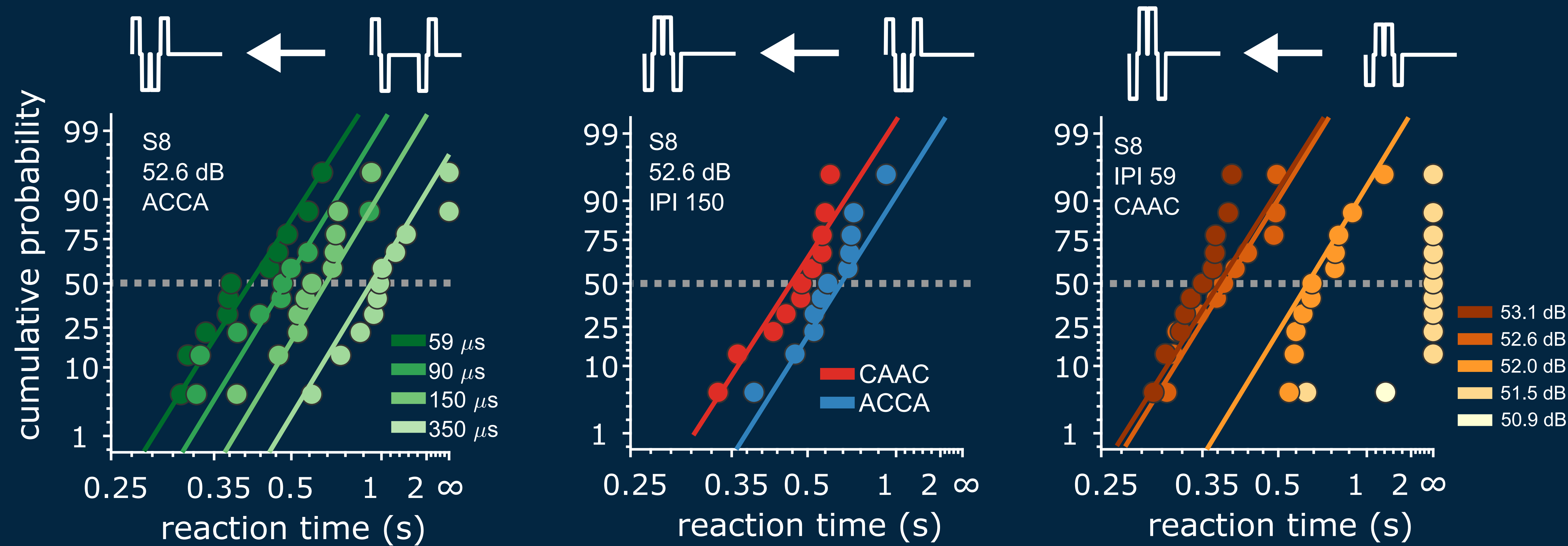


"From μ to m" μ s temporal interactions yield ms reaction-time changes for CI users



1881: Reaction times capture temporal interactions in electrical hearing

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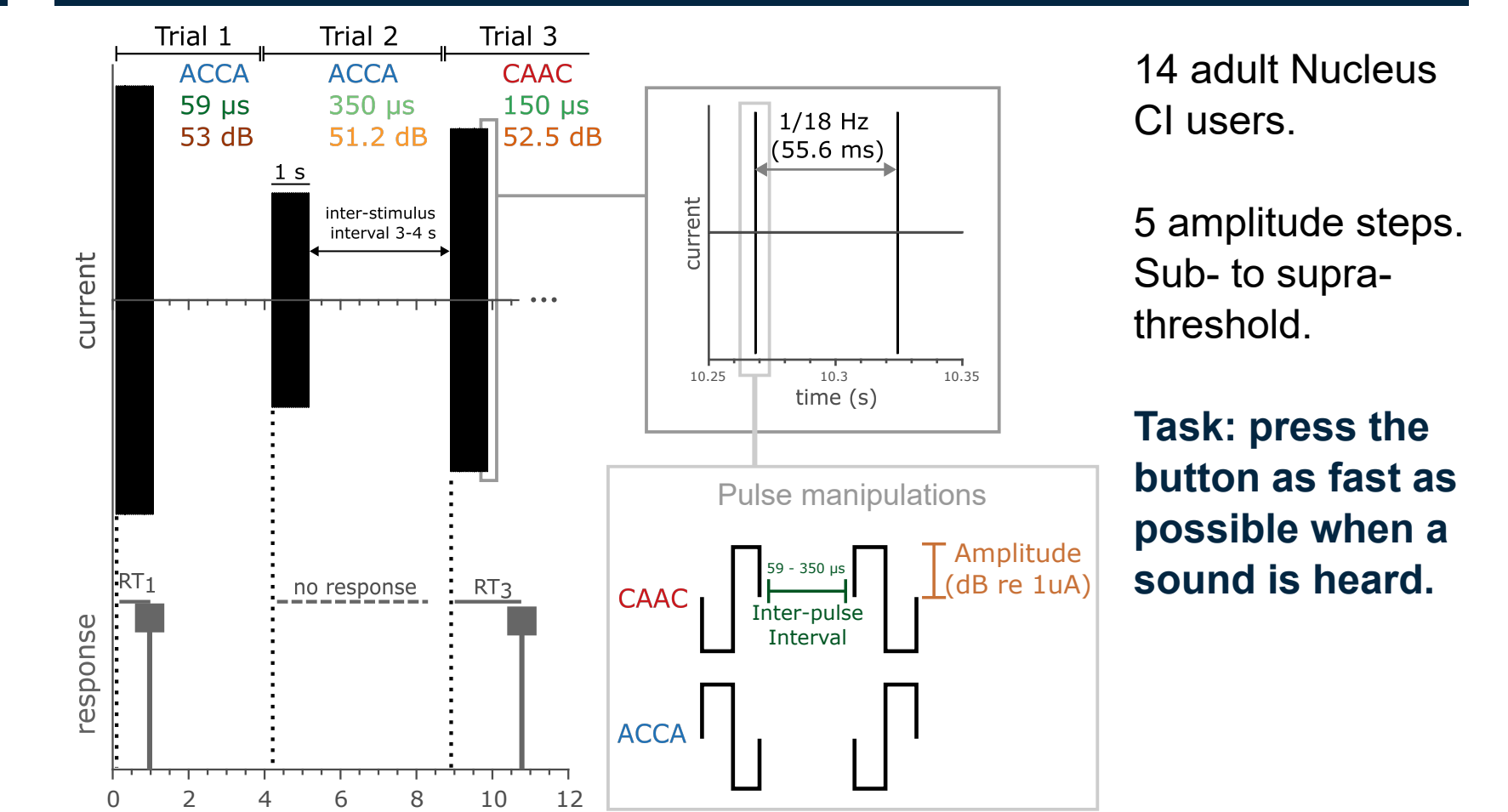
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Questions

- 1) Reaction times as an objective measure of temporal interactions?
- 2) What are the effects of stimulus amplitude, polarity and pulse separation on the time it takes for a CI user to make a decision?
- 3) What are plausible mechanisms for reaction time changes for pulses with short separation?

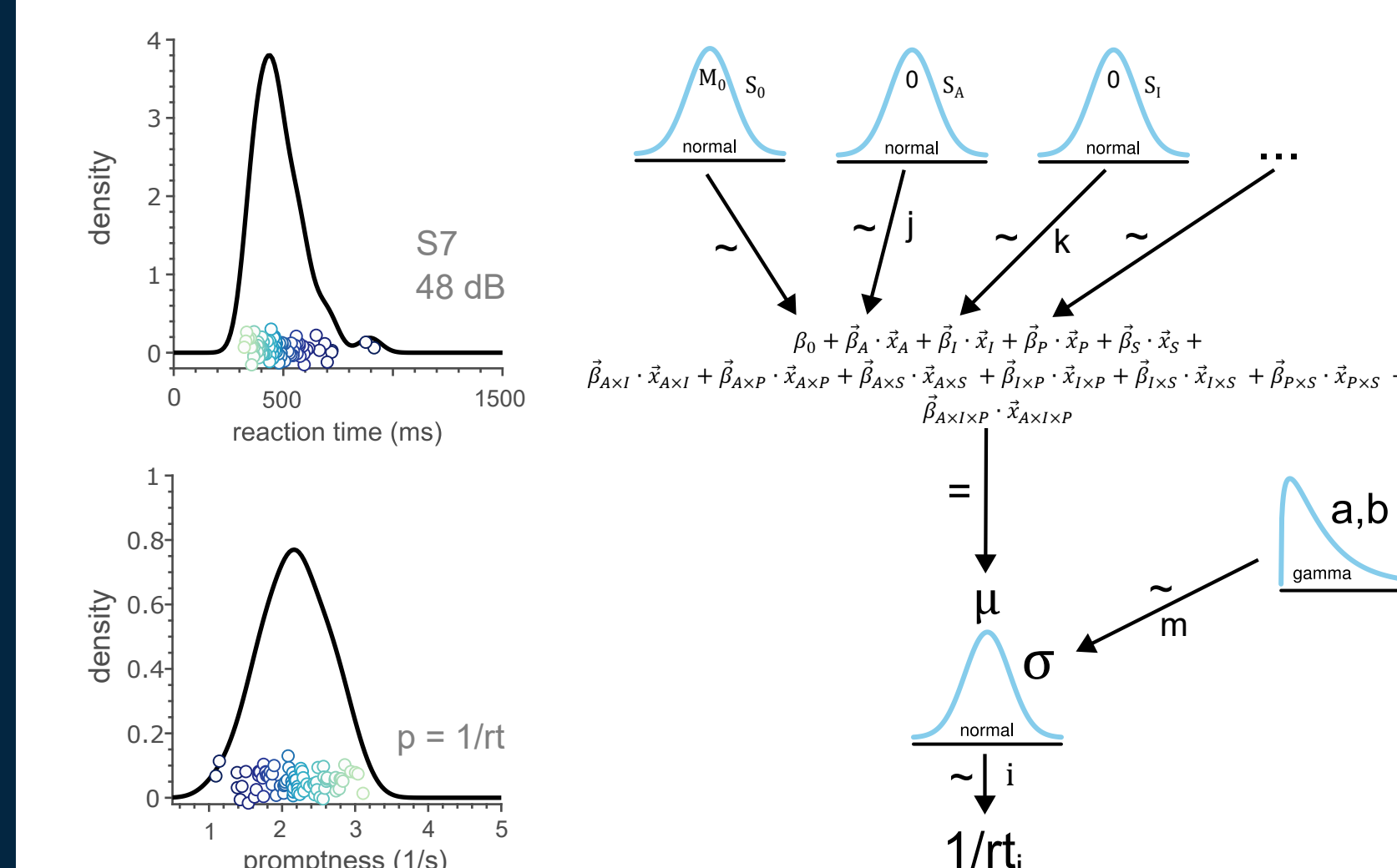
Experimental methods



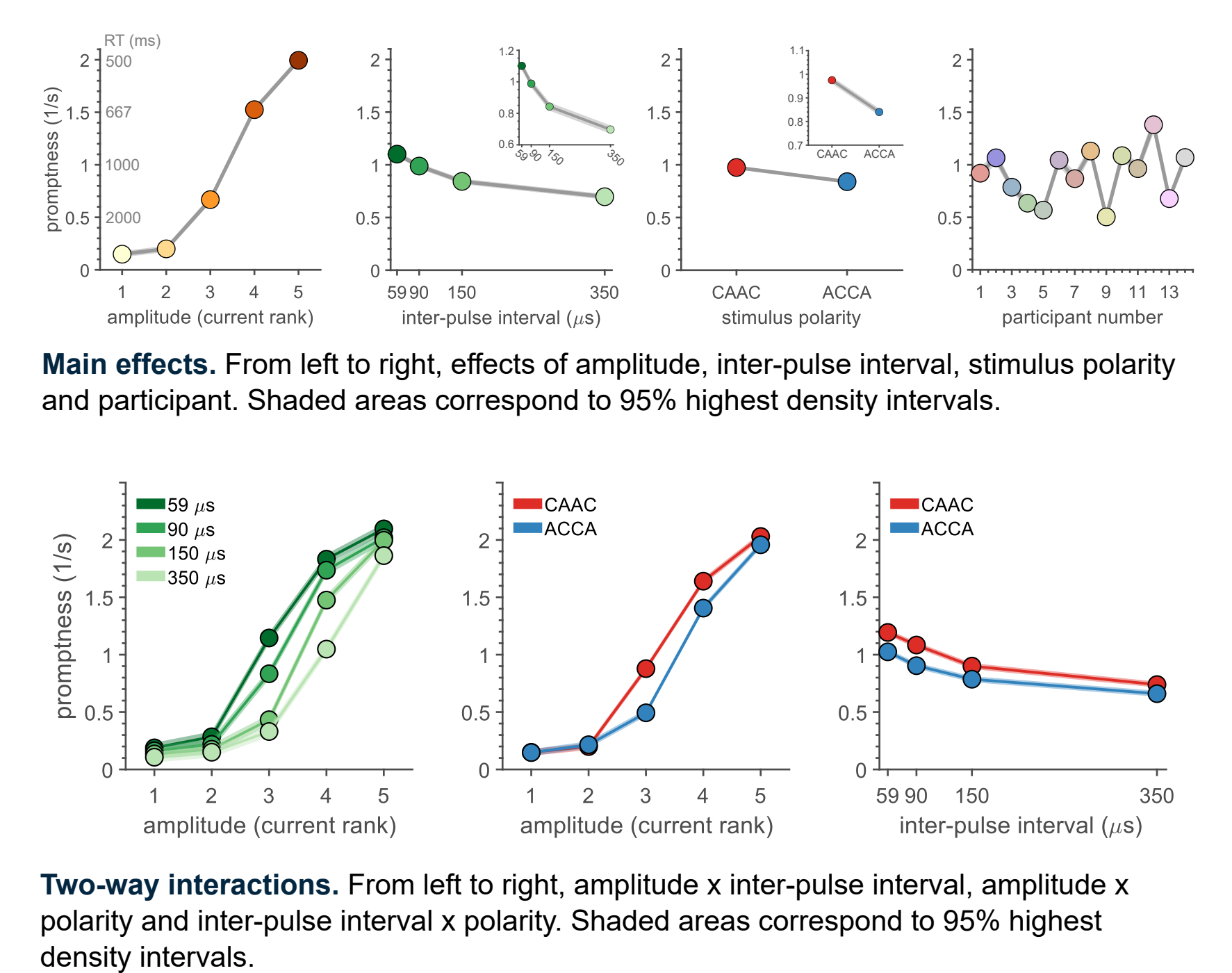
Statistical model

Methods

Analysis of variance applied to reciprocal reaction times (promptness). **Increasing promptness = faster response**
Trials without responses included as interval censored data ($[0-0.25]$ s⁻¹ or $[4-\infty]$ s).

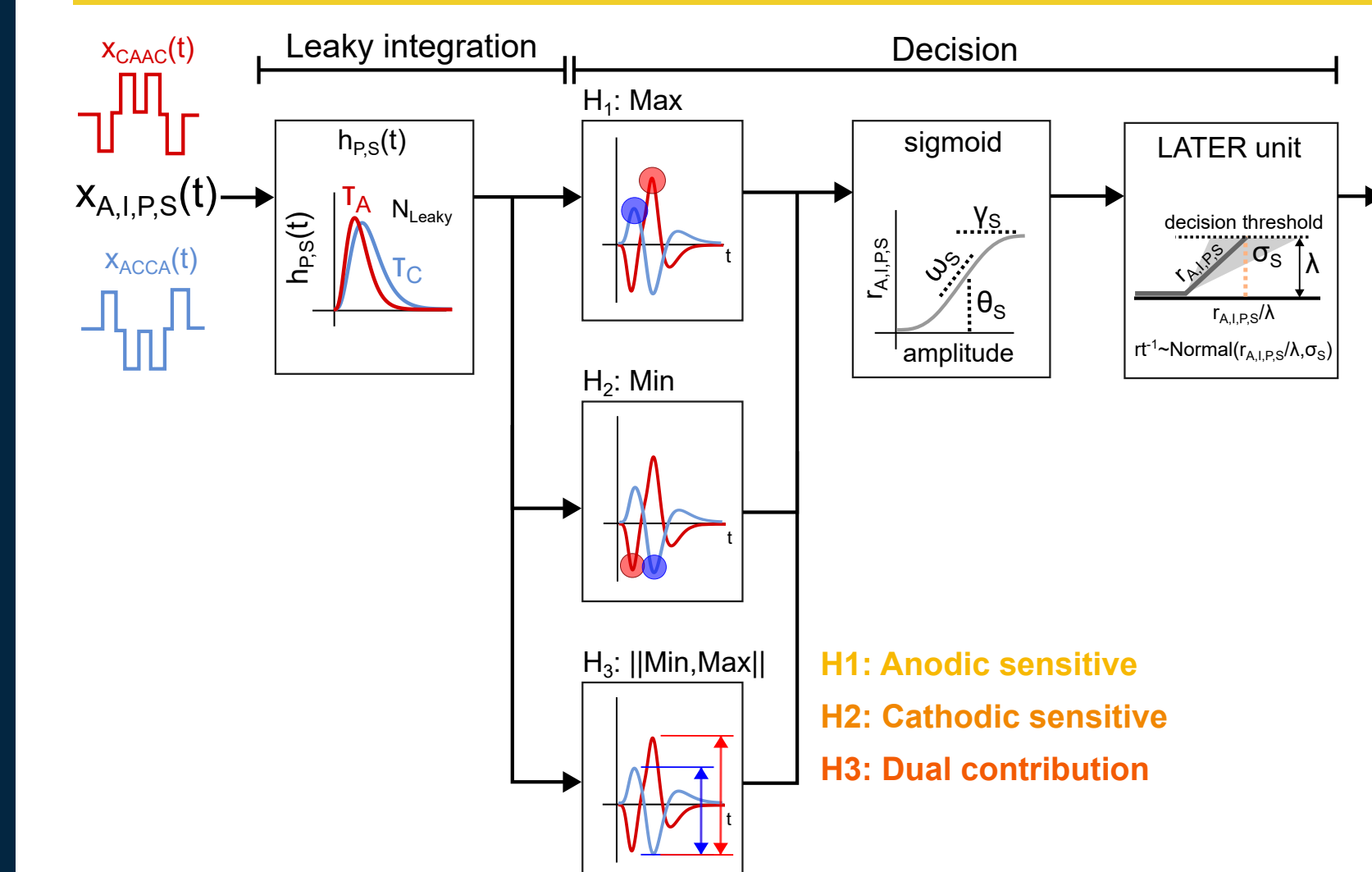


Results



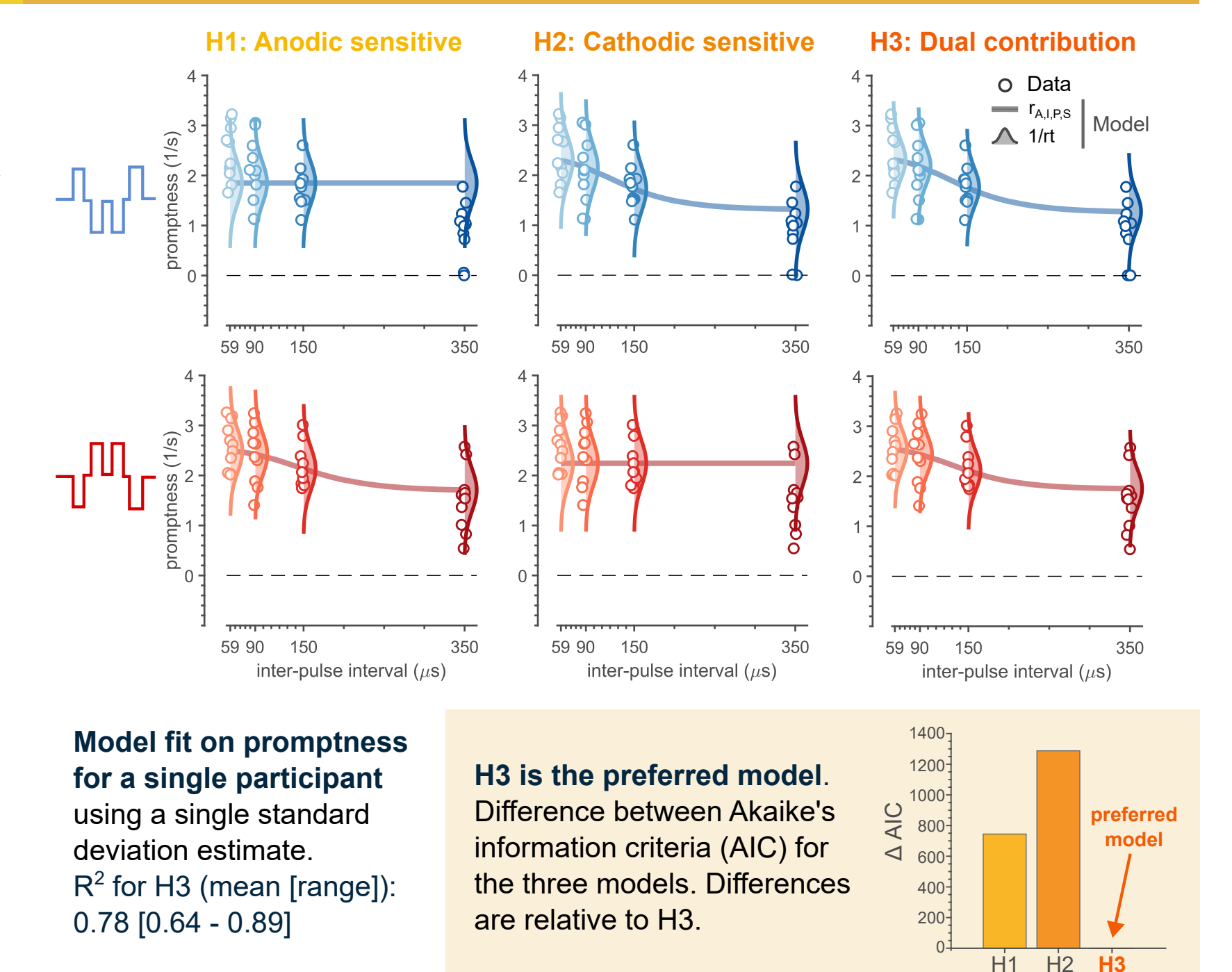
Neurobiological model

Methods



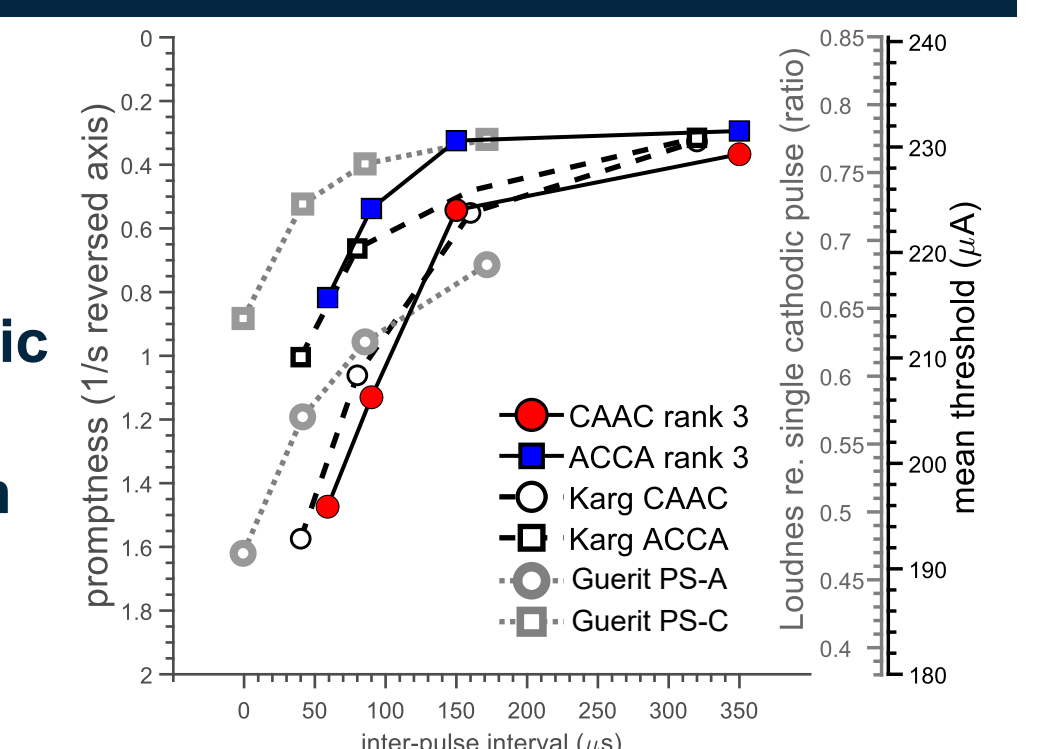
A model for reaction time (rt), based on leaky integration of the input stimulus and a decision stage testing different hypotheses (H1, H2, H3). Subscripts indicate dependence on amplitude (A), inter-pulse interval (I), polarity (P), and participant (S). LATER stands for Linear Approach to Threshold at Ergodic Rate³.

Results



Discussion

- 1) Reaction times are a valid method, being comparable to previous data^{1,2}.
- 2) Decreasing the inter-pulse interval leads to faster responses. In line with temporal integration at the auditory nerve.
- 3) Pulses with consecutive anodic phases interact more strongly than their cathodic counterpart, leading to shorter reaction times.
- 4) The best fit neurobiological model suggests the need to account for both phases in the process of latency generation.



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References

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