Introduction

Previous works suggested changes of mind (CoM) in perceptual decision-making are solely due to post-decision evidence processing (Resulaj et al., 2009; Van den Berg et al., 2016).

We aim to evaluate the relationship between eye and hand movement in perceptual decision-making and changes of mind.

Our work presents evidence in favor of hypothesis that additional, metacognitive mechanisms are involved in CoM’s (Murphy et al., 2015; Fleming, 2016).

Methods

Fixed-duration (800 ms) random dots paradigm (Shadlen and Newsome, 2001)

Four adults (three female), 29 to 44

400 trials per coherence level per subject (total of 9600 trials)

Measures

• mouse trajectories

• gaze trajectories

Psychometrics

Result 1. Changes-of-mind occur in fixed duration task as often as in RT task

On average, 3.5% trials include a change-of-mind

Result 2. Reaction times in CoM trials are higher than usual

Changes-of-mind are much more likely in trials where the initial decision is delayed

Result 3. Eye movements signals preference, but not during CoM

In a typical trial, once the decision is initiated, a subject saccades to the chosen option

After a delay, mouse movement is initiated, following the saccadic eye movement

However, there is no prior indication of change-of-mind onset in gaze dynamics

This again indicates that CoM might be due to a different mechanism than the initial decision

Conclusions

In addition to post-decision evidence accumulation, top-down processes may be involved in changes-of-mind

Results consistent with Murphy et al. (2015) and Fleming (2016)

Subject’s personality (BIS/BAS, PANAS, and Jackson-5 scales) not a factor on performance

Future work: Dynamic computational modelling to account for results

References


