Detection in Context, Exp. 1 (prev. 3) - pre-registration document

# Deviations from pre-registration

Instead of occluding 5% or 10% of pixels on different trials, we occluded 5% or 15% of pixels.

# Results

## Participants

253 participants took part. Participants were excluded if their accuracy fell below 50% (0 participants). We also excluded participants for having extremely fast (0 participants) or slow (2 participants) reaction times in one or more of the tasks (below 100 milliseconds or above 5 seconds in more than 25% of the trials).

Trials with response time below 100 milliseconds (0.00 of all trials) or above 5 seconds (0.03 of all trials) were excluded from the response-time analysis.

### Hypotheses and analysis plan

This study is designed to test the timing of decisions to terminate evidence accumulation in the absence of a target as a function of stimulus occlusion.

*Hypothesis 1 (PRESENCE/ABSENCE RESPONSE TIME)*: We tested the null hypothesis that response times are similar for target-absent and target-present responses, aiming to replicate the finding that decisions about the absence of a target are slower than decisions about its presence (Mazor, Moran, and Fleming 2021; Mazor, Friston, and Fleming 2020).

A paired t-test on the median individual level-response times revealed a significant difference (, 95% CI , , ).

*Hypothesis 2 (OCCLUSION EFFECT IN PRESENCE)*: We tested the null hypothesis that target-present response times are similar when 5% or 15% of the pixels are occluded.

A paired t-test on the median individual level-response times in correct trials only revealed a significant difference (, 95% CI , , ).

*Hypothesis 3 (OCCLUSION EFFECT IN ABSENCE)*: We tested the null hypothesis that response times in target-absent responses are similar when 5% or 15% of the pixels are occluded.

A paired t-test on the median individual level-response times in correct trials only revealed a null effect (, 95% CI , , ).

*Hypothesis 4 (OCCLUSION RESPONSE INTERACTION)*: We tested the null hypothesis that the effect of occlusion on reaction time is similar in target-absent and target-present responses, by performing a group-level t-test on the subject-level contrast Where and stand for present and absent, and 5% and 15% represent the proportion of hidden pixels. Here too, analysis was restricted to correct trials only.

We find a significant interaction (, 95% CI , , ).

*Hypothesis 5 (SENSITIVITY)*: We tested the null hypothesis that perceptual sensitivity (measured as ) is equal as a function of the proportion of hidden pixels. To allow the extraction of d’ for participants who committed no false-alarms or misses, we added 0.5 to miss, hit, false-alarm and correct rejection counts (Snodgrass and Corwin 1988).

We find a significant drop in d’ as a function of occlusion (, 95% CI , , )

*Hypothesis 6 (CRITERION)*: We tested the null hypothesis that decision criterion (measured as ) is unaffected by the proportion of hidden pixels. To allow the extraction of a decision criterion for participants who committed no false-alarms or misses, we added 0.5 to miss, hit, false-alarm and correct rejection counts (Snodgrass and Corwin 1988).

We find a significantly more conservative criterion in high-occlusion trials (, 95% CI , , ).

# References

Mazor, Matan, Karl J Friston, and Stephen M Fleming. 2020. “Distinct Neural Contributions to Metacognition for Detecting, but Not Discriminating Visual Stimuli.” *Elife* 9: e53900.

Mazor, Matan, Rani Moran, and Stephen M Fleming. 2021. “Metacognitive Asymmetries in Visual Perception.” *Neuroscience of Consciousness* 2021 (1): niab025.

Snodgrass, Joan G, and June Corwin. 1988. “Pragmatics of Measuring Recognition Memory: Applications to Dementia and Amnesia.” *Journal of Experimental Psychology: General* 117 (1): 34.