The Time Course of Gaze Bias in a Perceptual Discrimination Task.

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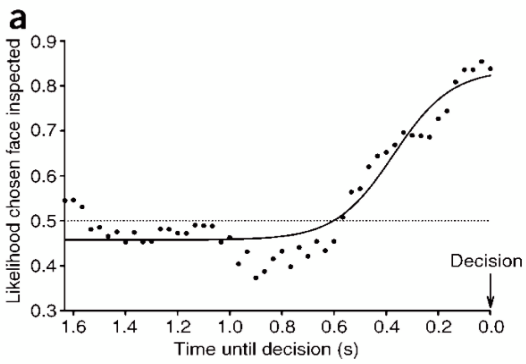
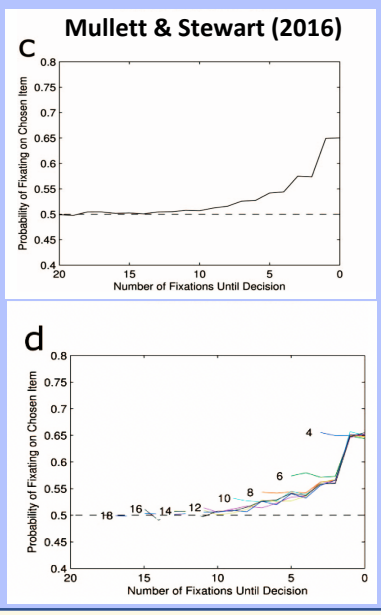
Background

Shimojo et al. (2003)



While making a decision, the likelihood of inspecting the eventually chosen option increases in the moments leading up to choice. One explanation of this finding is that it reflects a feedback loop that consists of two processes: evaluation and orienting. We initially orient towards a preferred item, and, as we continue to do so, the probability of sampling further favourable evidence increases.

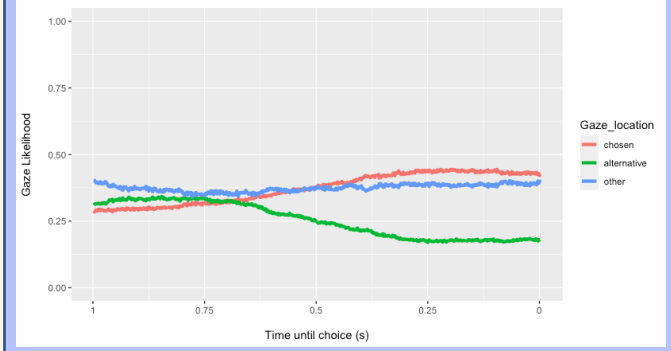
Mullett & Stewart (2016)



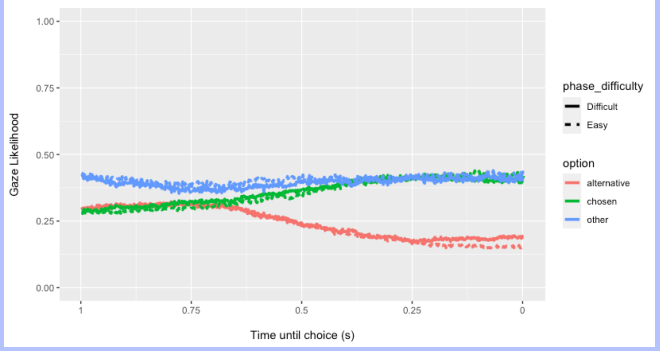
Mullett & Stewart (2016) have shown that a loop is not necessary to produce the gaze bias effect. They use a relative threshold model in which attention varies **randomly** between the options, and evidence accumulation is biased towards the attended item. The model simulations show that such a model can produce the gaze bias effect. A decision threshold is more likely to be reached after a series of consecutive fixations on the preferred item. By locking the analysis at the point at which choice is made, there appears to be a rise in the likelihood of inspecting the chosen option.

Method. **In our study, we investigate whether decision difficulty can affect the development of the gaze bias in a perceptual discrimination task. We might expect such influence to occur under the account in which the process of evaluation affects the allocation of attention.**

1. Gaze Likelihood, trial data aligned at choice



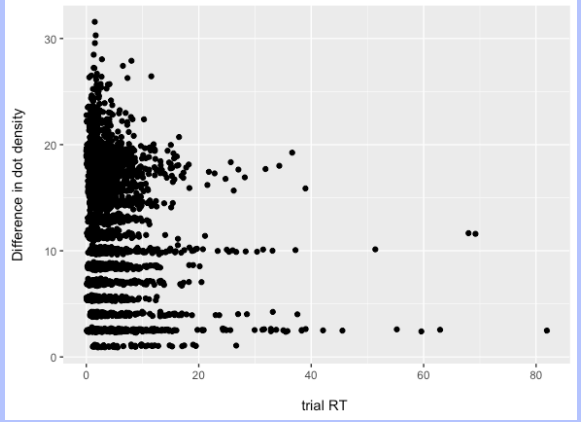
2. Gaze Likelihood by Phase Difficulty



Results. Our results replicate the gaze bias effect (Figure 1). The bias emerges within the last second before making a choice.

Figure 2 shows that there is very little or no difference in the time course of the bias depending on choice difficulty.

3. Trial RT & Choice Difficulty



4. Trial RT & Gaze Bias Duration

r = .243

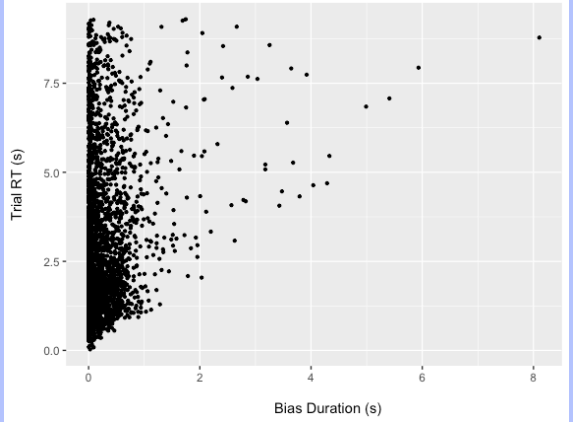


Figure 3 shows that there is a negative relationship between the trial RT and the difference in dot density between the two patterns.
Figure 4 shows that there is a weak relationship between the duration of gaze bias and the total trial time.

These analyses indicate that reaction times were affected by choice difficulty, but the duration of gaze bias did not strongly correlate with RTs. This invariance in the time course of gaze bias might indicate that evaluation difficulty does not affect allocation of attention.