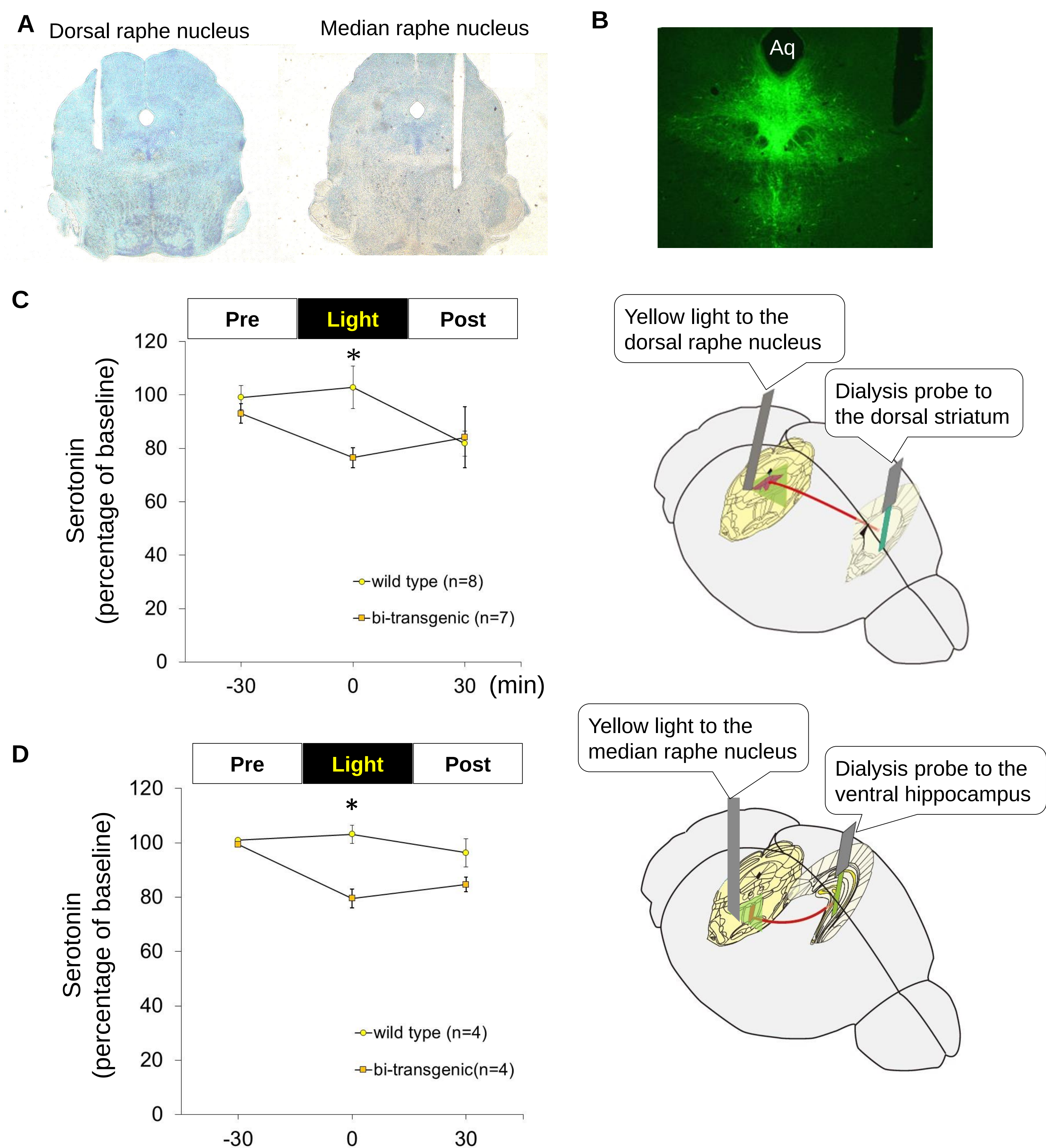




HOKKAIDO UNIVERSITY

Title	Disruption of model-based decision making by silencing of serotonin neurons in the dorsal raphe nucleus
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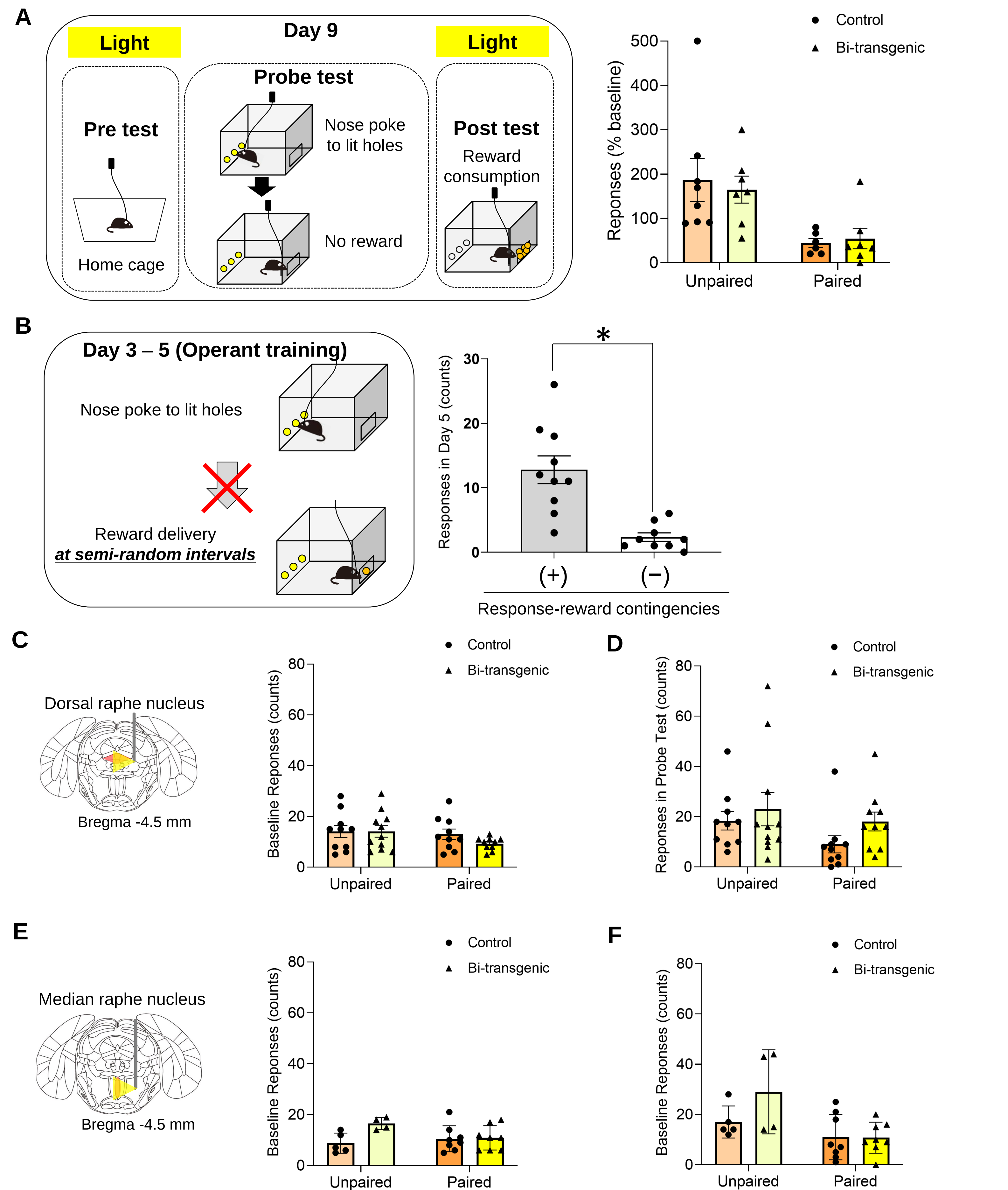


Figure S2. Control experiments and actual number of responses in the outcome devaluation task. Related to Figure 2. (A) Pre-test light application to the dorsal raphe nucleus for 15 min did not reverse suppressed responses in the paired lithium injection group during the probe test (genotype $\times$ paired/unpaired interaction effect, $F_{1,24} = 0.22$, $P = 0.65$; a main effect of paired/unpaired injection, $F_{1,24} = 13.50$, $P = 0.0012$). **(B)** A nose poke response resulted in a reward delivery in a group of mice (+) (see Figure 2A), while responses did not result in reward deliveries, but rewards were delivered at semi-random intervals in another group of mice (-). The latter group failed to develop nose poke responding to lit holes ($t_{10,71} = 4.66$, $p = 0.0007$). **(C)** The number of baseline responses in Day 5 (see Figures 2A and 2C). **(D)** The number of responses in the probe test of Day 9 (see Figures 2A and 2C). **(E)** The number of baseline responses in Day 5 (see Figures 2A and 2E). **(F)** The number of responses in the probe test of Day 9 (see Figures 2A and 2E). The data are presented as the means $\pm$ standard error of the mean.

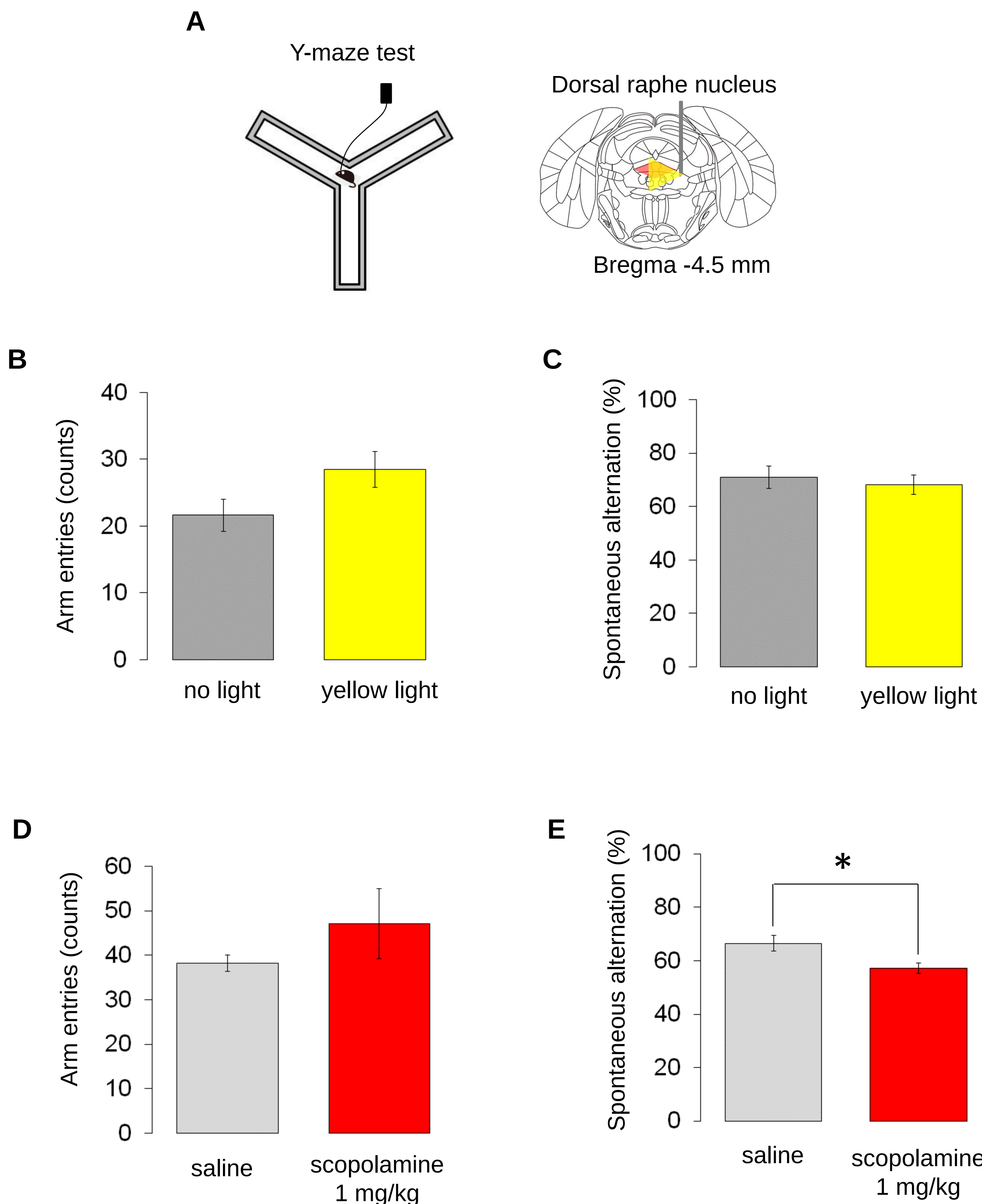
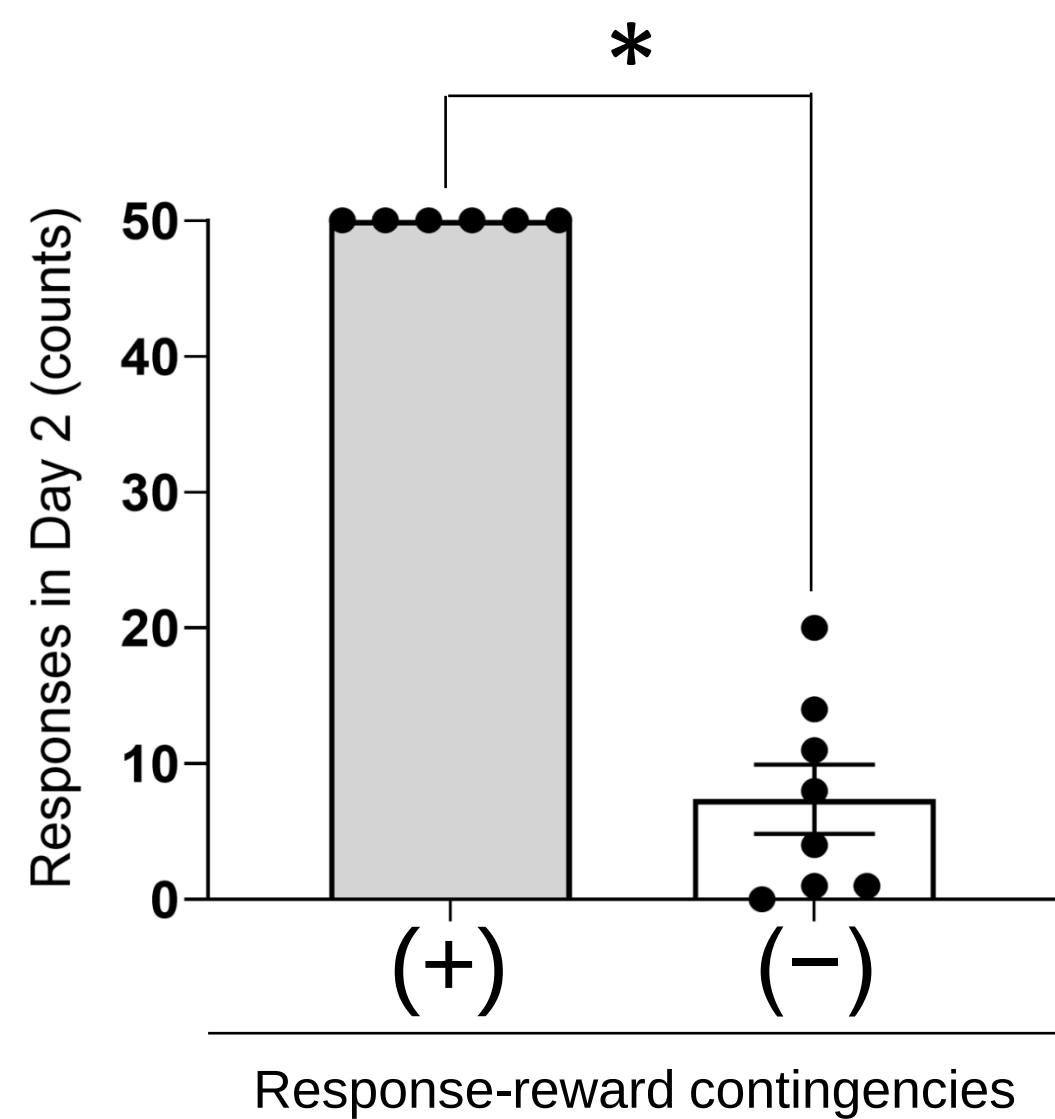
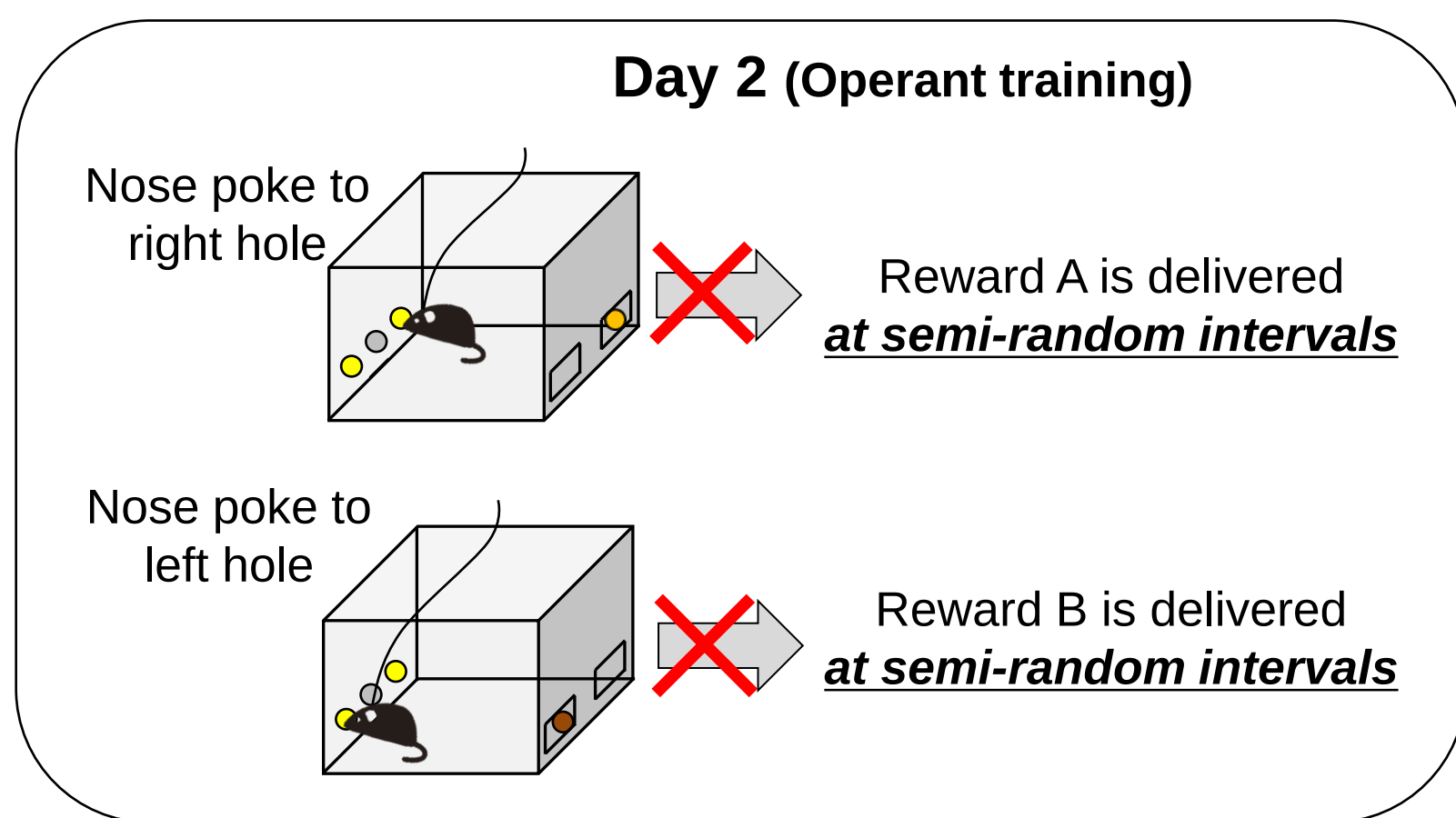


Figure S3. Effects of the inhibition of serotonin neurons on Y-maze performance and pharmacological validation of the Y-maze test. Related to Figures 2, 3, and 4.

(A) Bi-transgenic mice ($n = 8$) received continuous yellow light applications to the dorsal raphe nucleus during the Y-maze test. Yellow light application to the dorsal raphe nucleus did not affect (B) the number of entries into arms, a measure of locomotor activity ($t_7 = 1.79$, $P = 0.12$), or (C) the percentage of spontaneous alternation, a measure of working memory ($t_7 = 0.44$, $P = 0.67$). To check whether the Y-maze in our setup could detect working memory deficit, we injected saline or scopolamine (1 mg/kg, i.p.) to adult male (10-12 weeks old) wild type mice ($n = 7$) 1 hour before the test. (D) Scopolamine did not affect the number of entries into arms, a measure of locomotor activity ($t_6 = 1.16$, $P = 0.29$). (E) Scopolamine reduced the percentage of spontaneous alternation, a measure of working memory ($t_6 = 2.84$, $P = 0.03$). The data are presented as the means $\pm$ standard error of the mean. * $P < .05$.

A



B

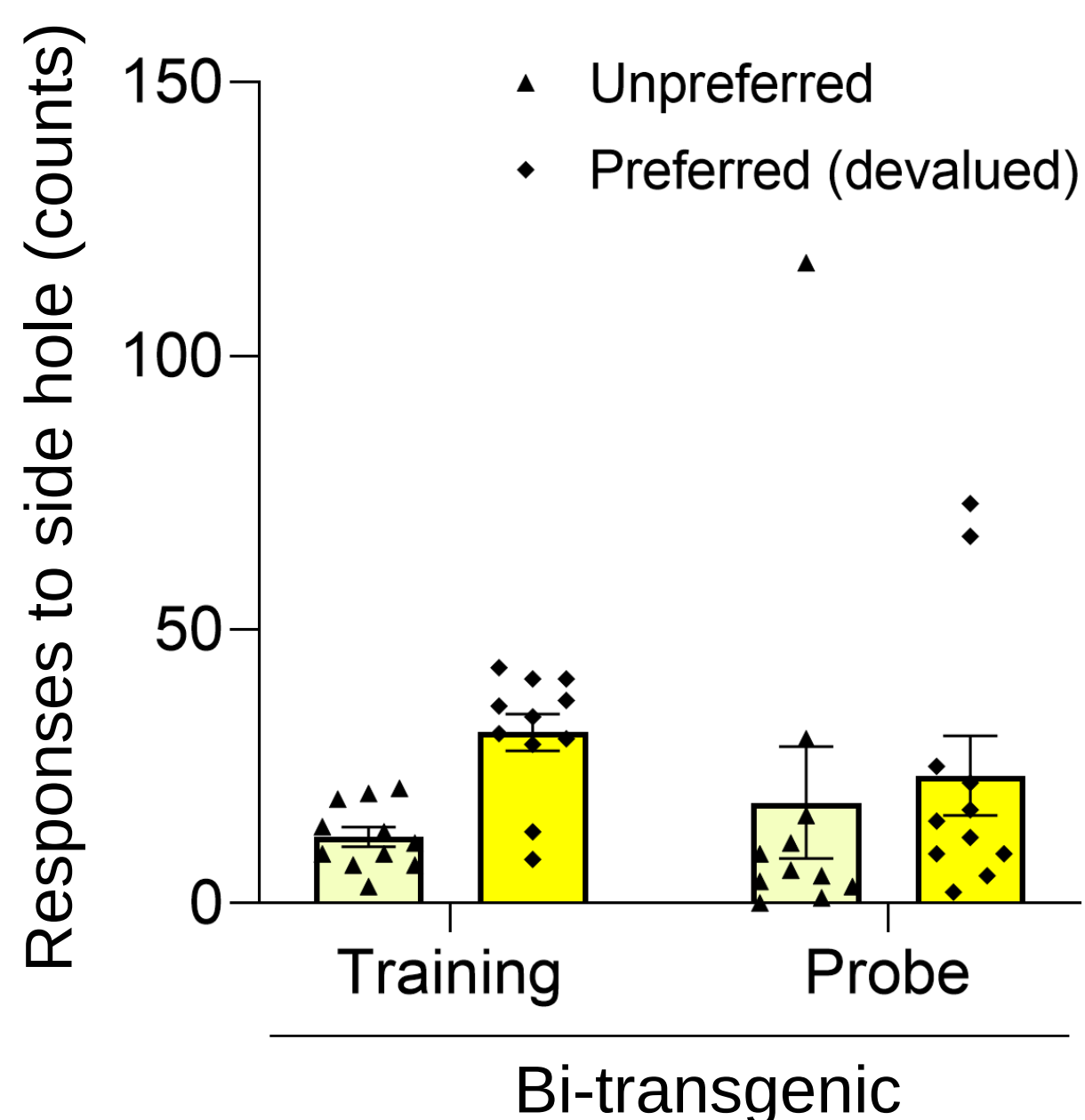
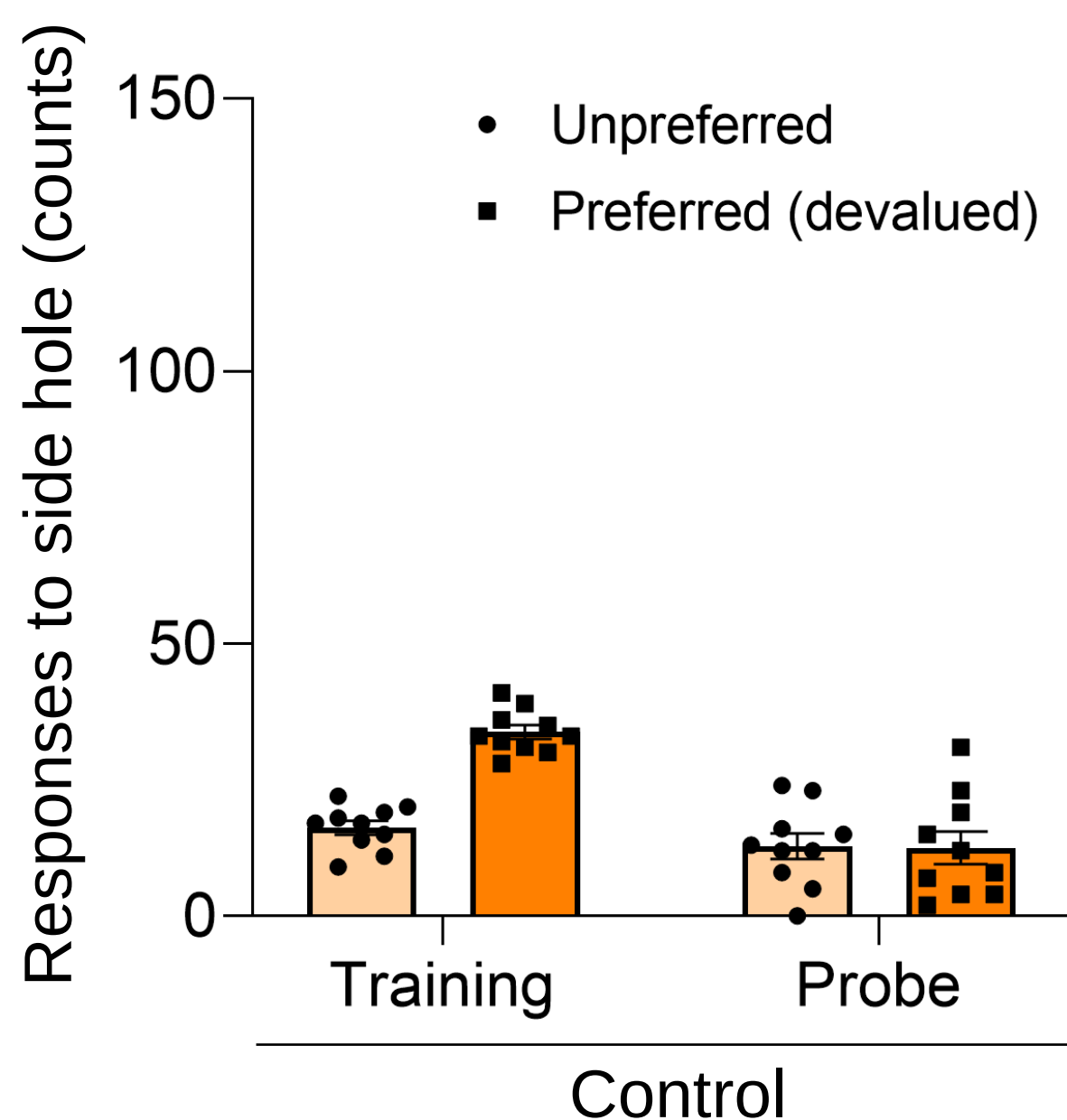


Figure S4. Response-reward non-contingency control experiment and actual numbers of responses in the reward-specific outcome devaluation task. Related to Figure 4. (A) A nose poke response to the right or left hole resulted in a reward delivery in a group of mice (+) (see Figure 4A), while responses did not result in reward deliveries, but rewards were delivered at semi-random intervals in another group of mice (-). The latter group failed to develop nose poke responding to right and left holes. Because all the value in the former group are identical, we used one-sample Wilcoxon test ($W = -36.0$, $p = 0.0078$). **(B)** The actual numbers of responses during the training (Day 2) and probe tests (Day 5) of the reward-specific outcome devaluation task (see Figures 4A and 4C). The data are presented as the means $\pm$ standard error of the mean. $*P < .05$.