

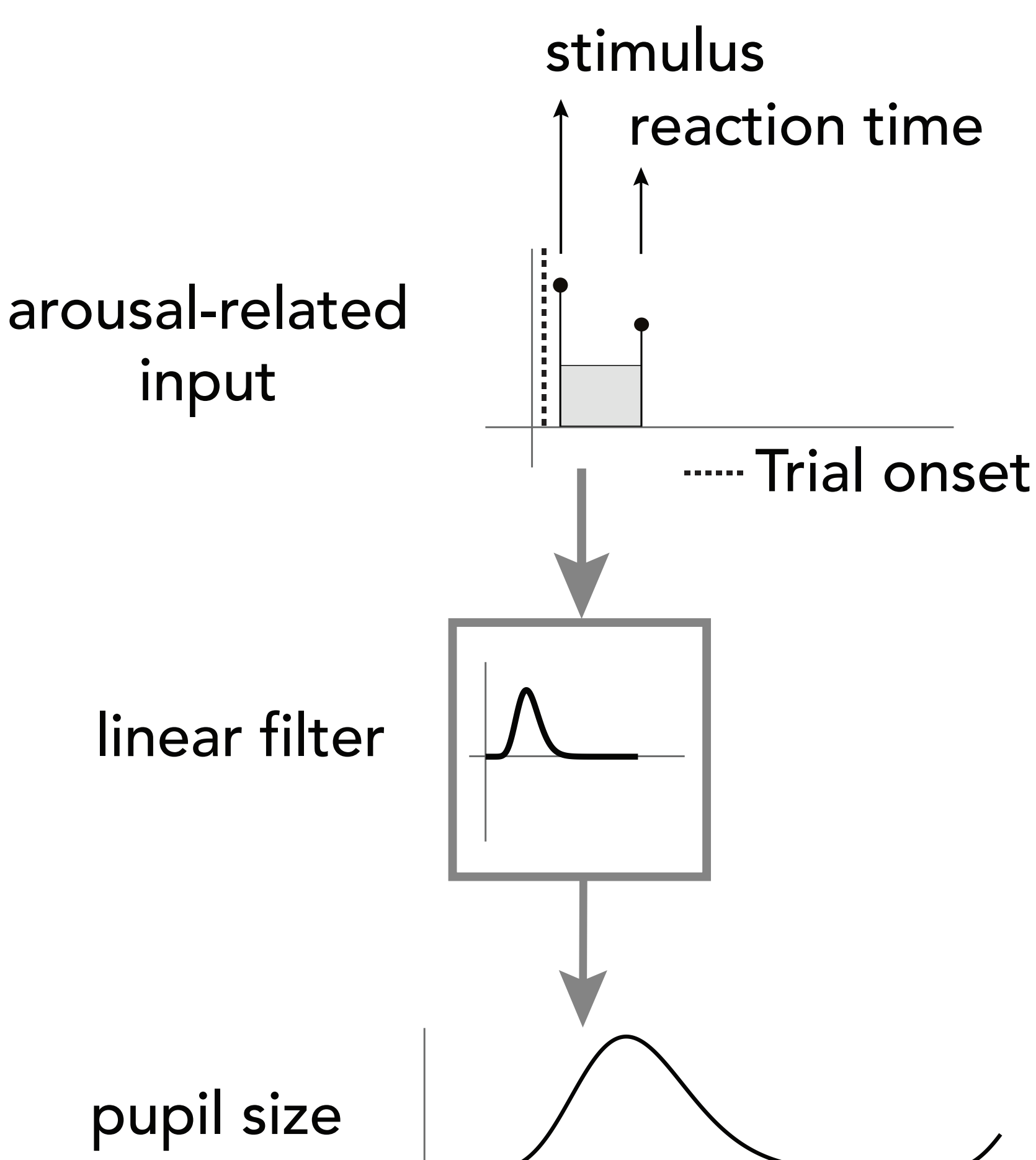
A unified model of the task-evoked pupil response

 **NYU** | **Charlie S. Burlingham^{1*}, Saghar Mirbagheri^{2*}, & David J. Heeger^{1,3}**

¹ Department of Psychology, New York University, ² Graduate Program in Neuroscience, University of Washington, ³ Center for Neural Science, New York University

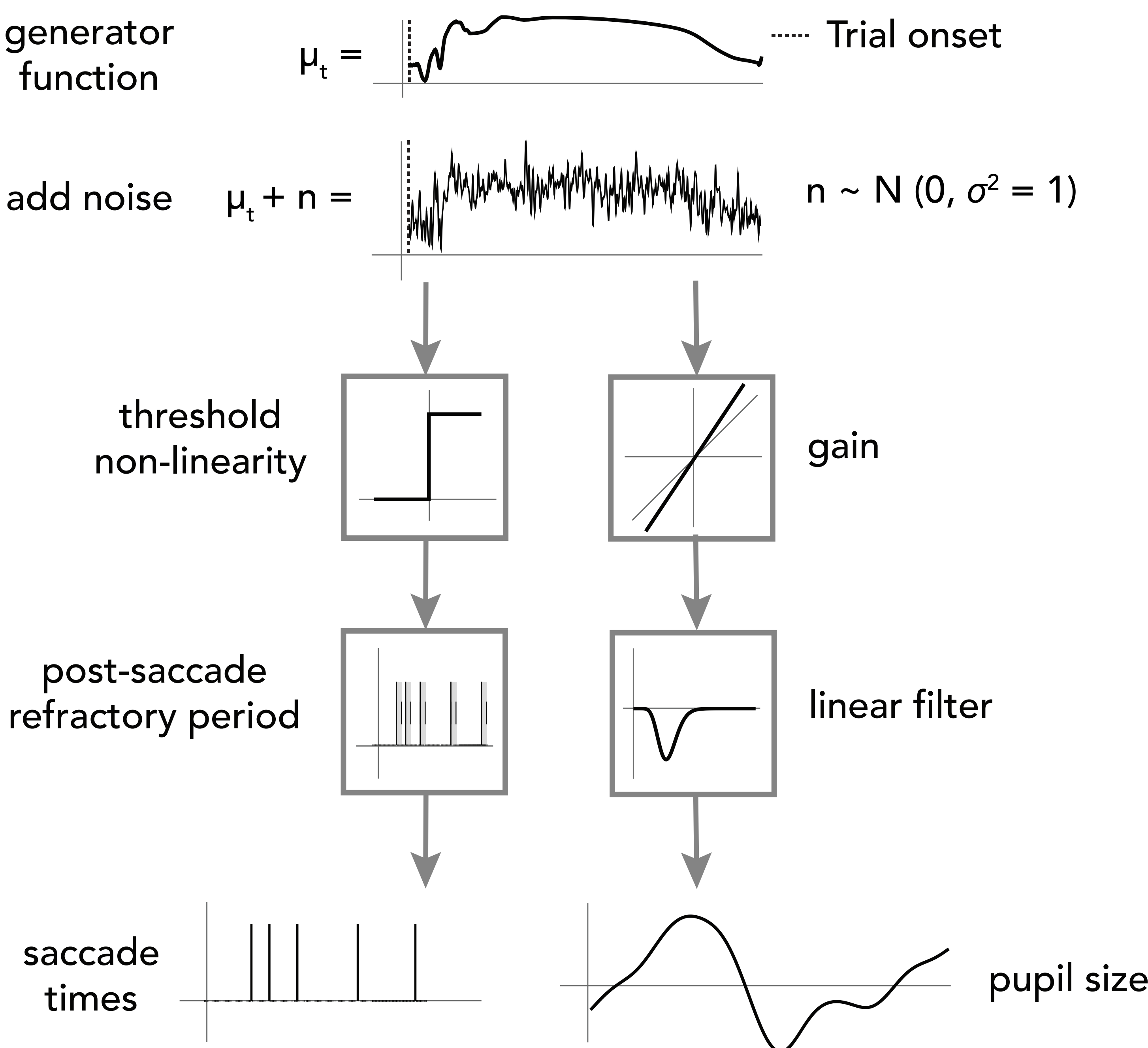
Aim: Is pupil size a linear transform of arousal-related impulses time-locked to task events?

Consensus model



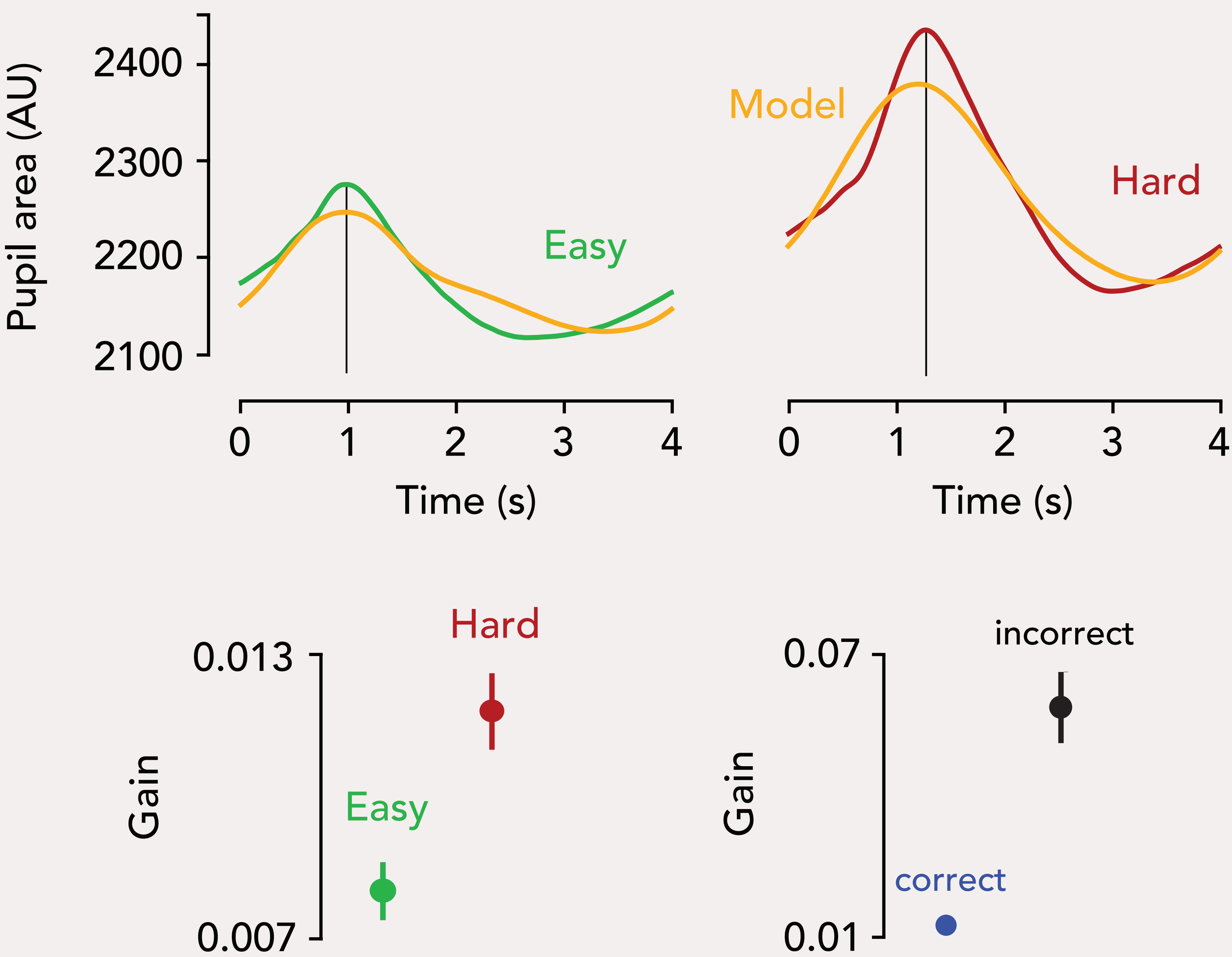
1

Our common drive (CD) model



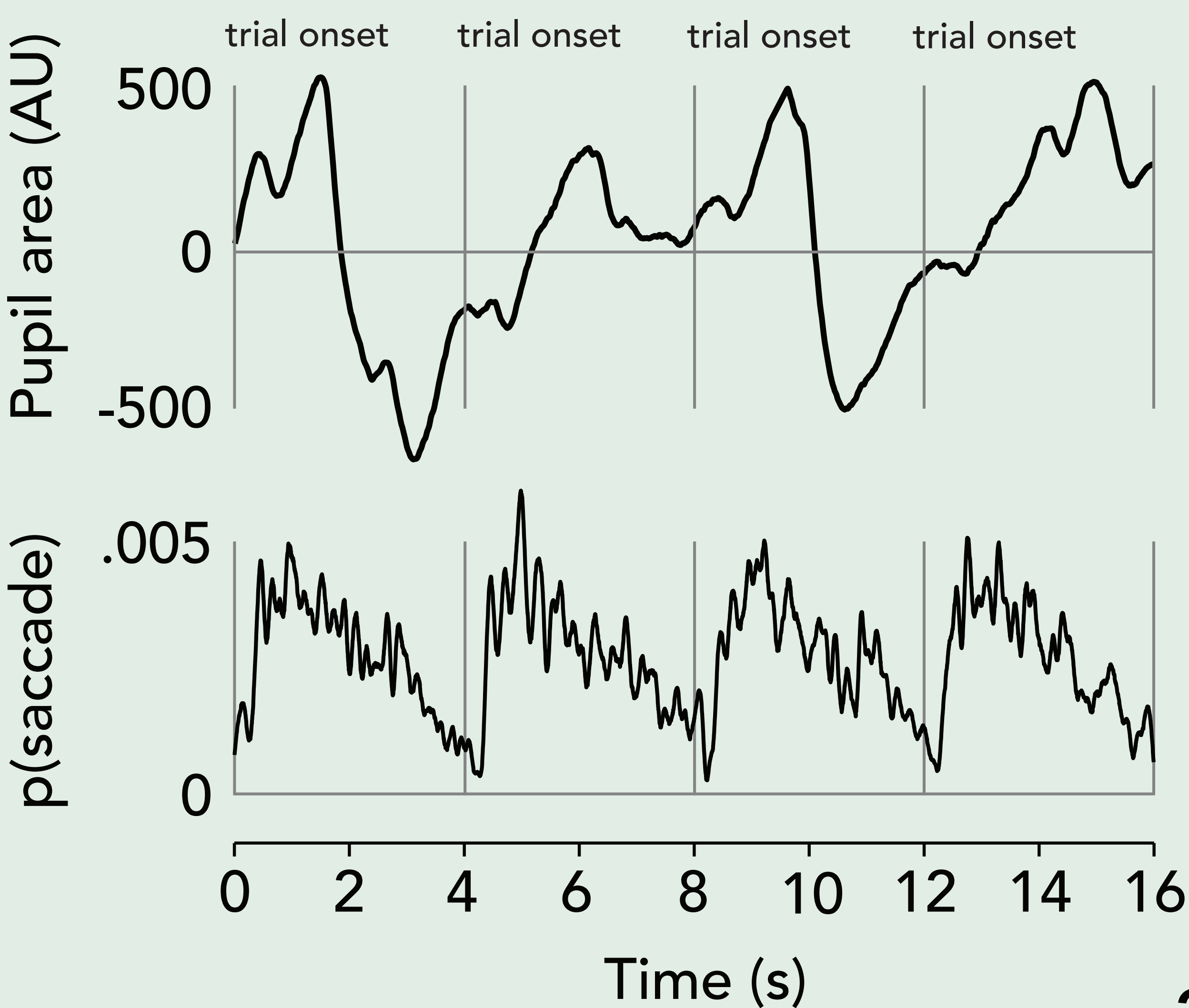
3

Gain reflects arousal



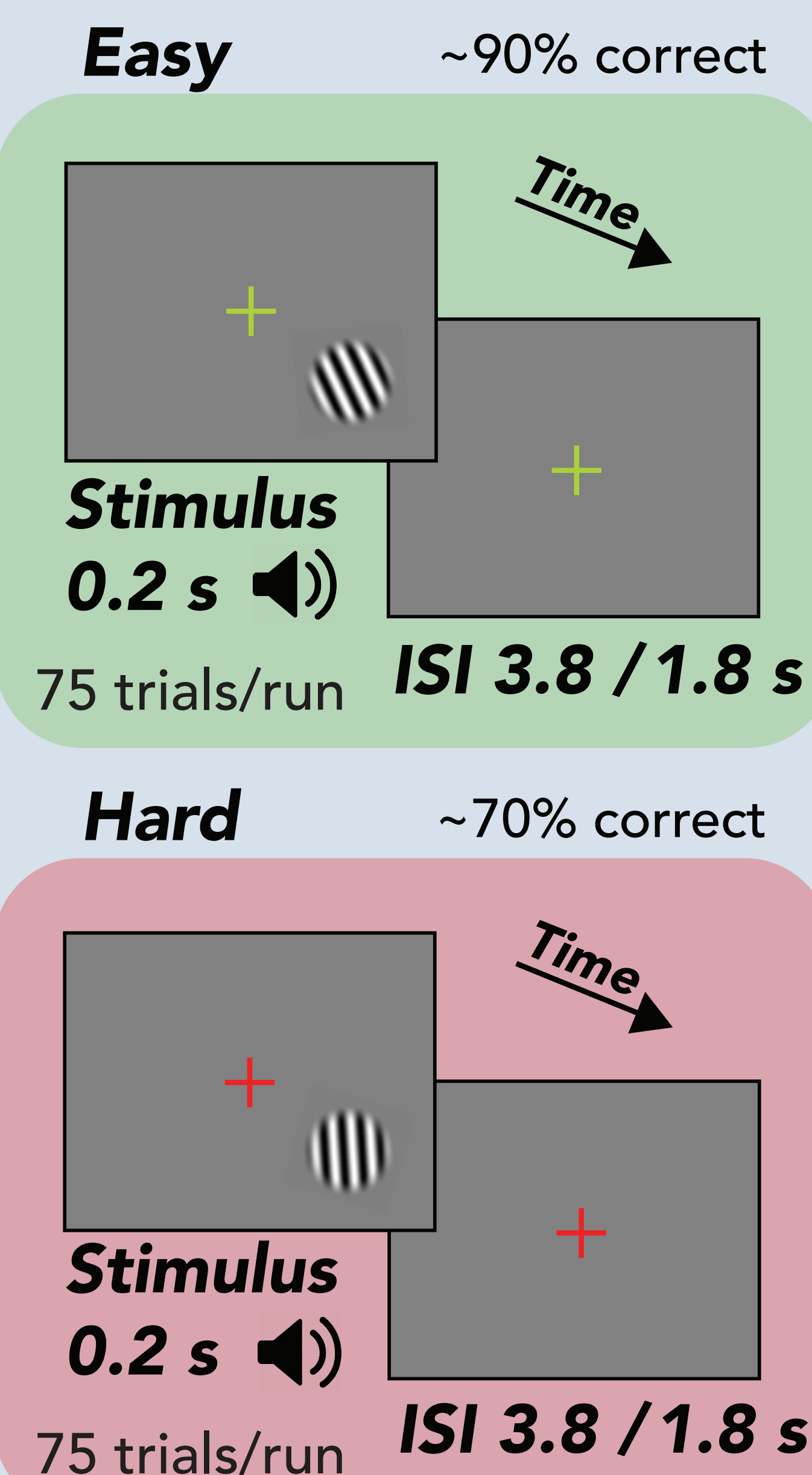
6

Pupil size and saccades entrain to task timing



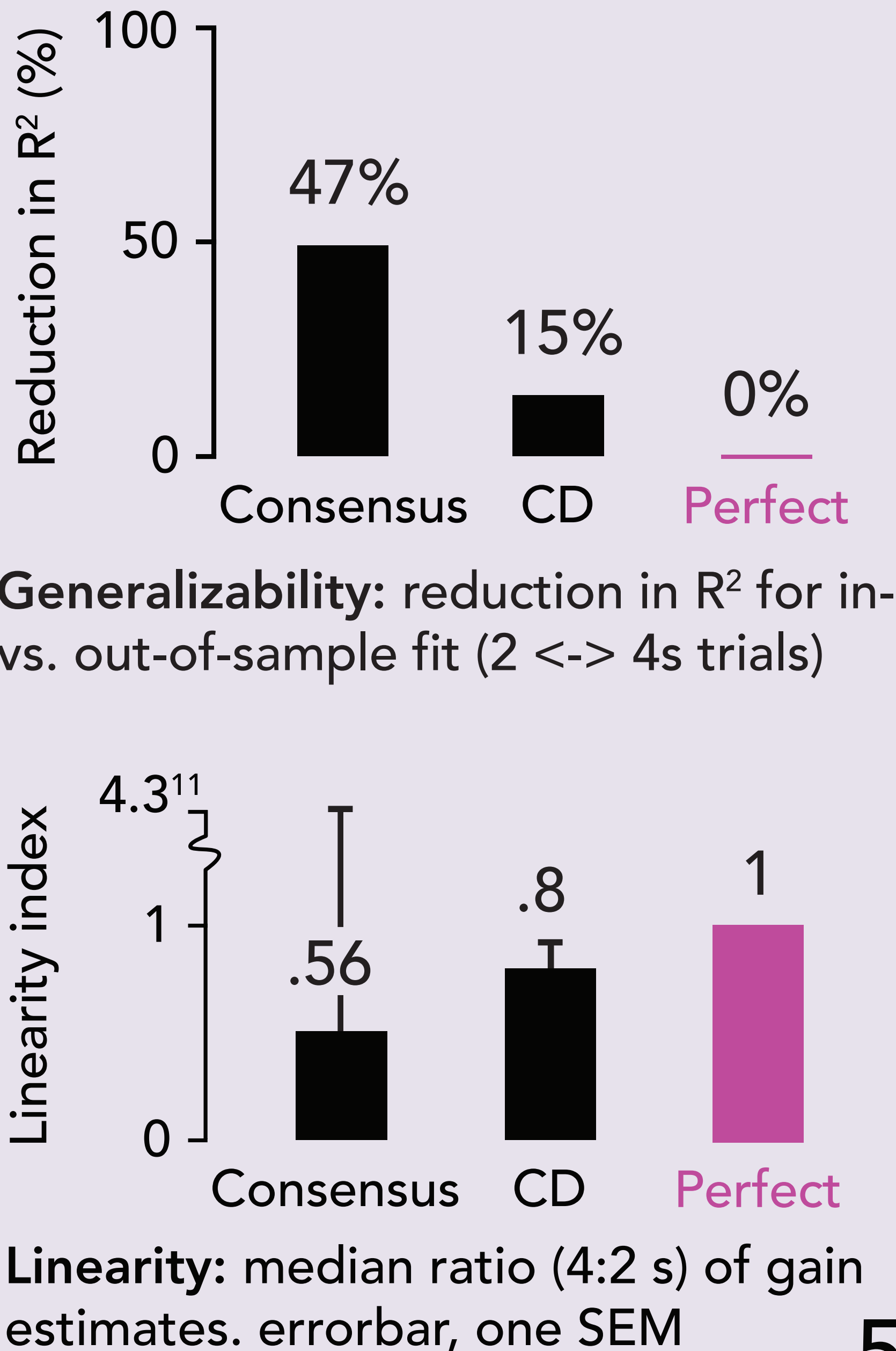
2

Task design



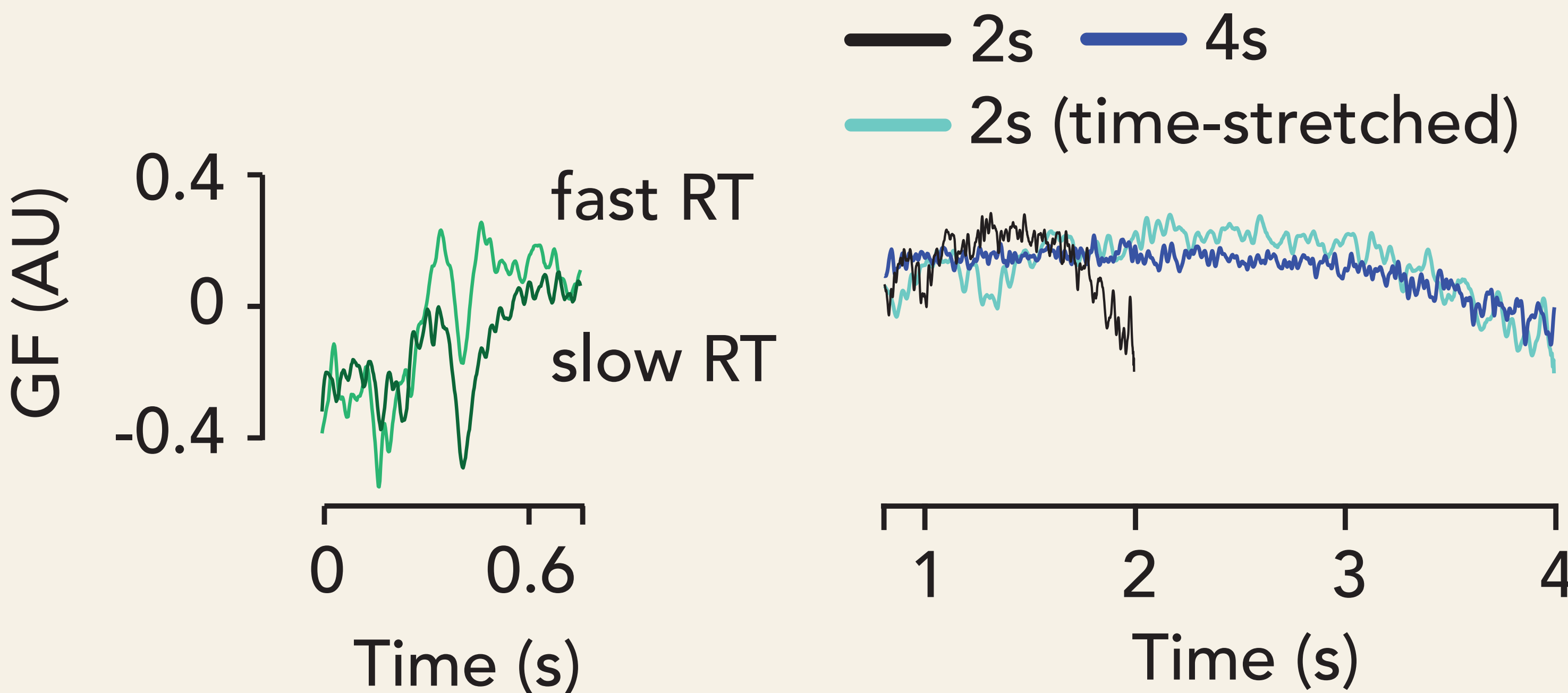
4

Model comparison



5

Generator function reflects timing



7

Answer: No, pupil size is a linear transform of gain-modulated generator function. Gain reflects arousal; generator function reflects timing of task & behavior.

**contributed equally. Email: charlie.burlingham@nyu.edu. Support: NEI R01-EY025330 (to DJH), NDSEG (to CSB). Thanks to: Eli Merriam, Mike Landy*