

Context-Induced Relapse to Alcohol Seeking After Punishment in a Rat Model

Supplemental Information

Apparatus

For the home-cage access phase (Fig. 1A), the alcohol solution was presented in standard water bottles. Solutions were prepared in tap water from 100% (v / v) ethanol (The Warner-Garden Co). For the self-administration phase, we used standard operant chambers located inside sound-attenuating cabinets (Med Associates). Each chamber was equipped with two levers located 8.5 cm above the grid floor, and the grid floors were connected to electric shock generators. Alcohol (0.1 ml/delivery) was delivered into a standard food receptacle (4.5 ml) that had a 12-gauge blunt needle attached to it; the needle was connected via PE tubing to a 60-ml syringe controlled by a Razel infusion pump (Razel Scientific Instruments). Total alcohol solution per session was calculated by multiplying the number of infusions by the infusion volume (0.1 ml) minus the solution left in the receptacle.

Two different contexts were provided by two sets of operant chambers. In one context, the cabinet doors were closed during the session, a white houselight provided illumination, a fan was turned on, the floor consisted of 19 stainless-steel rods (4.8 mm diameter) spaced 16 mm apart, and there was an empty feeder in the chamber. In the second context, the doors of the sound-attenuating cabinet remained open during the session, illumination was provided by a red houselight, the fan was turned off, the floor consisted of 26 stainless-steel rods (3.2 mm diameter) spaced 11 mm apart, and there was no feeder in the chamber. The contexts are referred to as A and B, where A is the context in which alcohol self-administration occurred, and B is the alternative context. The physical environments that provided contexts A and B were counterbalanced.

Table S1. Mean \pm SEM inactive lever presses per session for each group during the different phases of the experiment.

Exp. Phase	Group			
	Unpunished	Non-Contingent	Punished	Extinction
FR-1	1.4 \pm 0.6	2.5 \pm 1.7	1.4 \pm 0.4	2.5 \pm 0.9
FR-5	1.3 \pm 0.5	2.0 \pm 1.0	1.3 \pm 0.4	2.2 \pm 0.8
VI-30	1.1 \pm 0.5	1.4 \pm 0.7	0.9 \pm 0.2	2.2 \pm 0.8
Context B	3.0 \pm 1.2	3.9 \pm 1.1	2.3 \pm 0.7	2.6 \pm 1.0
Test A	1.0 \pm 0.6	0.5 \pm 0.4	0.3 \pm 0.1	1.6 \pm 0.6
Test B	0.7 \pm 0.5	1.1 \pm 0.8	0.9 \pm 0.4	0.4 \pm 0.4

Exp. Experiment; FR-1, fixed ratio 1; FR-5, fixed ratio 5; VI-30, variable-interval 30-sec.

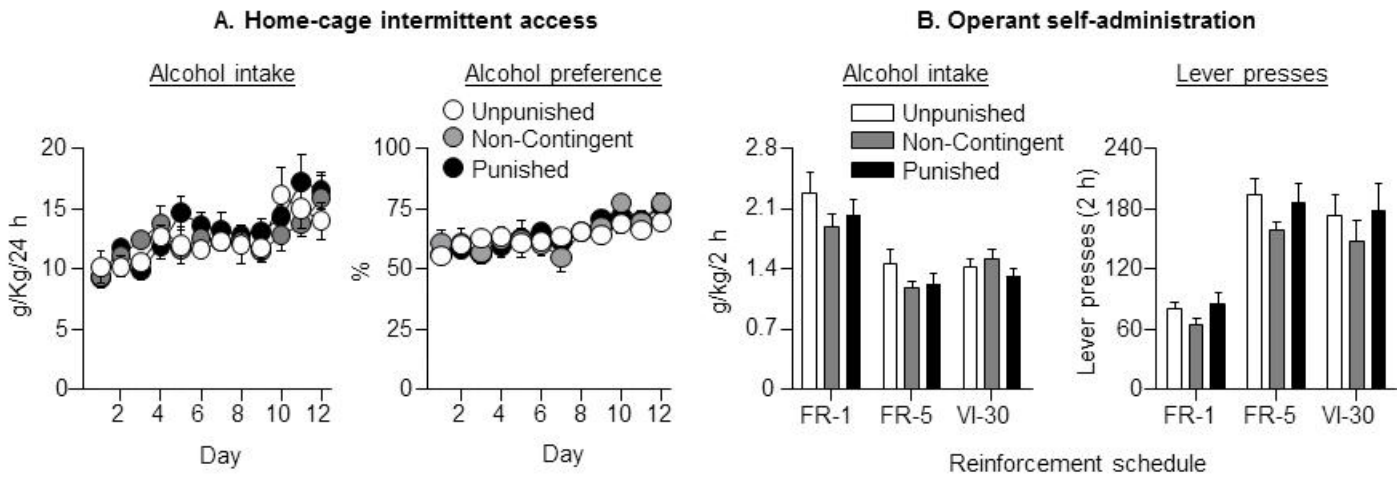


Figure S1. Intermittent free-choice home-cage access to 20% alcohol leads to high alcohol intake and reliable acquisition of operant self-administration in the three experimental groups in Experiment 1. **(A)** Mean \pm SEM alcohol intake in g/kg (left panel) and preference for 20% alcohol over water (right panel) during the 12 sessions of free-choice home-cage access to 20% alcohol. **(B)** Mean \pm SEM alcohol intake in g/kg (left panel) and active lever-presses (right panel) during the three different 20% alcohol self-administration schedules: FR-1, 3 sessions, FR-5, 4 sessions, VI-30, 4 sessions (Punished group, $n = 15$; Unpunished group, $n = 11$, Non-contingent shock group, $n = 8$). FR-1, fixed ratio 1; FR-5, fixed ratio 5; VI-30, variable-interval 30-sec.