



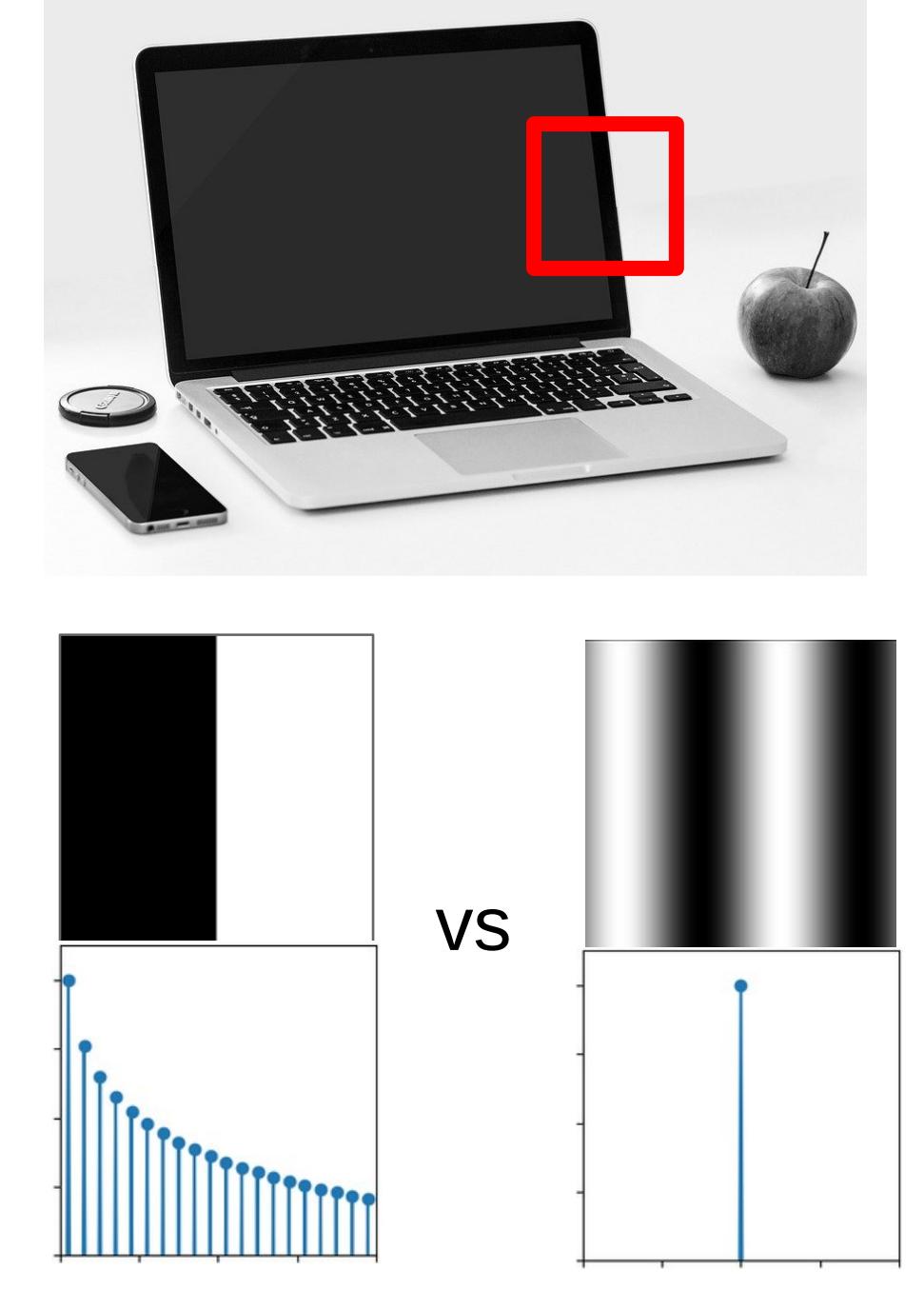
# Is edge sensitivity more than contrast sensitivity?

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## Background



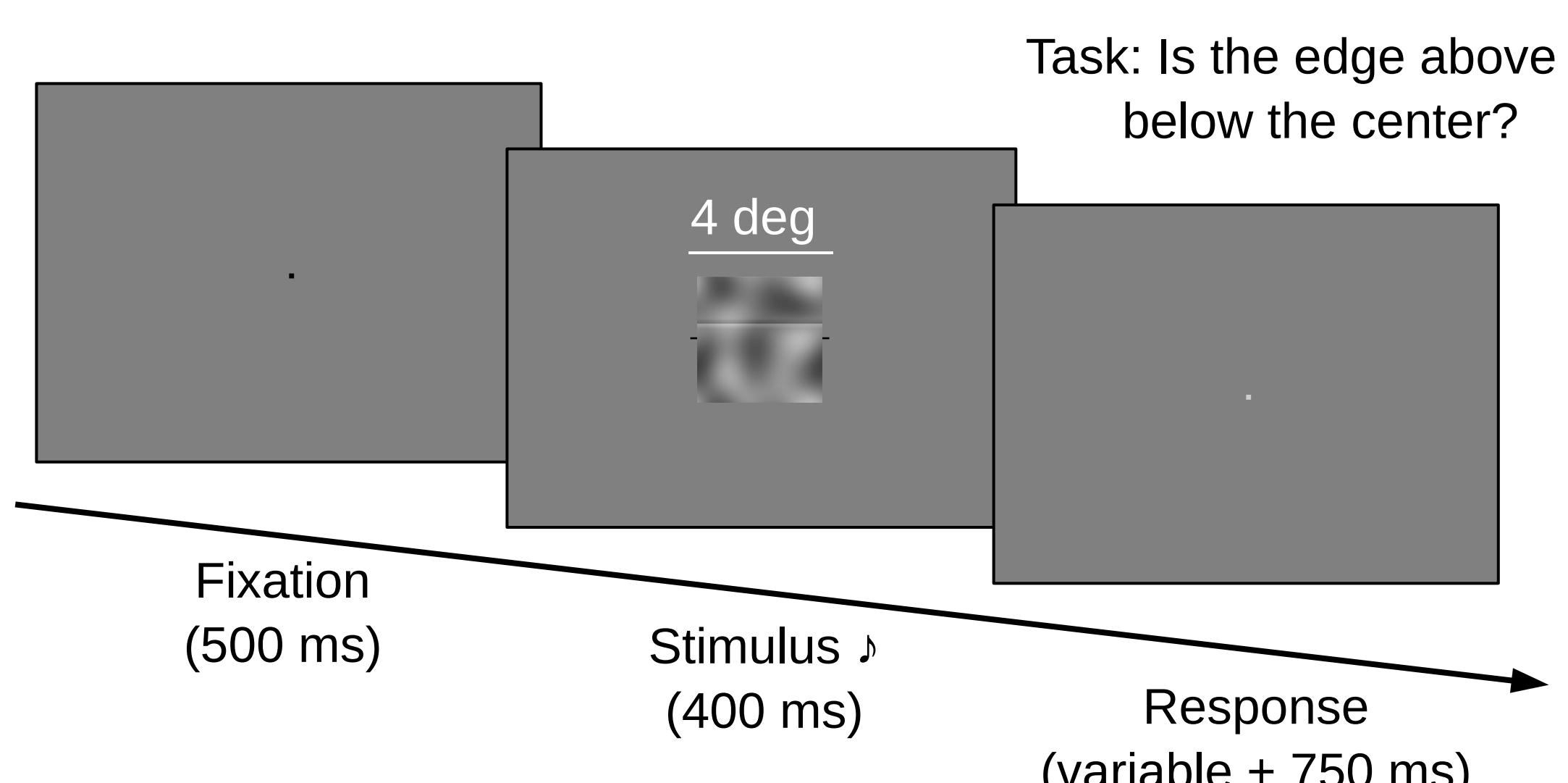
- Sharp edges abound in the real world and indicate object boundaries
- Most knowledge about spatial vision comes from studies with gratings
- Assumption: initial linear frequency decomposition + nonlinearities [1-3]

Is edge sensitivity  
more than sinusoidal  
contrast sensitivity?

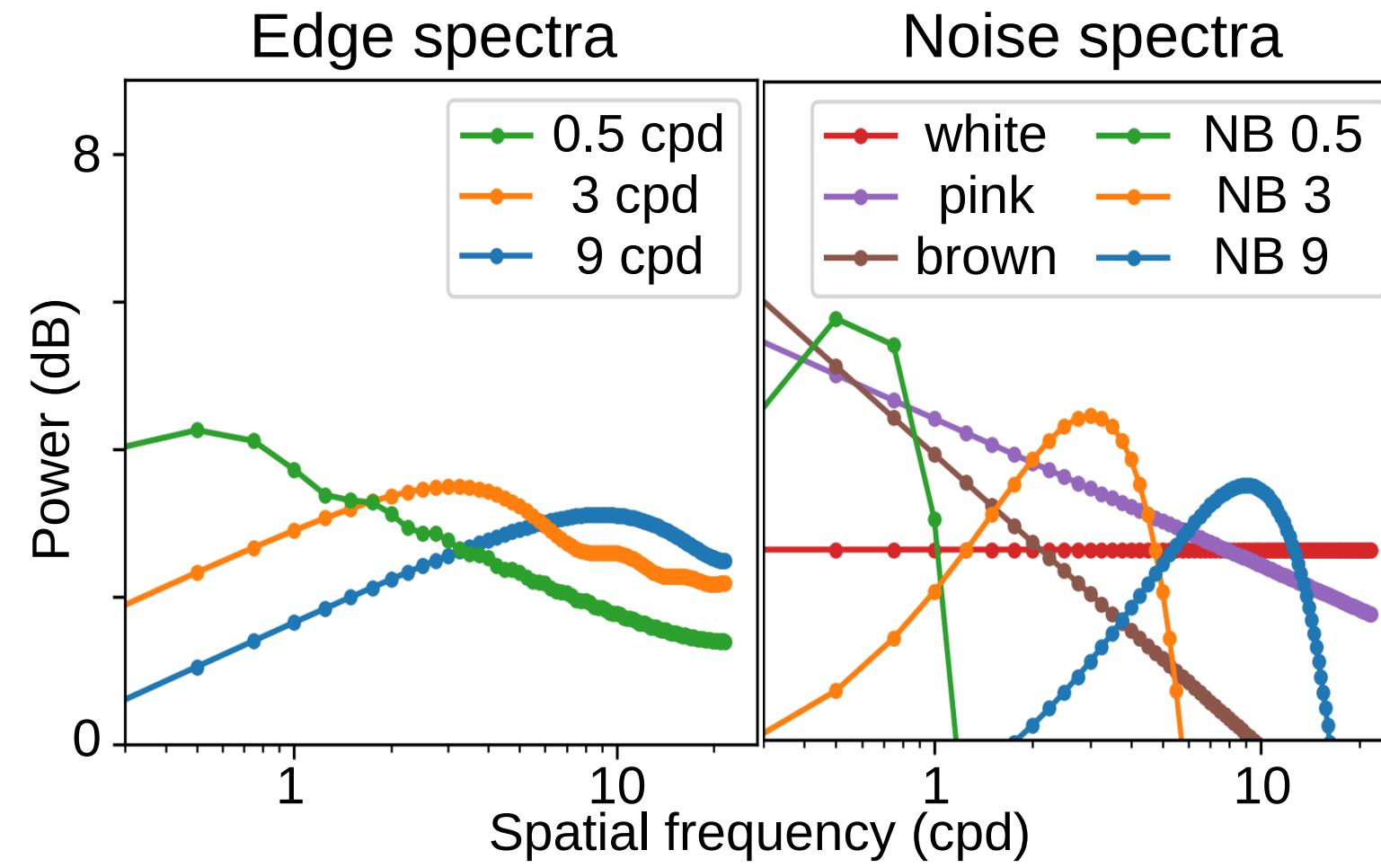
## Experimental design

We tested edge sensitivity in a noise-masking paradigm (2AFC)

- 3 Cornsweet edges (SF peaks: 0.5, 3, 9 cpd), 5 contrasts
- 3 broadband noises (white, pink, brown)
- 3 narrowband noises (NB0.5, NB3, NB9 cpd)
- mean luminance: 100 cd/m<sup>2</sup>; noise rms-contrasts: 0.2

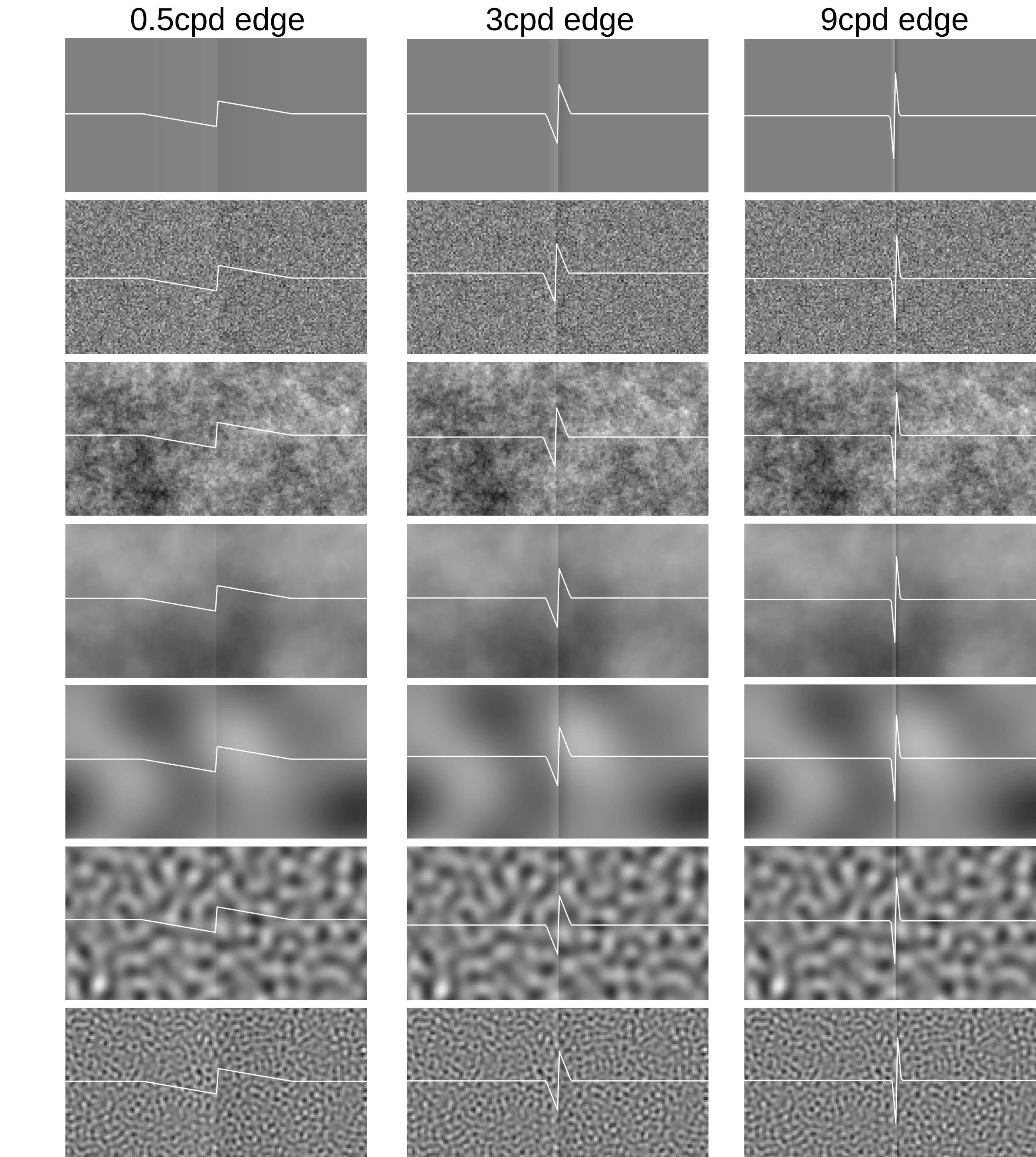


Noise properties were chosen to 1) map the sensitivity profile (narrow-band), and 2) investigate nonlinear interactions (broadband)

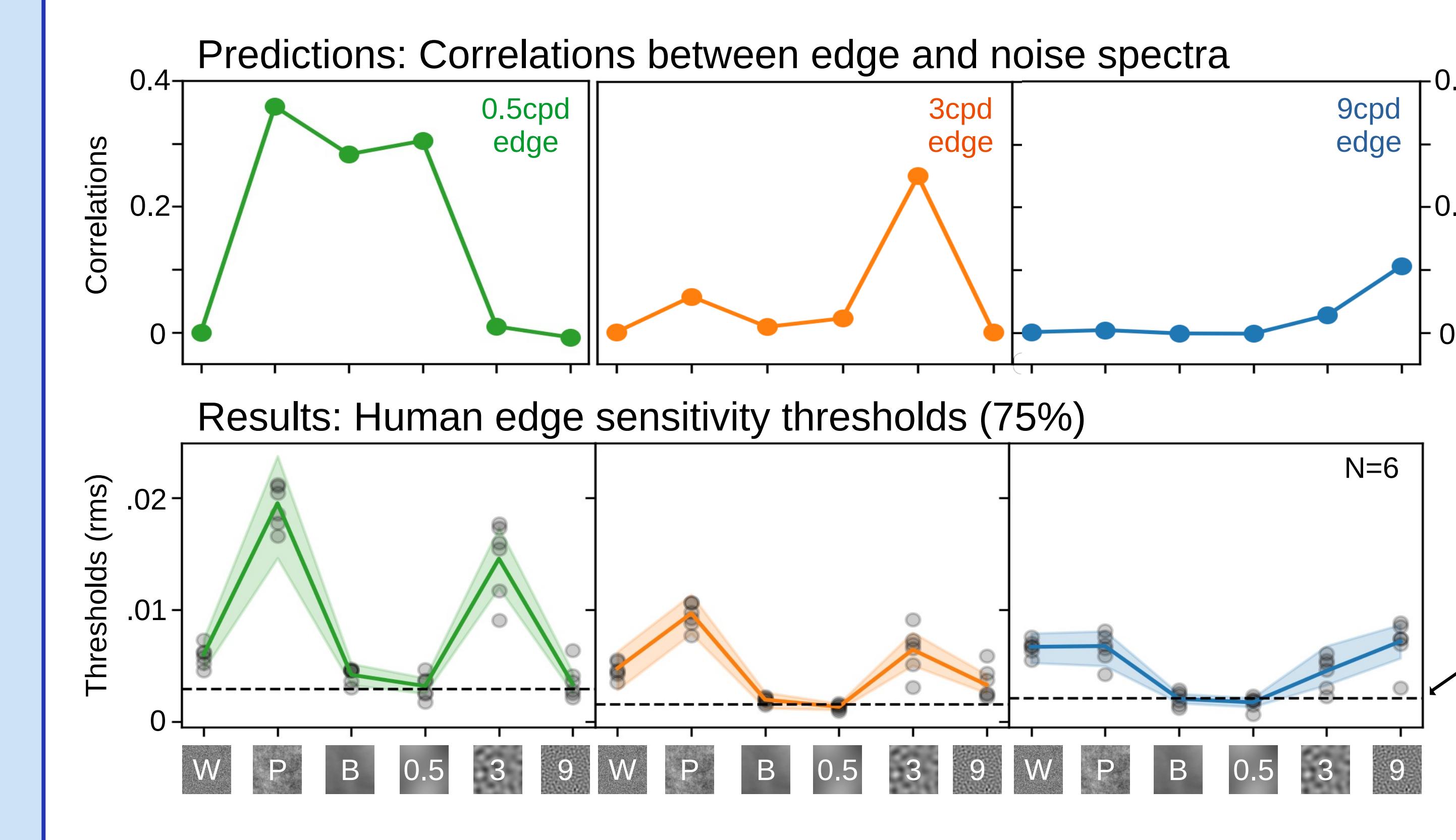


We tested  
edge sensitivity  
(2AFC) with  
3 edges &  
7 noises

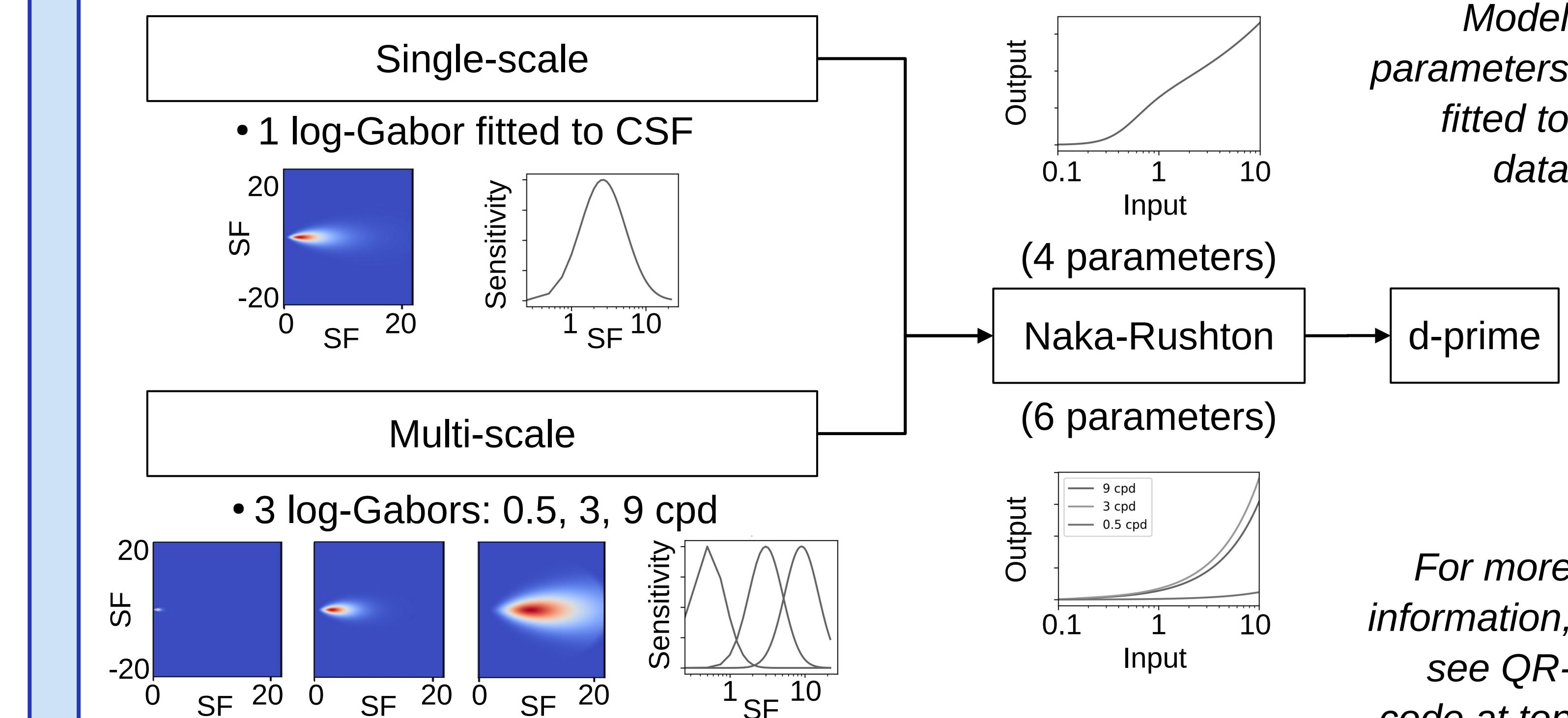
## Stimuli



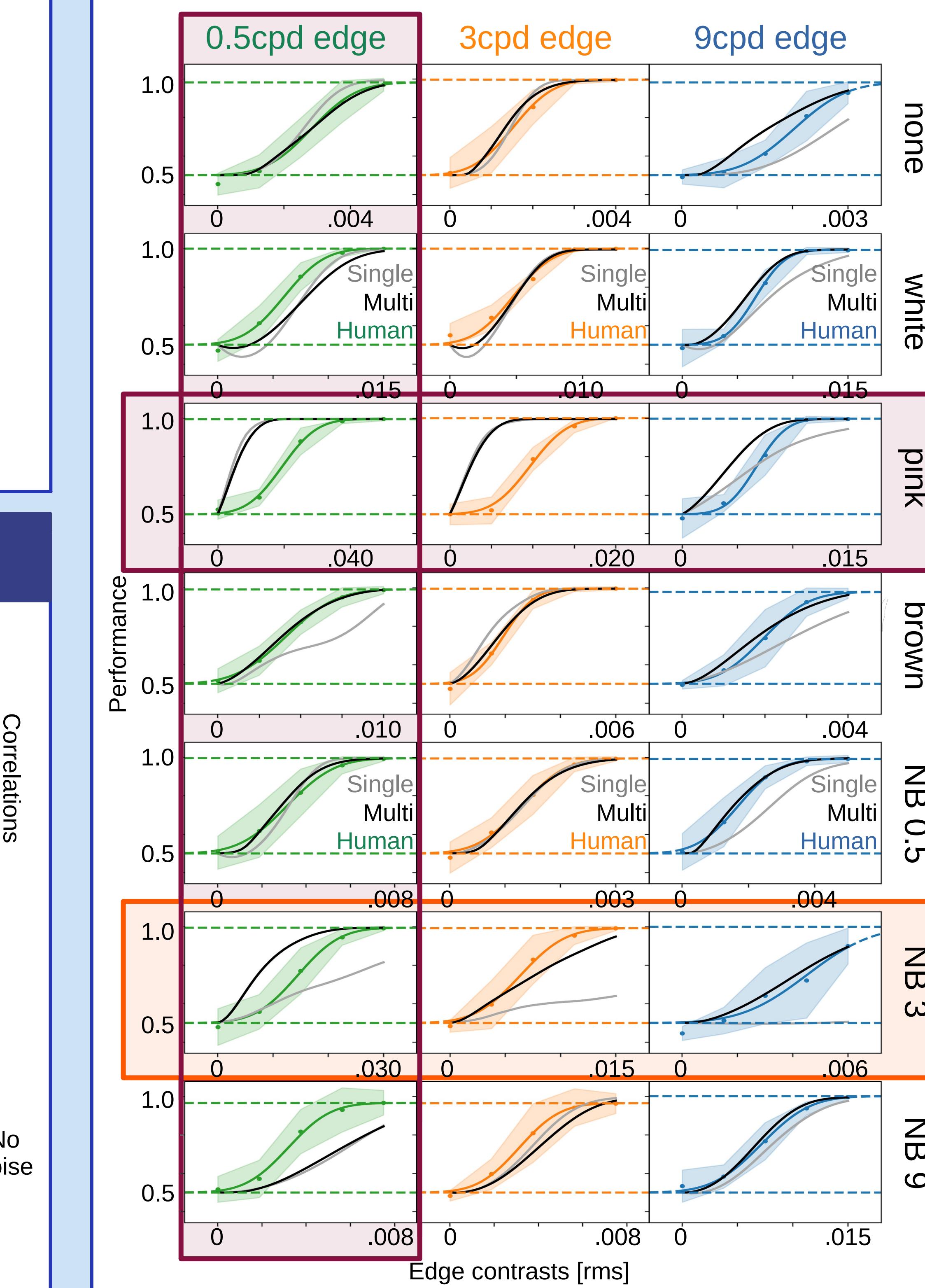
## Predictions & Human data



## Model architectures



## Human & model psychometric curves



Contrast  
sensitivity  
mechanisms  
account for  
edge  
sensitivity

Multi-scale  
model  
outperforms  
single-scale  
model

Systematic  
model failures  
at low SFs for  
both models