Supplementary Figures:

a Familiarization with default patch

b Exposure to changes in patches
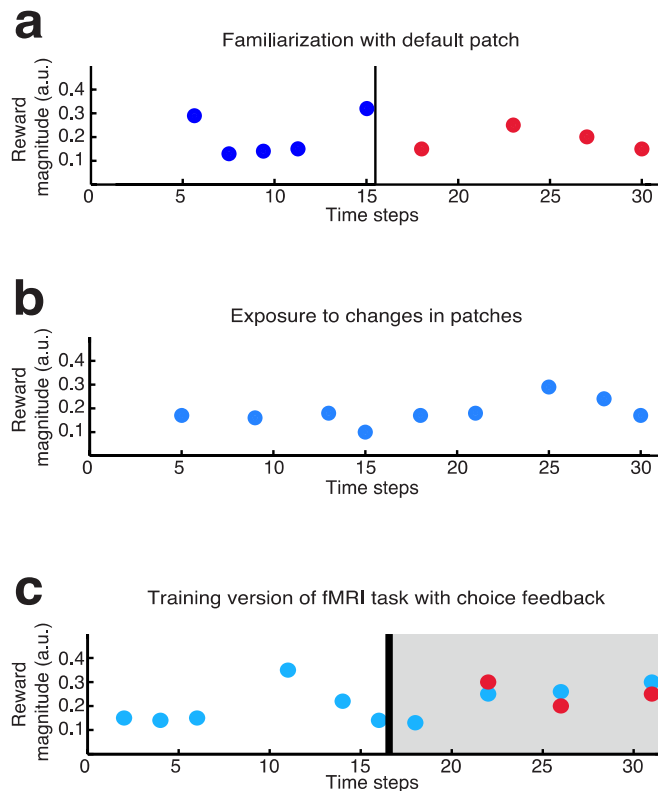

c Training version of fMRI task with choice feedback

Supplementary Figure 1. Supplementary task description relating to Figure 1. Illustration of the training schedule prior to fMRI scanning. Subjects were trained on the day before fMRI scanning and on the day of scanning, immediately preceding the experiment. The full training session (only performed on the preceding day) comprised three parts. (**a**) Familiarization with default patch (10 trials). In each trial, alternatingly, subjects experienced a stable default patch (red) and length-matched experimental patch (blue). Dots represent reward events of a given reward magnitude and the vertical line represents the cued transition to the other patch. After both patches (i.e. after time step 30), subjects were asked to indicate which environment had contained more rewards (i.e. had the overall higher reward rate). (**b**) In part two, subjects experienced three patches. They were told that a patch's payoff changed monotonically and that this becomes apparent when paying attention to both the reward magnitudes and reward delays of reward events. Subjects pressed through each patch three times with varying instructions. The instructions were to pay attention to 1) the change in reward magnitudes (ignoring delays) 2) the change of reward delays (ignoring reward magnitudes) and 3) the change in both magnitudes and delay. This part contained no decision. The reward sequence displayed in (b) was taken from an increasing reward rate curve (note the increasing payoff of the reward magnitude to reward delay ratio: the reward magnitudes increase and/or the delays between rewards decrease). (**c**) In the third part, subjects were asked to do a training version of the experimental task including leave-stay decisions (18 trials). Notably, they had the chance to experience the experimental patch (blue) or the default patch (red – this was only presented after the LSD when participants opted for the default option) and they were given performance feedback after each trial. The vertical line represents the time of the LSD and dots in the grey area represent reward events from the experimental patch (blue) and the default patch (red). Subjects experienced only one or the other on any given trial. For performance feedback, subjects were told how many bonus points they had earned or missed depending on their choice (see Experimental Procedures). Bonus points were proportional to the overall payoff of the chosen compared to the unchosen patch after LSD. Hence, a positive number indicated a correct choice (earned points) and a negative number an incorrect choice (points missed). This step allowed subjects to discern which aspects of the reward environment were predictive of correct choices. The reward sequence displayed was taken from a slightly decreasing reward curve (note the decreasing payoff of the reward magnitude to reward delay ratio: the reward magnitudes decrease and/or the delays between rewards increase). (**a,b,c**) In sum, the training session gave subjects the opportunity to memorize the

Assume
1) A,B,C
2) A, B, C
3) A,B,C

stable default patch, to grasp the structure of the reward environments and to learn how to make correct decisions. On the day of scanning, a shorter training session took place to refresh the experimental instructions. In the fMRI scanner, subjects had no opportunity to learn from direct choice feedback and 66% of trials were truncated after the leave-stay decision, discouraging changes in choice strategy during the fMRI session.