

# A population response model of spatial crowding over time

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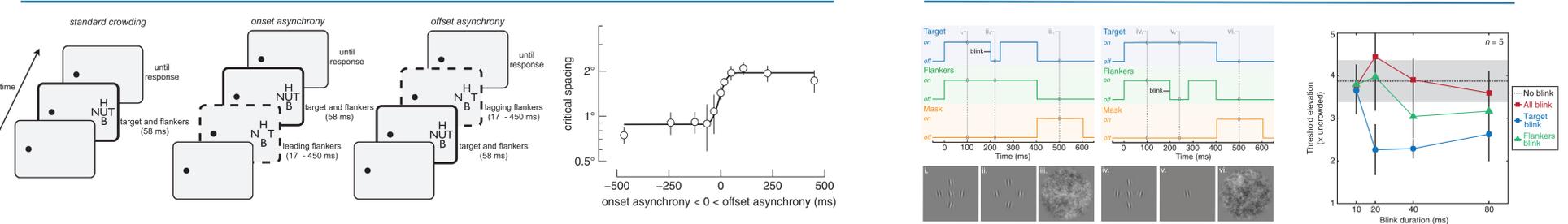
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## Background

Recent studies have found crowding is greatly affected by the relative timing of target and flankers.

Harrison & Bex, 2014

Greenwood, Sayim & Cavanagh, 2015



The aim of the present study was to test if a population code could account for these data.

## Model

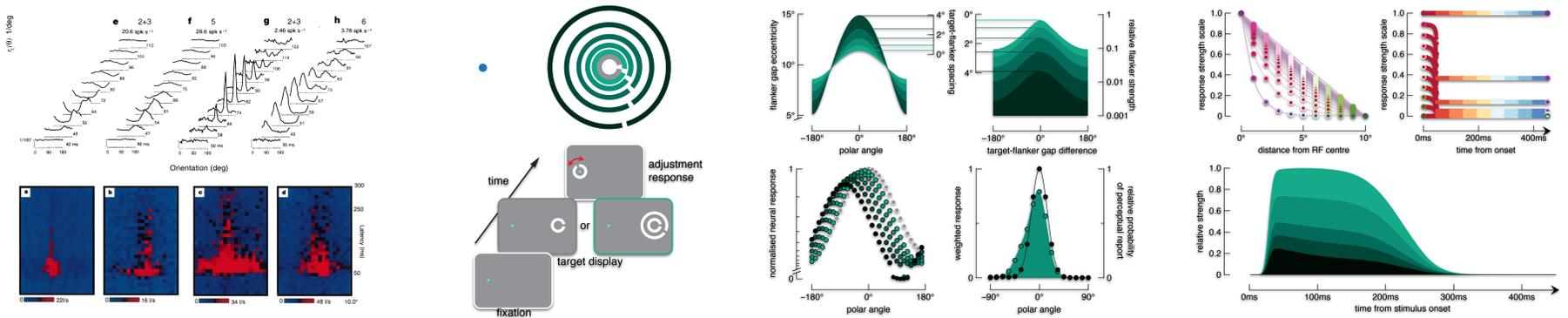
Target and flankers are weighted and combined according to their positions within a spatio-temporal receptive-field.

Motivation

Stimuli and task

Spatial weights

Temporal weights



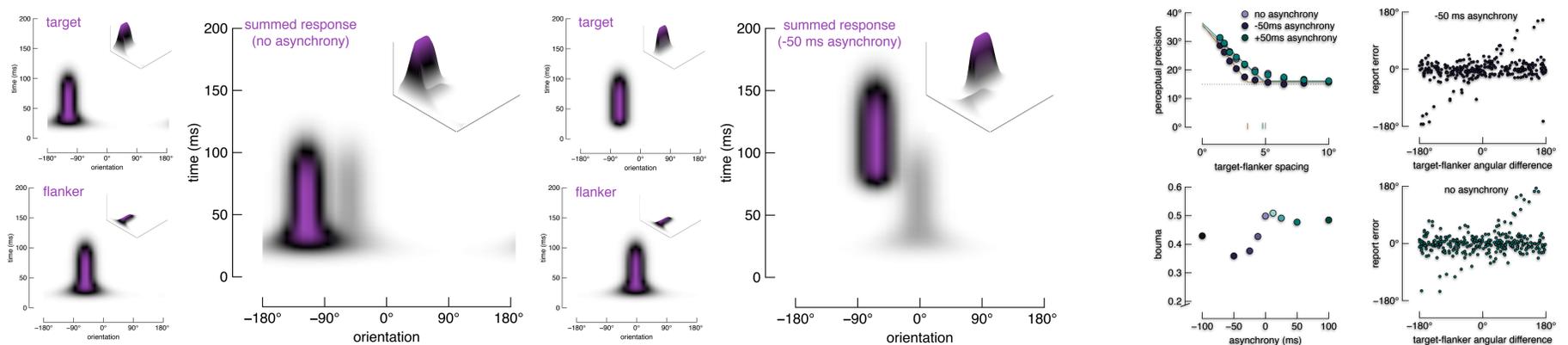
## Data

Spatio-temporal modifications of the population code reduce crowding when flankers precede targets.

Synchronous onsets

Flanker onsets prior to target

Simulated perceptual performance



## Conclusions and caveats

1. The model produces a reduction in crowding when flankers precede the target (consistent with Harrison & Bex and Greenwood et al).
  2. Only a minor exacerbation of crowding occurs when flankers offset after the target offset (contrary to Harrison & Bex but consistent with Greenwood et al).
  3. There is a robust reduction in critical spacing when flankers precede the target (consistent with Harrison & Bex but inconsistent with Greenwood et al).
- This hypothetical task is markedly different from tasks used previously — all data here require psychophysical validation.
  - Several assumptions about the spatio-temporal profile of the receptive field were made, such as the change in orientation tuning over time.

## References

