
Supplementary information

A multidimensional distributional map of future reward in dopamine neurons

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Supplementary table 1

Animal	Session identity	Number of photo-ided neurons
3353	A	4
3353	B	3
3353	C	1
3353	D	4
3353	E	5
4098	A	1
4098	B	2
4098	C	6
4098	D	1
4098	E	2
4099	A	3
4099	B	1
4096	A	1
4140	A	1
4140	B	2
4140	C	1
4140	D	1
4418	A	1
4418	B	1
4418	C	1
4418	D	1

Testing the influence of number of experienced delays on estimated temporal discounts

We note that five cells possessed estimated discount factors that were greater than, and with 99% confidence intervals that were non-inclusive of, one. This may reflect limitations due to the number of reward delays that were probed, since three of these neurons were recorded in the absence of the 0 s reward delay condition. To assess whether this was the case, we substituted the response to the fixed rewards at trial offset for the 0 s delayed reward in these cells with the responses to the most unpredictable reward (at the longest delay of 6 s), an underestimate of the responses to the missing delay, and calculated the temporal discounts for each neuron. Under this substitution procedure, we obtained temporal discount factors that do not significantly differ from one (Ext. Data Fig. 5D-F). For completeness we include these neurons in all analyses.

Testing the adaptation of temporal discount factors to changes in reward time statistics

In addition to testing if the update in temporal discount when removing the shortest or longest delay is different over neurons, we also tested the direction of these changes.

- When removing the longest delay, we tested whether the change in temporal discount factors was negative across neurons: one-tailed $p = 0.04$, with a 95% CI = $(-0.34, -0.0070)$, based on $n=10,000$ bootstrap samples.
- When removing the shortest delay, we tested whether the change in temporal discount factors was positive across neurons: one-tailed $p = 0.3$, with a 95% CI = $(-0.07, 0.22)$, based on $n=10,000$ bootstrap samples.