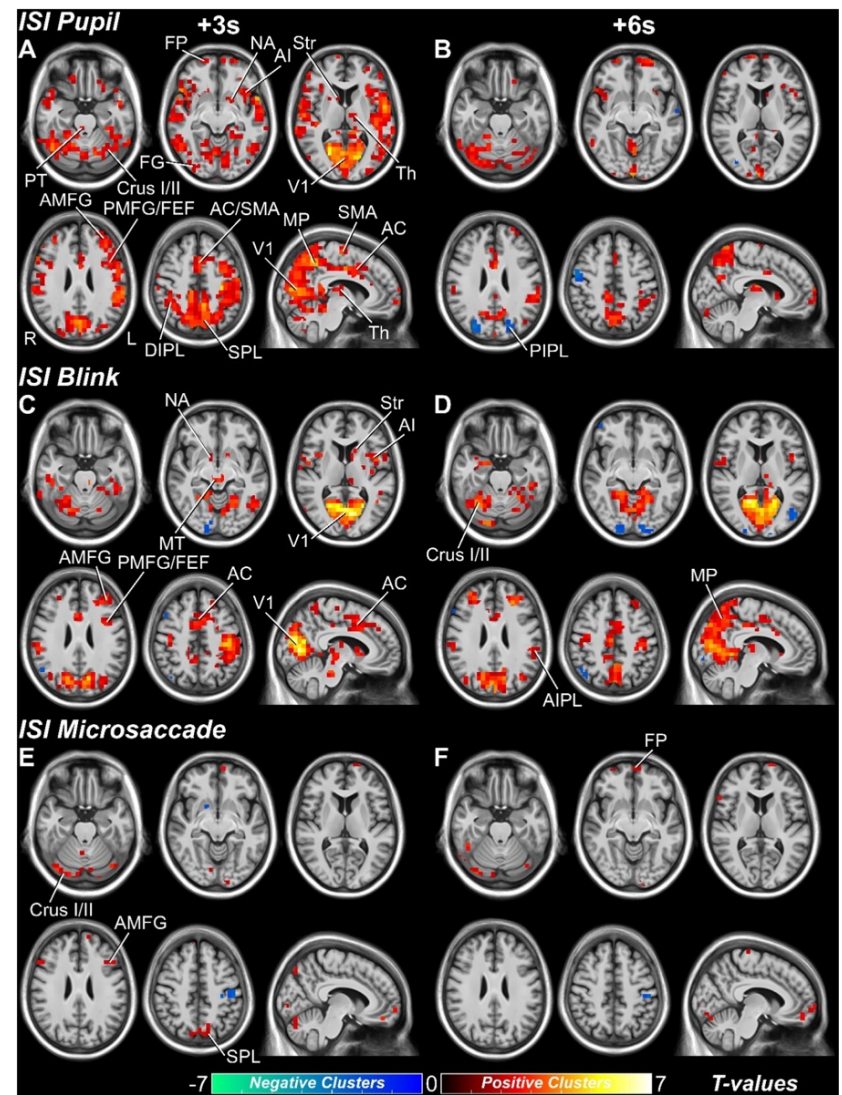
Covert measures of consciousness



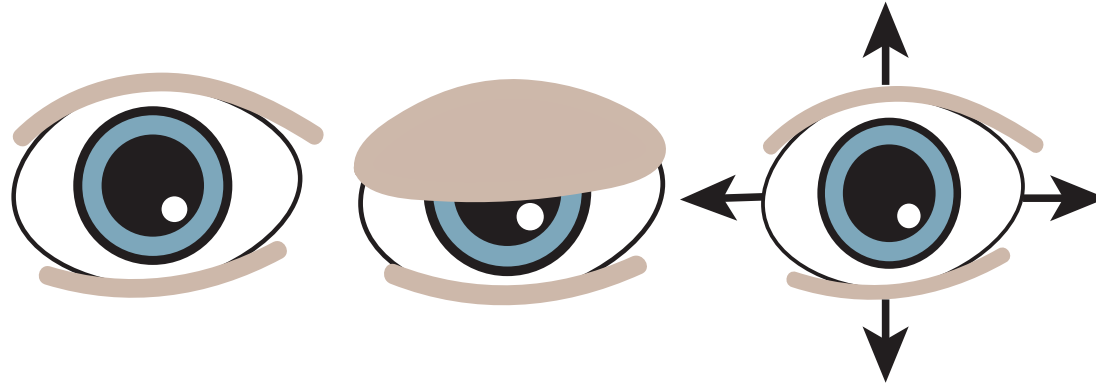
Kronemer *et al.*, *Nature Reviews Neuroscience*, 2025



Kronemer et al., *Nature Reviews Neuroscience*, 2025



Kronemer et al., *Nature Communications*, 2022



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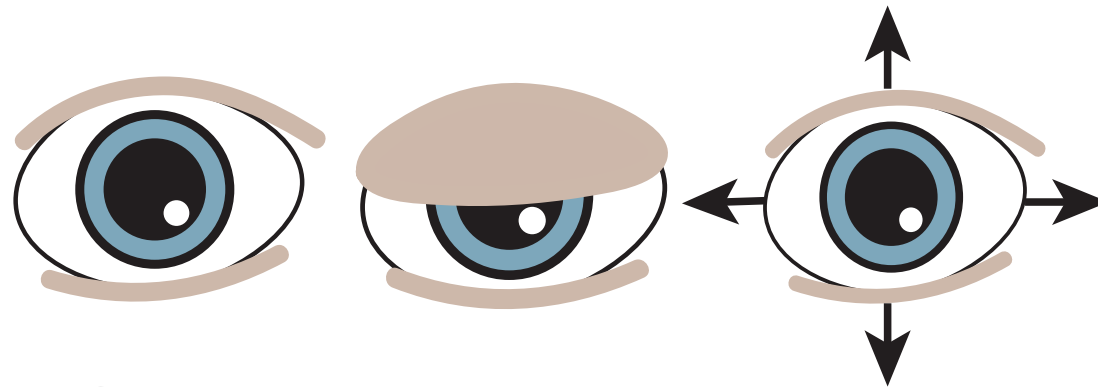
Conscious processing

- a Healthy perception
- b Impaired perception

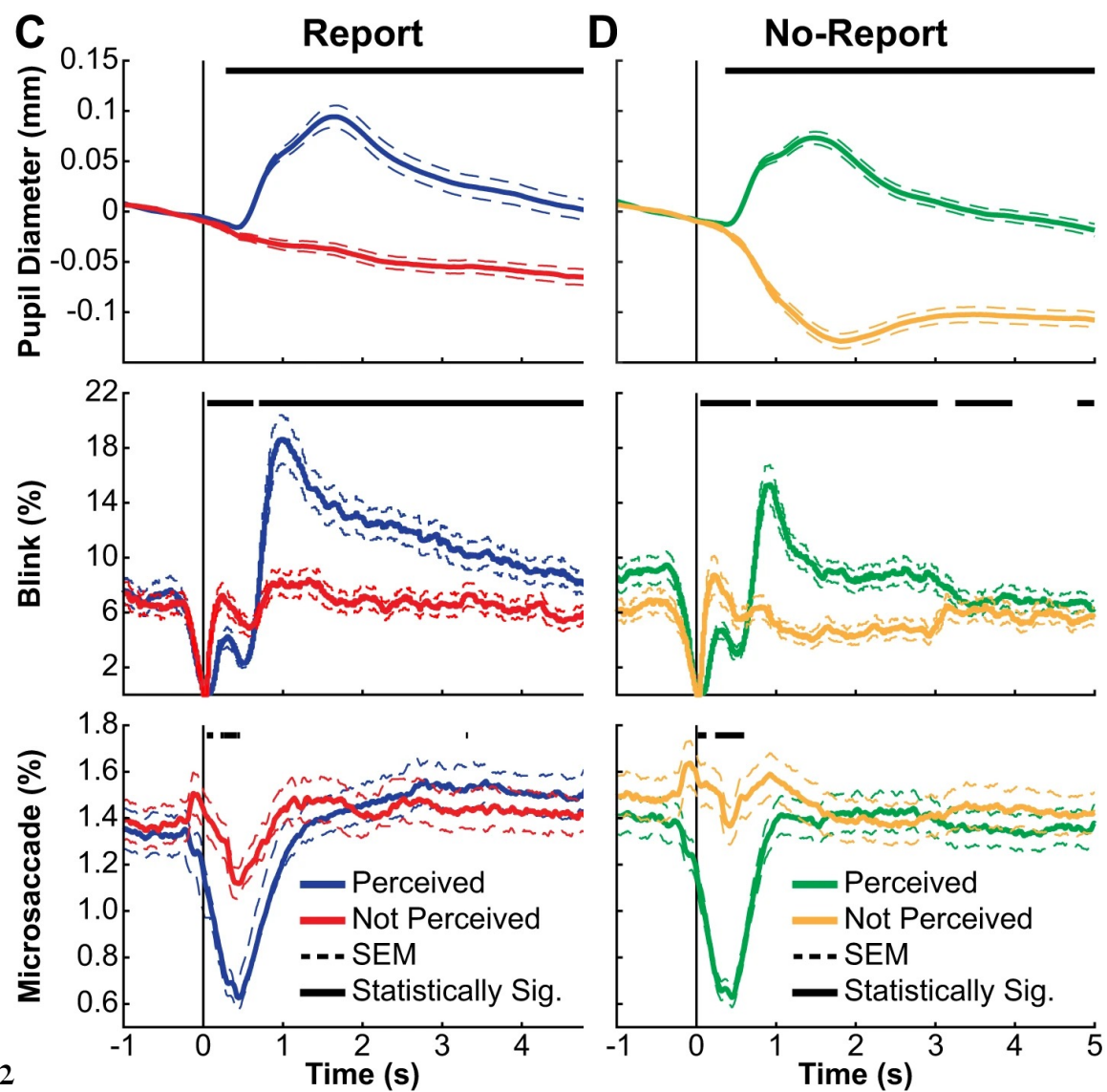
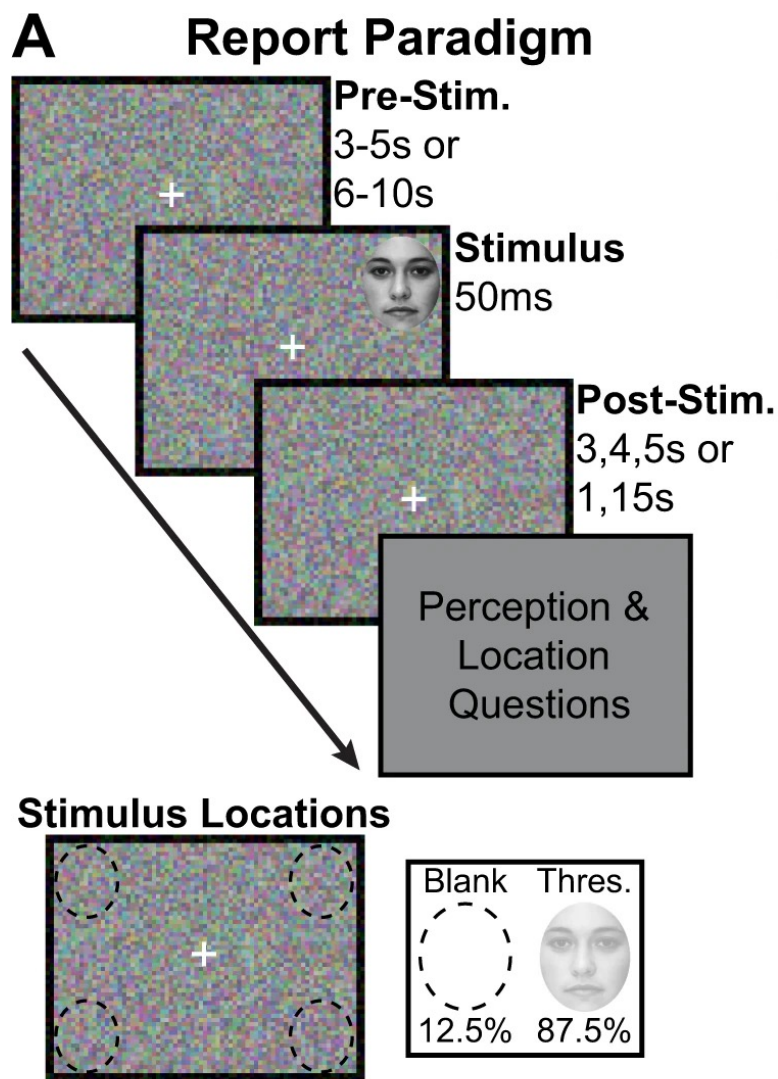
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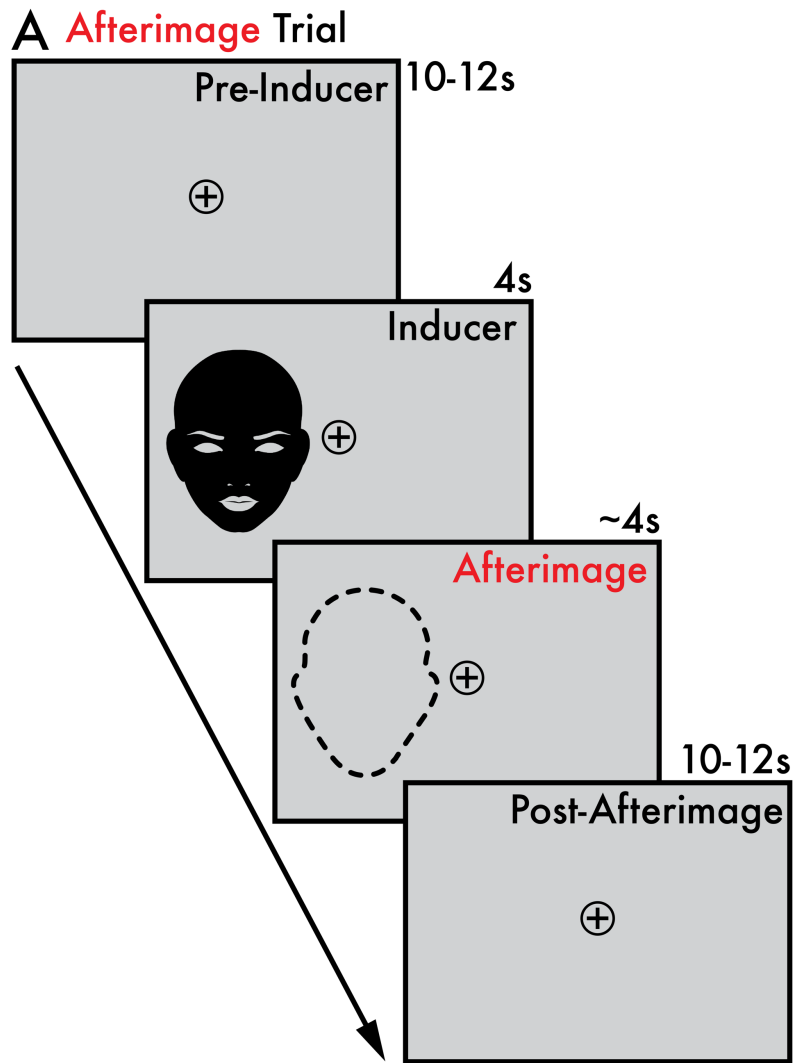
Unconscious processing

- a Healthy perception
- b Impaired perception

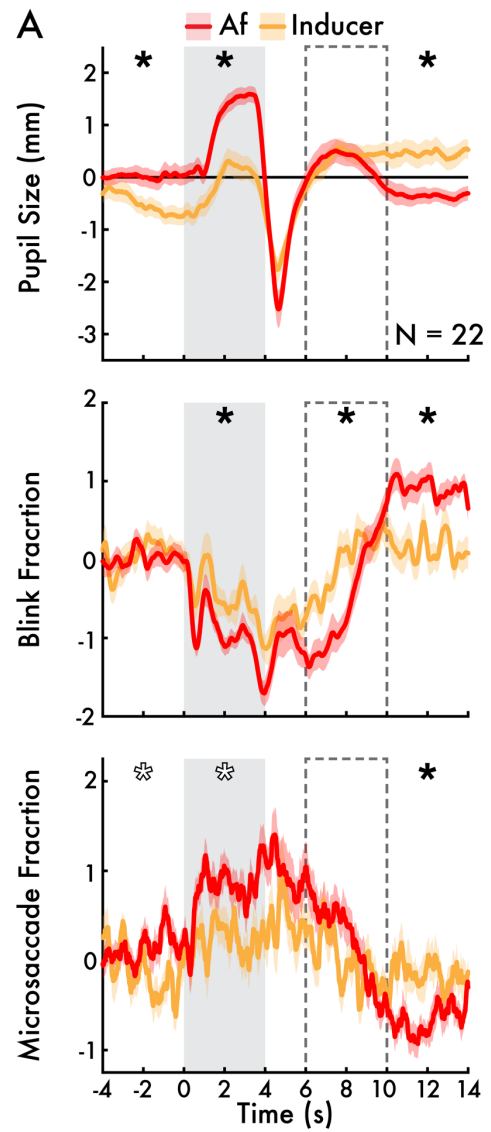


Conscious processing
Healthy perception

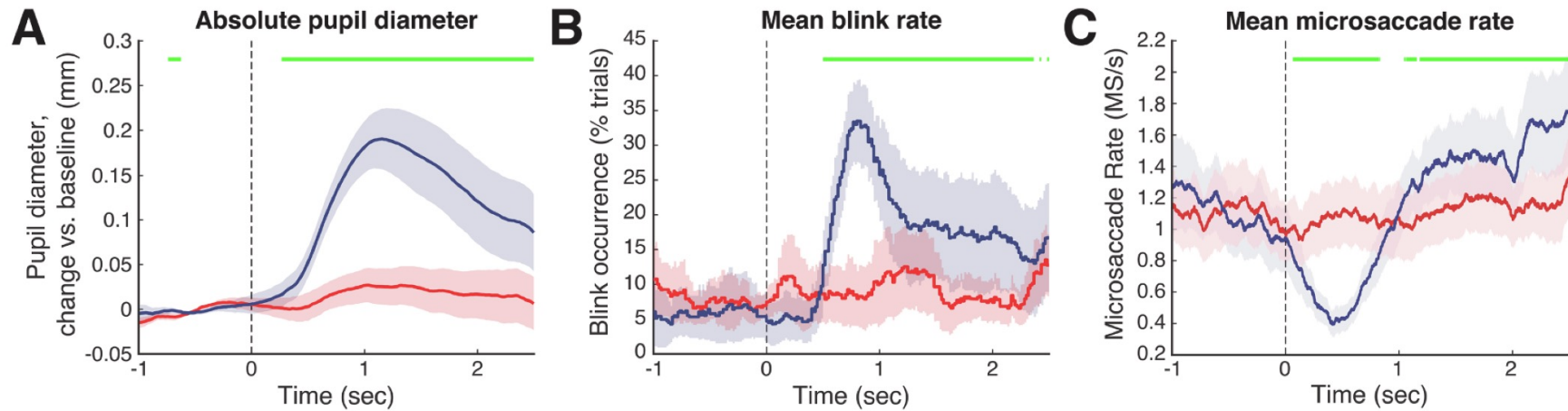




Kronemer, Akin, *et al.*, in review

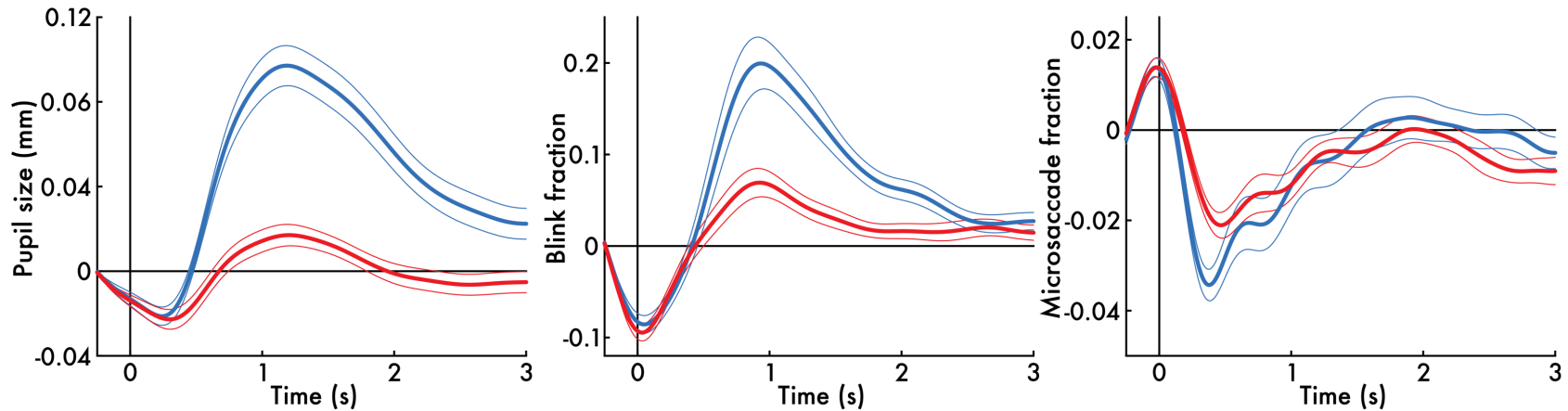


Tactile perception

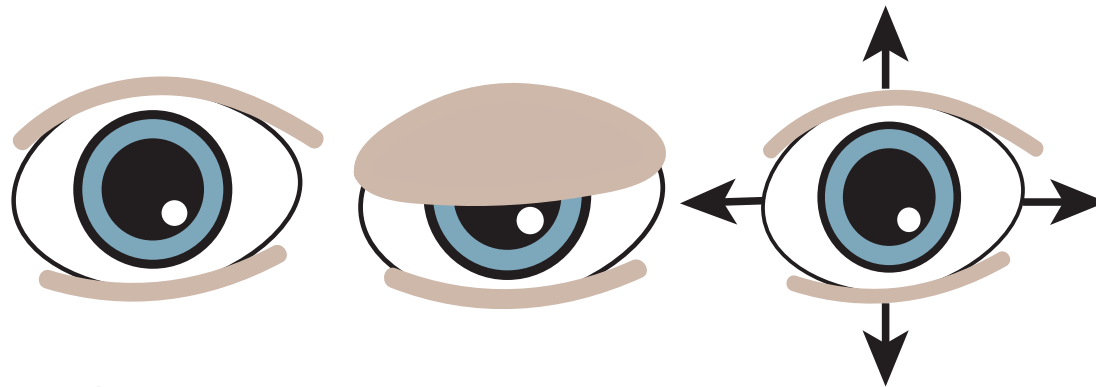


Gusso *et al.*, *Consciousness & Cognition*, 2022

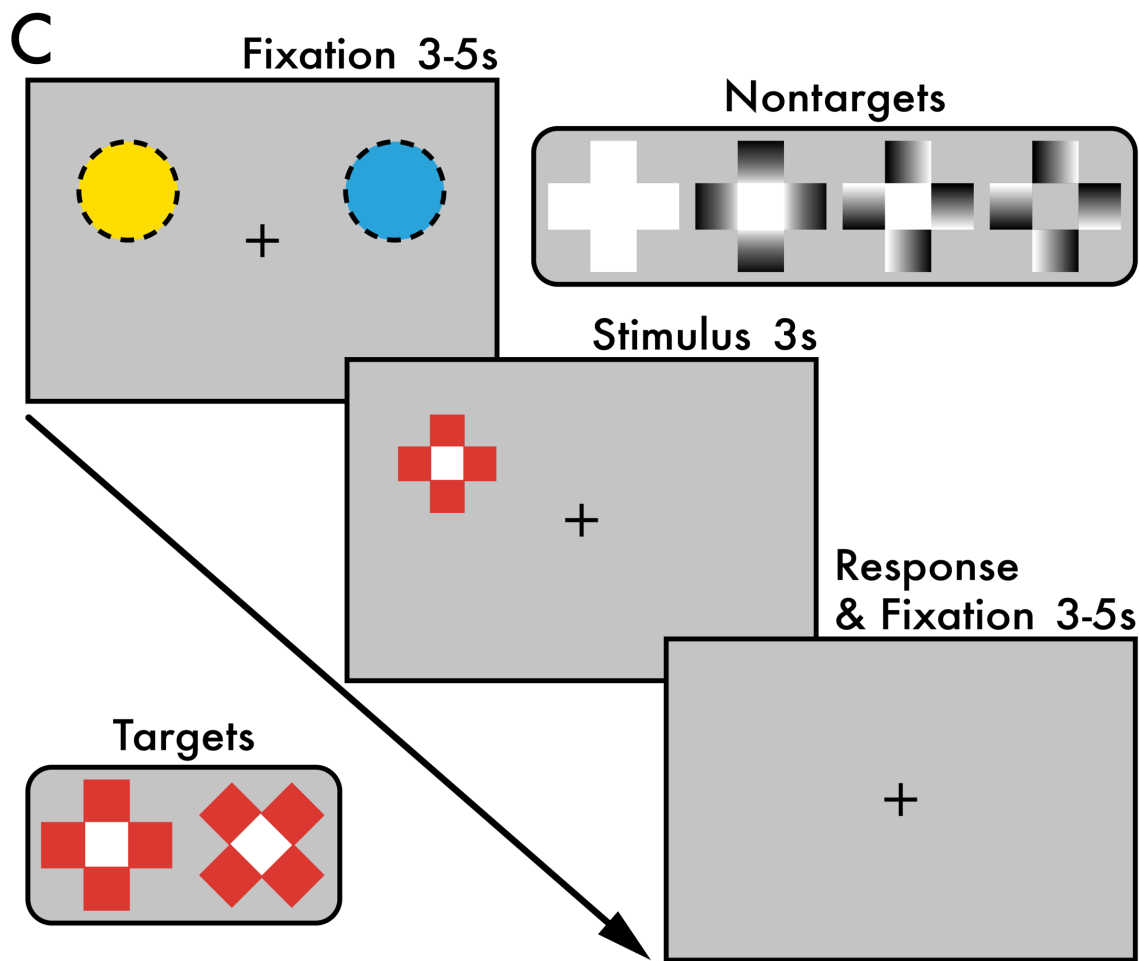
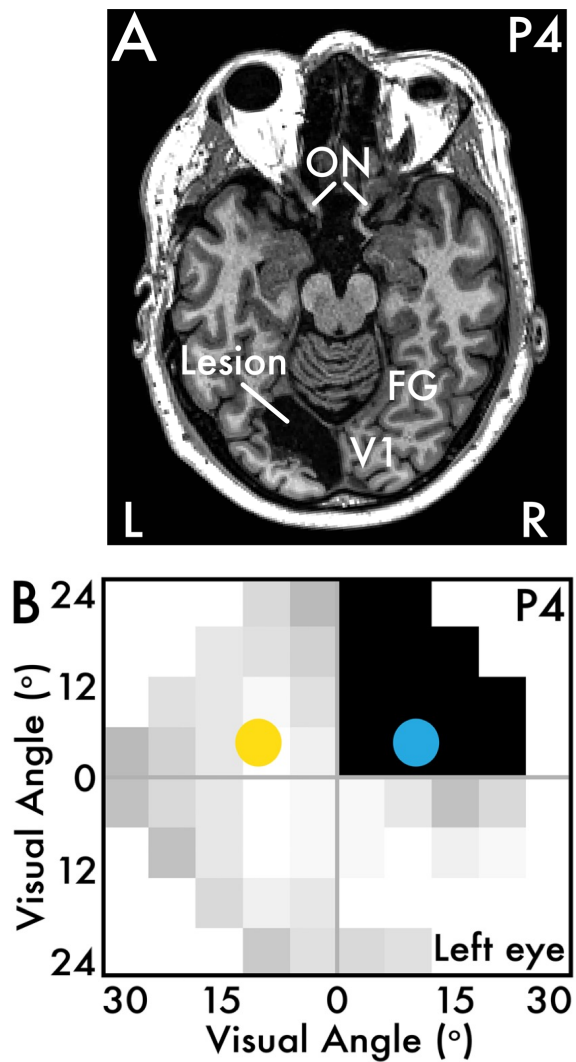
Auditory perception



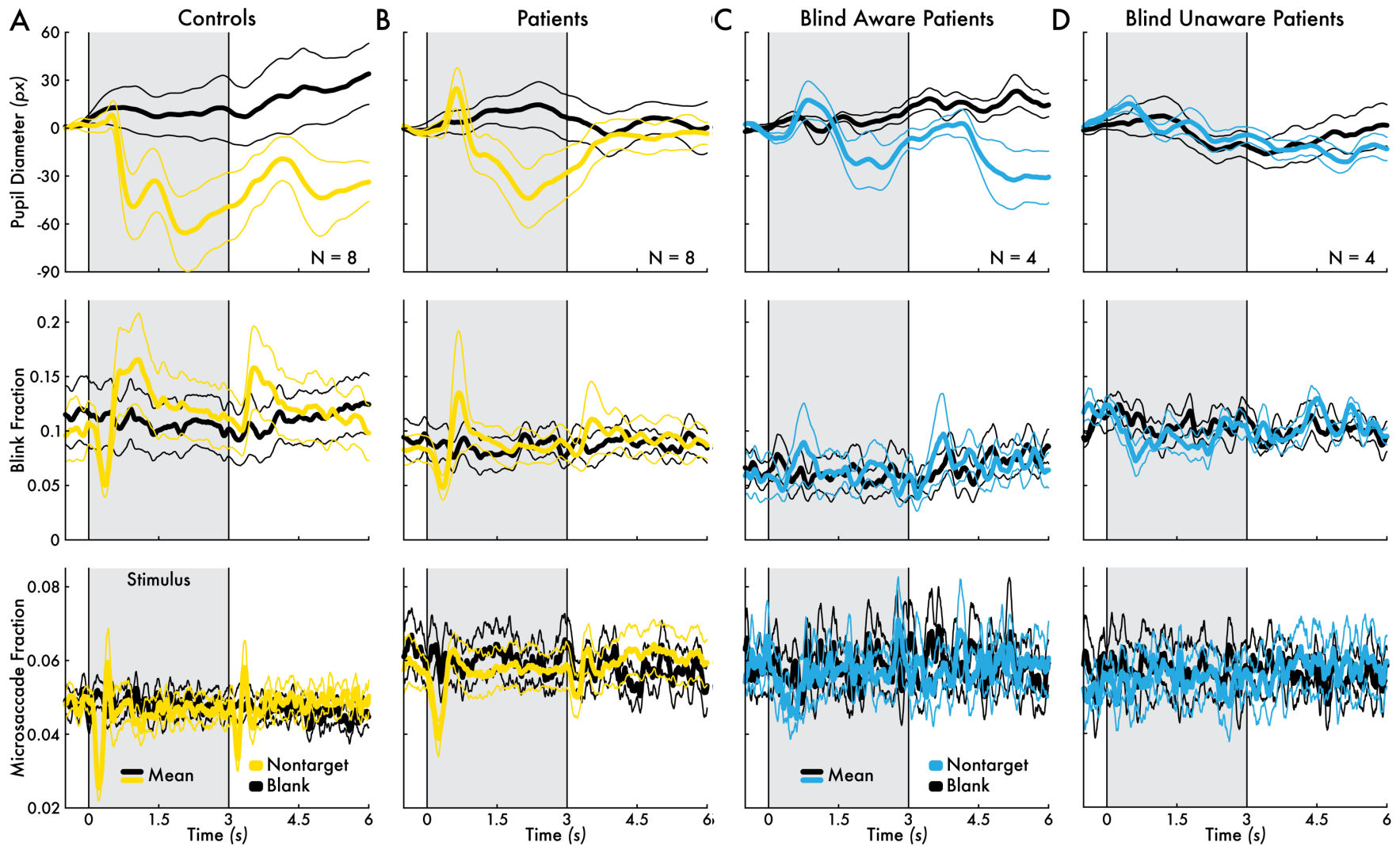
Kronemer, Suwanamalik-Murphy *et al.*, in preparation

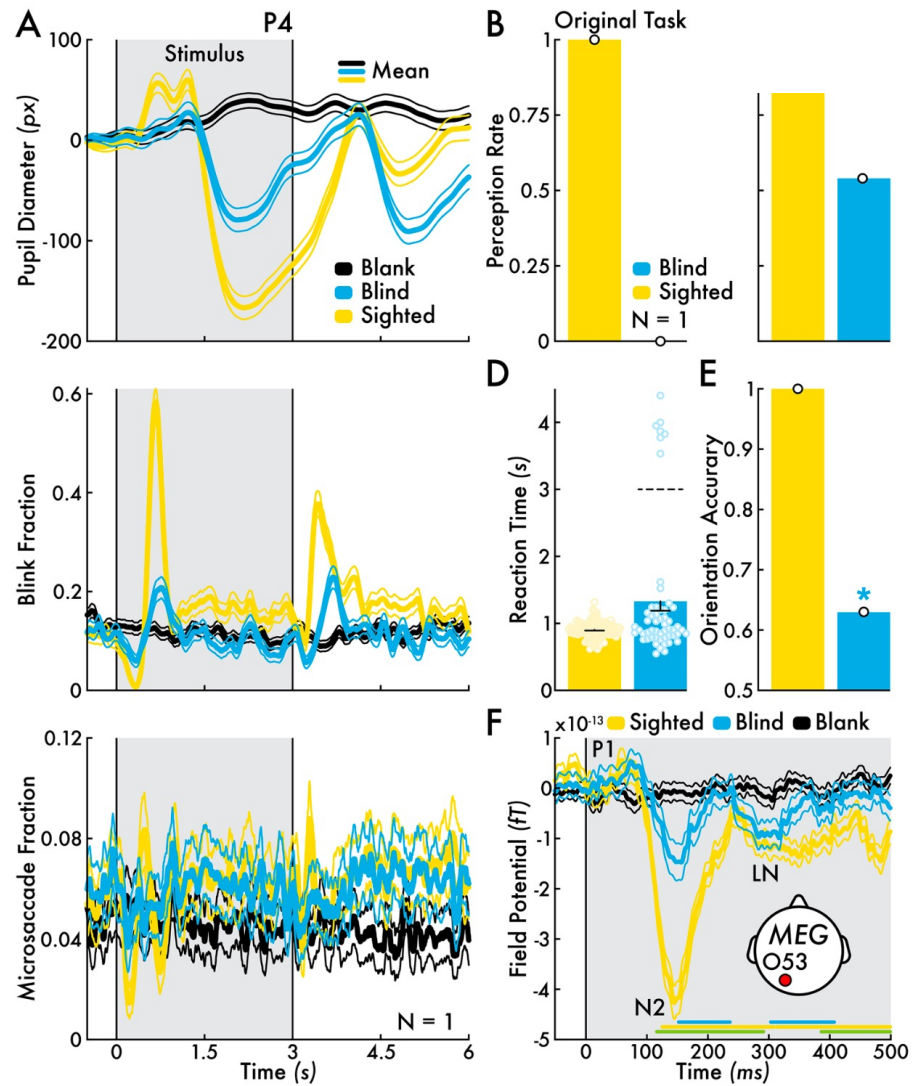


Conscious processing
Impaired perception

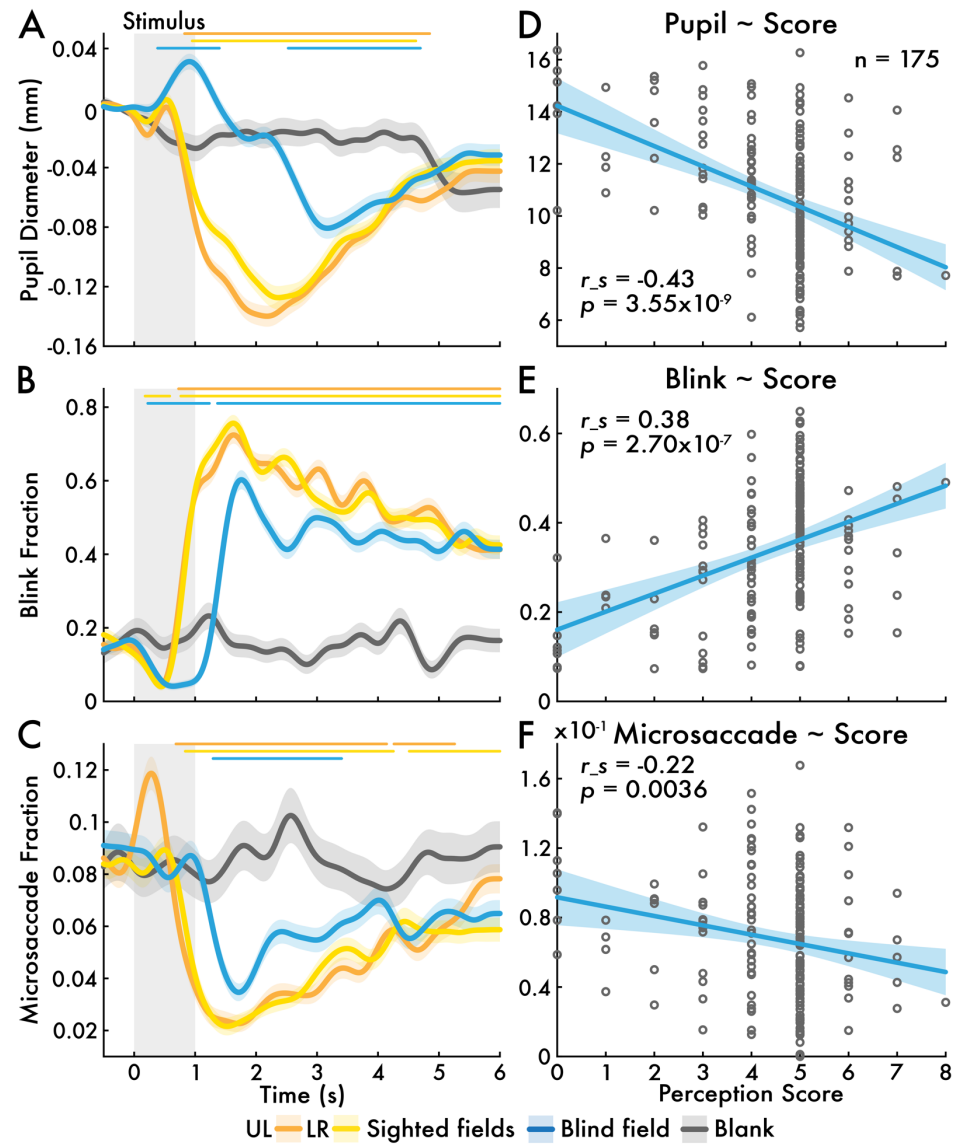
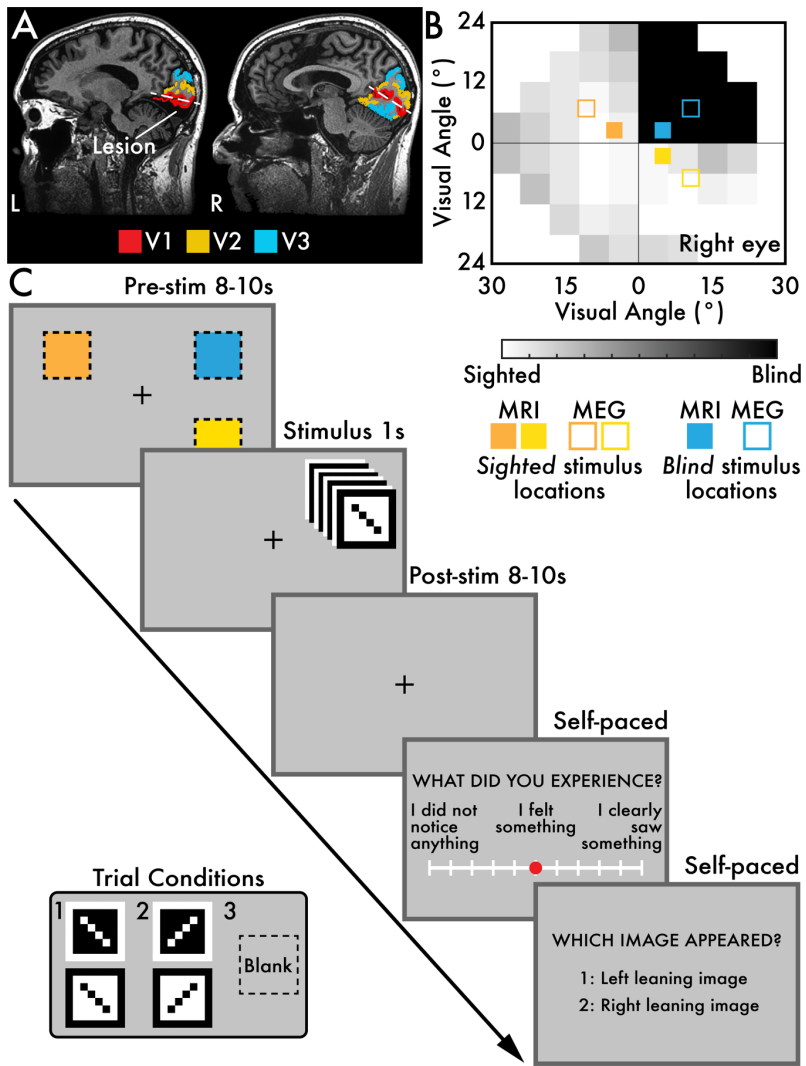


Kronemer, Gobo, *et al.*, *Communications Biology*, 2025

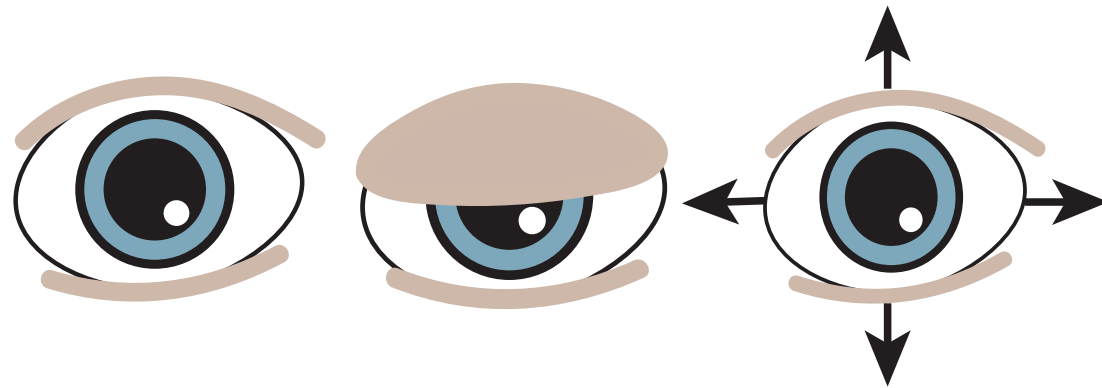




Kronemer, Gobo, *et al.*, *Communications Biology*, 2025

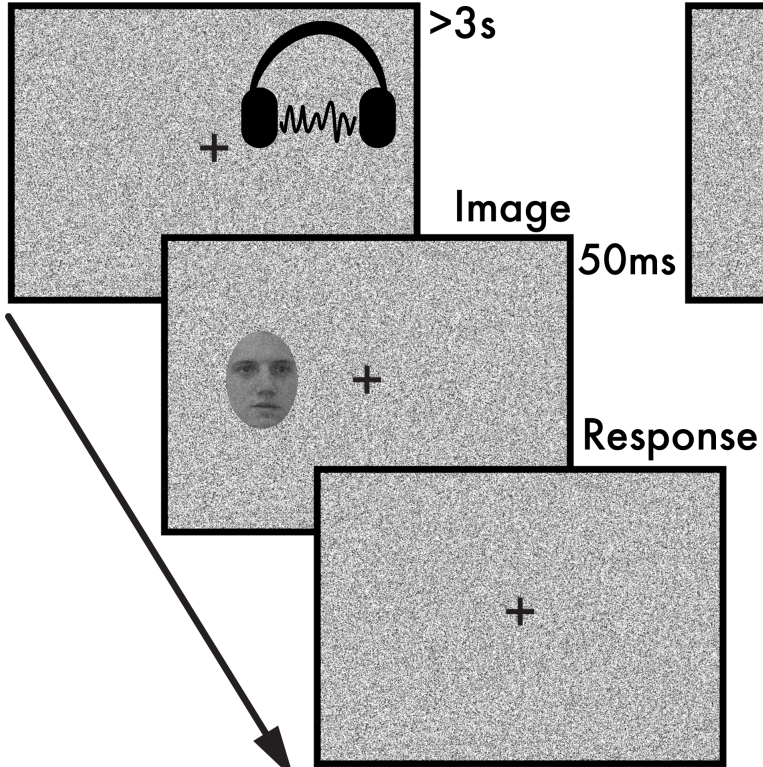


Kronemer, Levesque, *et al.*, in preparation

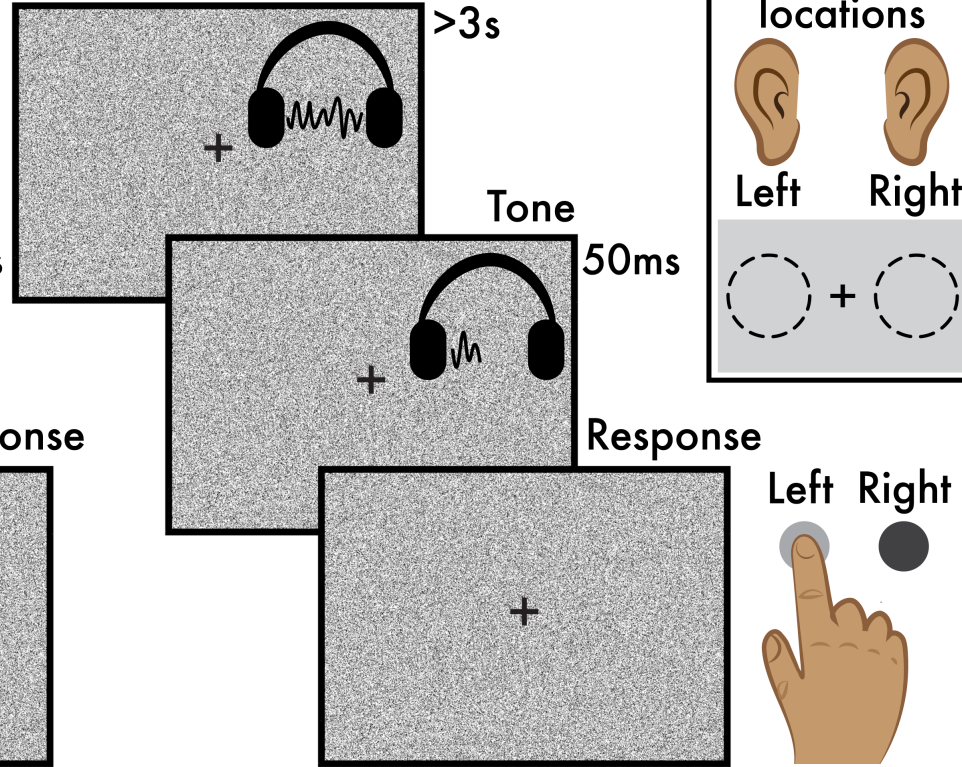


Unconscious processing
Healthy perception

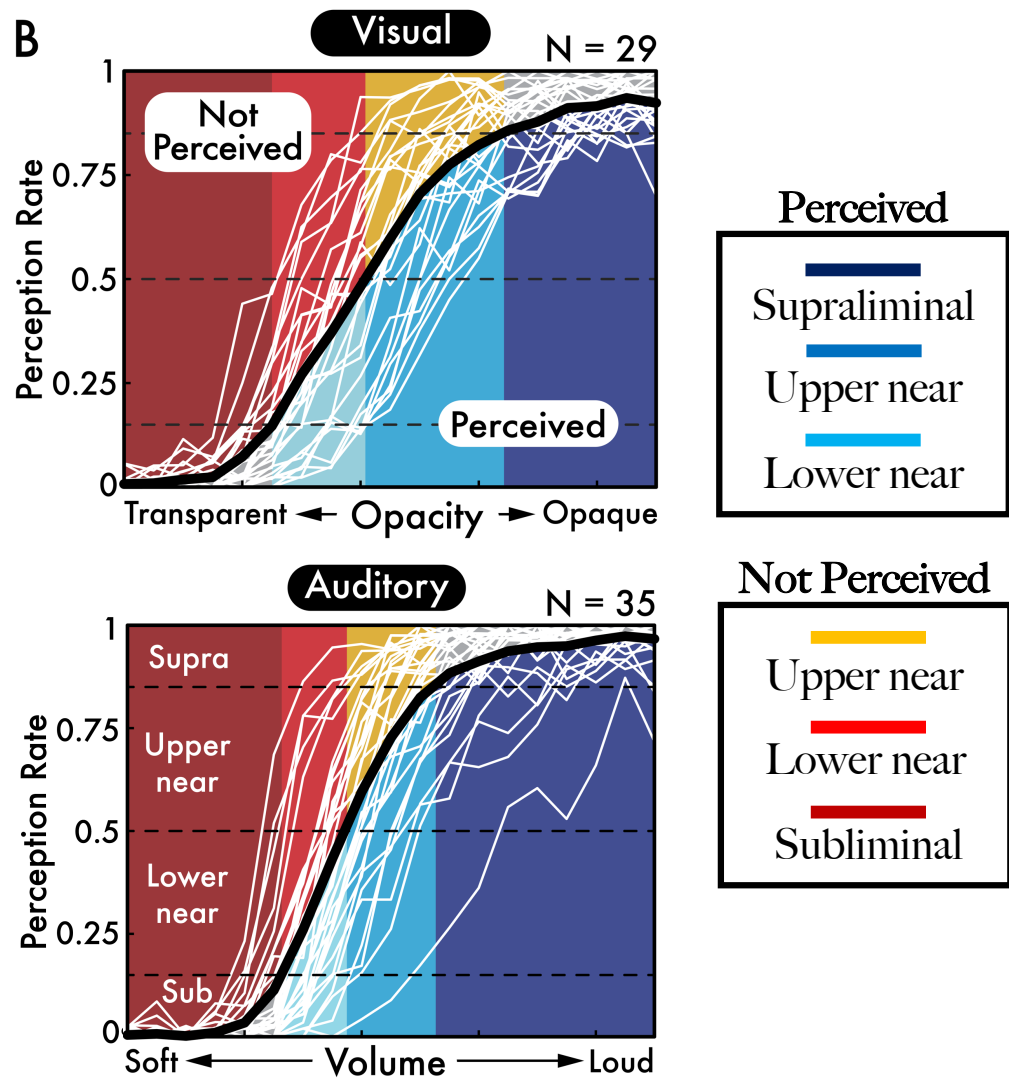
A Visual Paradigm



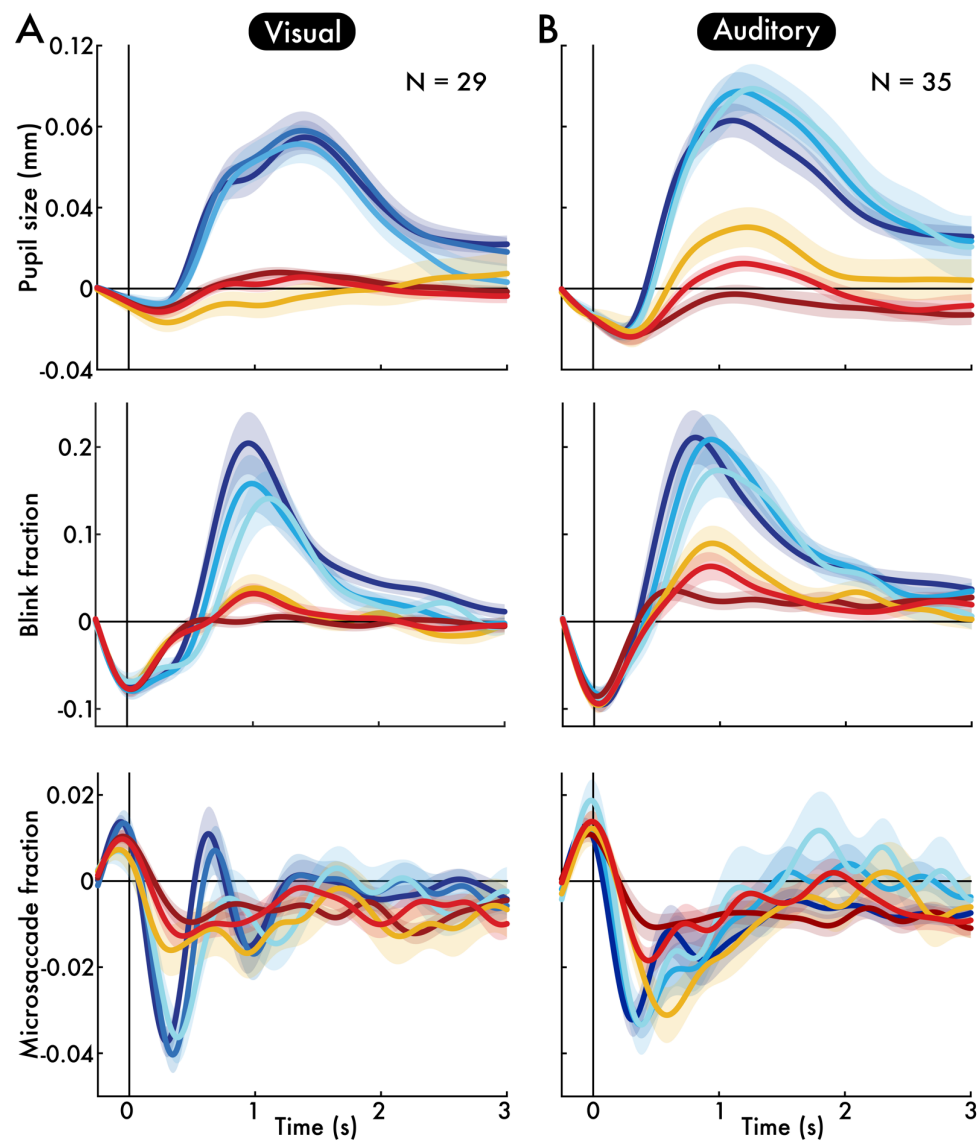
Auditory Paradigm

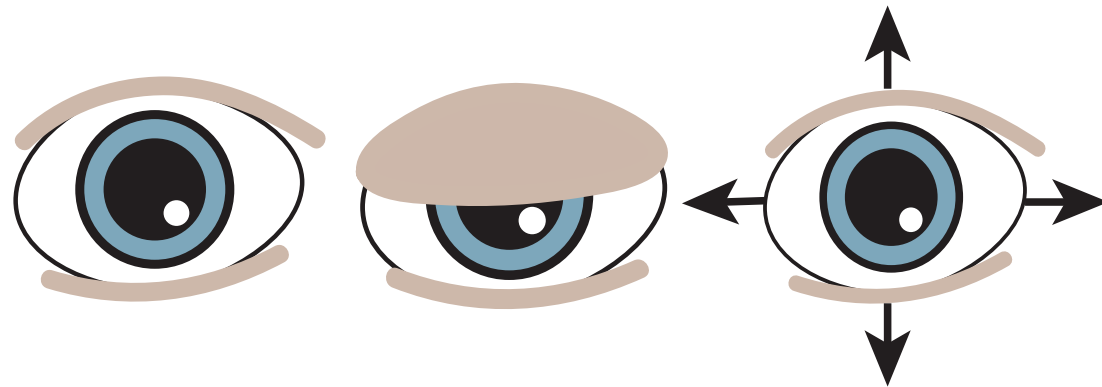


Kronemer, Suwanamalik-Murphy *et al.*, in preparation

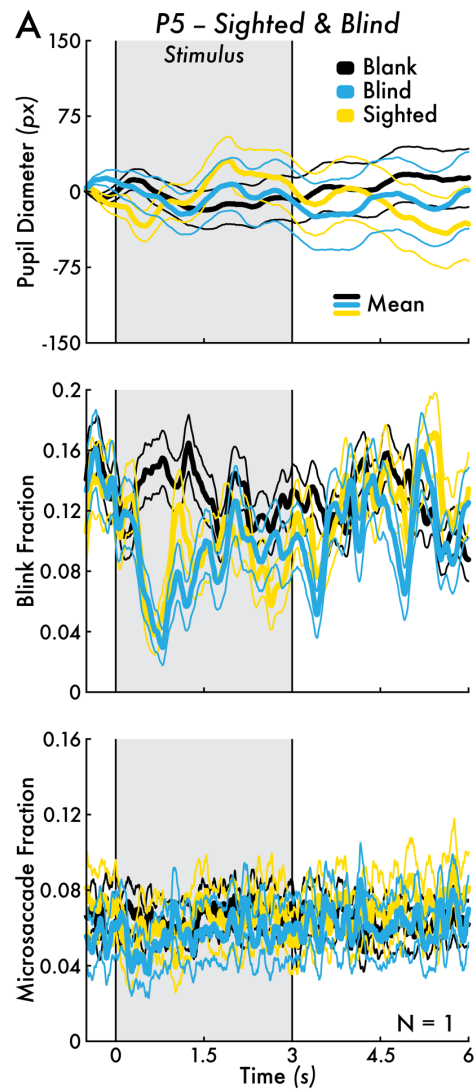


Kronemer, Suwanamalik-Murphy *et al.*, in preparation

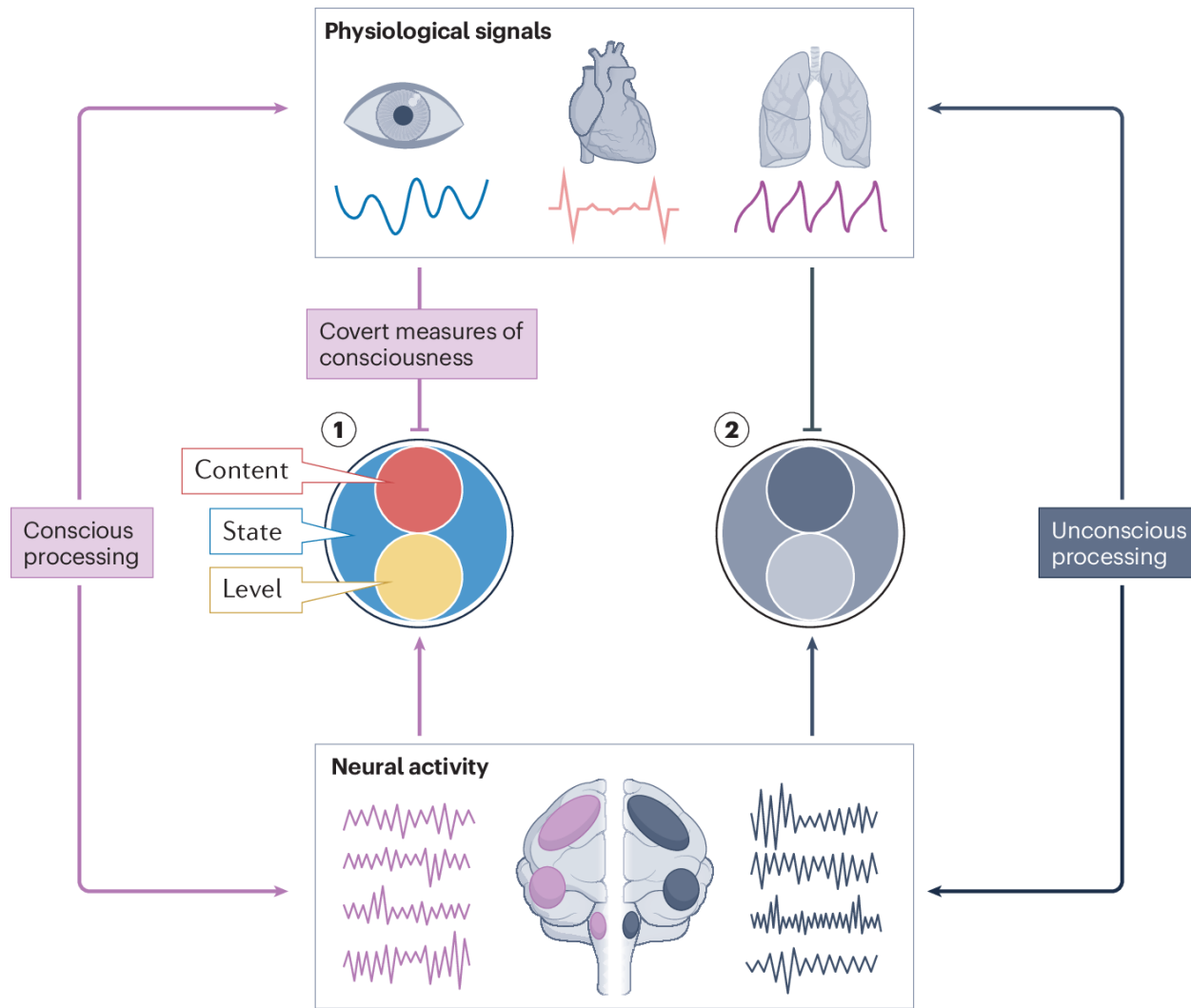




Unconscious processing
Impaired perception



Kronemer, Gobo, *et al.*, *Communications Biology*, 2025



Kronemer *et al.*, *Nature Reviews Neuroscience*, 2025

Collect eye behaviors!

They can be informative of conscious and unconscious neural processing.

National Institutes of Health



Peter Bandettini



Burak Akin



Catherine Walsh



A. Tyler Morgan



Pete Molfese



Cassie Levesque



Dan Handwerker



Tori Gobo



Javier Gonzalez-Castillo



Josh Teves



Micah Holness



Shruti Japee



Grace Edwards



Amaia Benitez Andonegui



Aria Wang



Anna Namyst



Paul Taylor



Plyfaa Suwanamalik-Murphy



Eli Merriam



Diana Burke



Jeff Stout



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Josh Faskowitz



Francisco Pereira

Georgetown



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Beth Rispoli



Benjamin Osborne

Yale



Hal Blumenfeld



Francois Stockart

Harvard



Renzo Huber



Bahar Shamsavarani

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Nadine Dijkstra



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Diana Gamboa

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