

INTRODUCTION

Visual attention causally influences choices.

- An increase in the relative attention received by a desirable option increases the frequency with which it is chosen [1–3].

We do not know if visual attention influences choices between losses in the same way that it influences choices between gains.

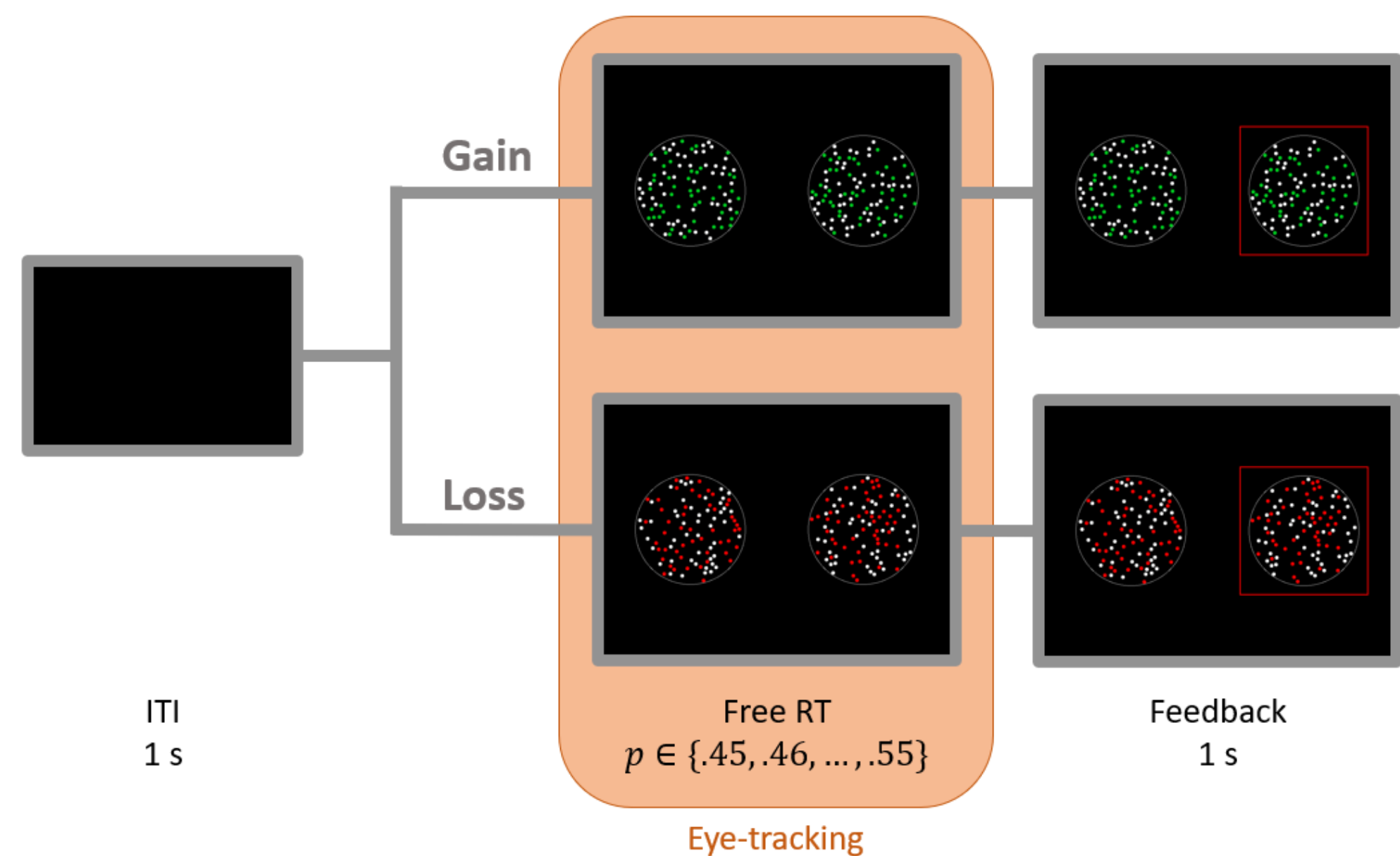
- Attention to appetitive snacks increases the tendency to overweight the value of fixated options [4–7].
- Attention to the positive outcome of a gamble increases with its probability and amount [8].

How does visual attention impact choices between negative-outcome lotteries?

- H0:** \uparrow relative attention to option $\Rightarrow \downarrow$ choice frequency. Attentional over-weighting of fixated option.
- H1:** \uparrow rel. attention $\Rightarrow \uparrow$ choice freq. Attentional under-weighting of fixated option.

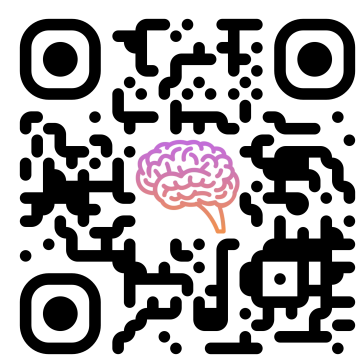
EYE-TRACKING TASK

- $N = 25$. Binary choices between lotteries.
- 400 trials, 2 blocks, 2 conditions:
 - Gain: positive-outcome lotteries.
 - Loss: negative-outcome lotteries.



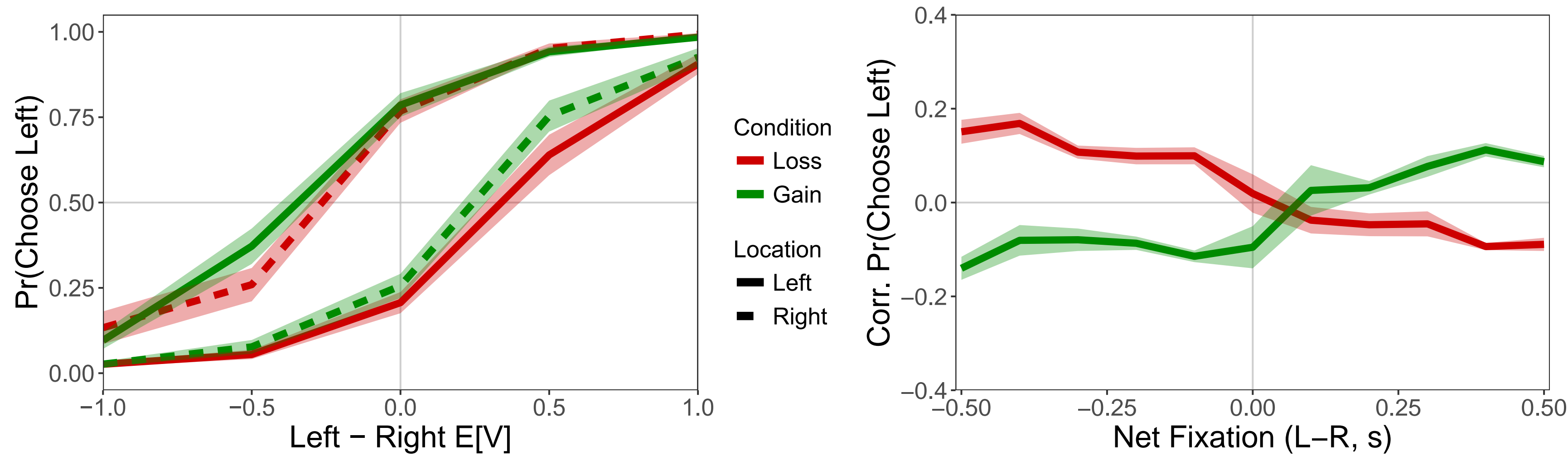
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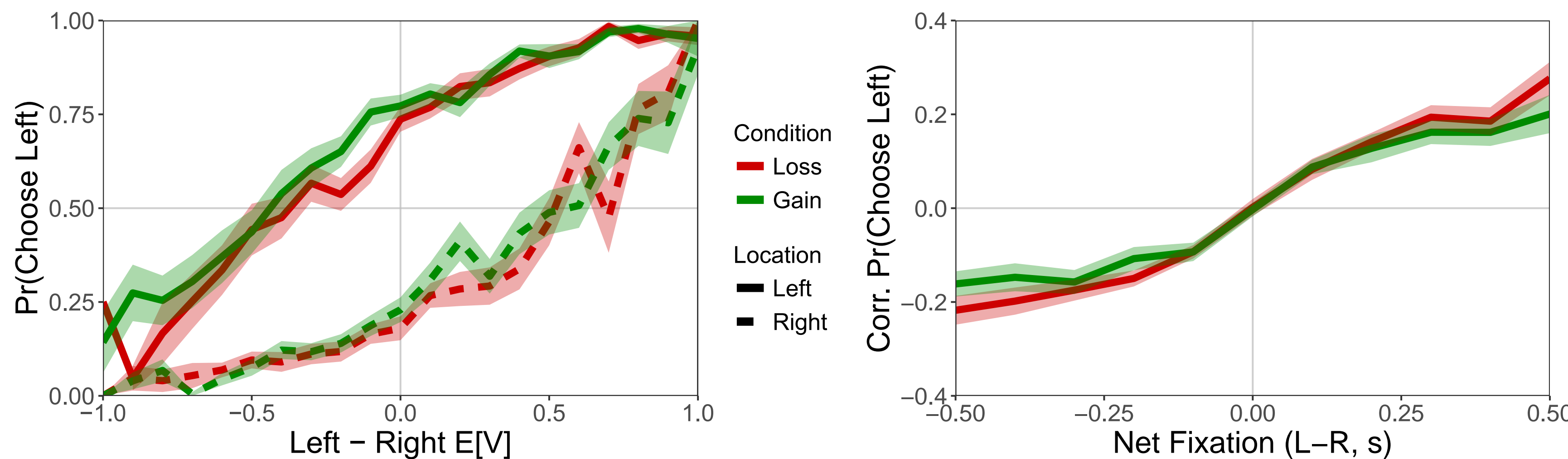


RESULTS

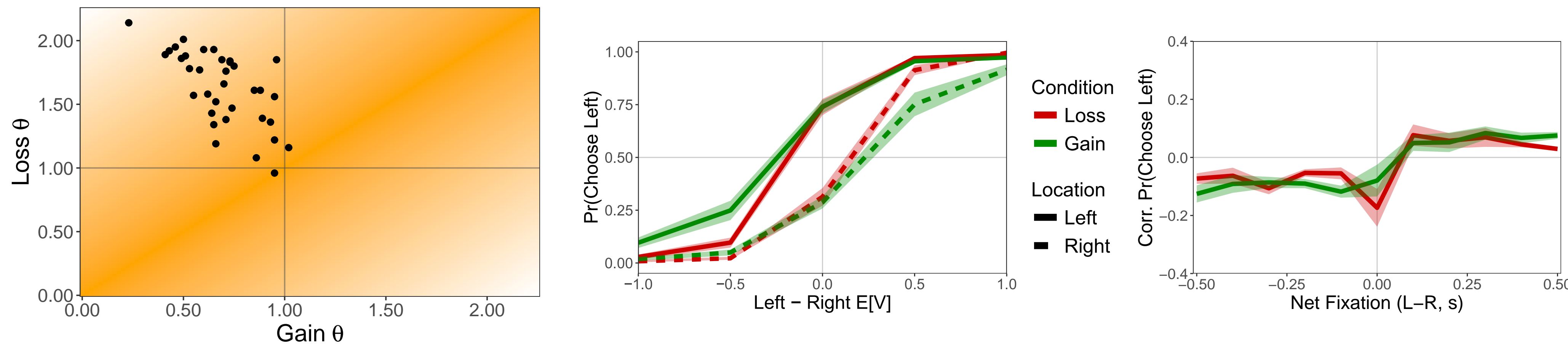
Model Predictions If there is attentional discounting in loss choices ($\theta_{loss} \in (0, 1)$), then an increase in the relative attention received by an option should decrease the frequency with which it is chosen.



Observed Data Instead, we find that an increase in the relative attention received by an option still increases the frequency with which it is chosen, just as in gains.



aDDM Observed data is explained by attentional amplification in the aDDM ($\theta > 1$) in choices between losses and attentional discounting ($\theta \in (0, 1)$) in choices between gains.



Hypotheses

H0: \uparrow rel. attention $\Rightarrow \downarrow$ choice freq., over-weighting in loss. (Results, Observed Data)	UNSUPPORTED
H1: \uparrow rel. attention $\Rightarrow \uparrow$ choice freq., under-weighting in loss. (Results, aDDM)	SUPPORTED

MODEL

Attentional Drift-Diffusion-Model (aDDM)

$$\text{Evidence}_t = \text{Evidence}_{t-1} + \mu_t + \epsilon_t$$

- Fixated left: $\mu_t = d(V_L - \theta V_R)$.
- Fixated right: $\mu_t = d(\theta V_L - V_R)$.
- Drift rate: d .
- Noise: $\epsilon_t \sim N(0, \sigma^2)$.
- Attentional discounting: $\theta \in (0, 1)$.
- Attentional amplification: $\theta > 1$.
- Evidence accumulation to decision bounds fixed at ± 1 .

DISCUSSION

Choices and response times can be captured by an aDDM using an attentional bias parameter that over-weights the value of the fixated option in gains ($\theta \in (0, 1)$) and under-weights this value in losses ($\theta > 1$). Potential explanations:

- There is a fundamental difference in the role of attention in gains versus losses.
- Subj. may be treating the task as a perceptual task by counting green dots in gains, white dots in losses, and making value comparisons based on these counts. Then attentional over-weighting explains all results.

Next steps:

7.6	11.4	-8.5	-11.3
67%	41%	25%	13%

REFERENCES

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