



Proskurin, Manakov and Karpova, Figure 1- figure supplement 2

Proskurin, Manakov and Karpova, Figure 1- figure supplement 2 | Deviations from the dominant sequence contain explorations of previously reinforced alternatives.

a. Example behavioral trace from an animal trained on 'LRLRLRR' (and 'LRLRR') sequence that has never experienced 'LLR' as a latent target. Blue: a rare 'LLR'

b. Distribution of local sequence prevalence values for the 'Left-Left-Right' sequence across animals in the '(LR)nR' group (left panel) and in deviations from the 'RRL' target in animals used in the present dataset (right panel). Note that if all deviations were mere errors of execution, we would expect to encounter 'LLR's in animals trained on (LR)nR with bout frequency that is on par with what we see in the dataset in this manuscript.

c. Example behavioral trace from an animal that acquired efficiency on 'LLLR' / 'RRRL' task after initial training on 'LLR' / 'RRL'. Note a pronounced bias in favor of longer sequences in the exploratory bout (blue).

d. Probability of 'LLLR' (or 'RRRL') in an off-target context before and after experience with 'LLLR' / 'RRRL' as targets.

e. Side-to-center time vs within- side-port time distribution for all dominant sequence instances, for which reward was omitted. **(left panel)** step one in the sequence. **(right panel)** step three in the sequence. Note the conspicuous absence of short durations for the third sequence step (arrowhead).

f. Example behavioral trace from an animal that never experienced reward omission (ie the dominant sequence was always rewarded with 100% reliability) highlighting a mid-block transient exploratory bout.

g. Distribution of local sequence prevalence values for the 'Left-Left-Right' and 'Right-Right-Left' sequences across all dominant and exploratory instances in the dataset from the subset of the implanted animals that never experienced reward omission.

h. Example behavioral trace from an animal that experienced omission throughout training highlighting non omission-triggered exploration.

i. Omission rate as a function of distance from exploratory bout onset.