Supplemental figure captions

Figure S1

Type 2 neuron firing patterns and their proportions in different subregions. Average firing rate with standard error of the mean (light gray) is shown in PETHs around the onset of sucrose availability (vertical dashed line) for each of the 6 subregions (100 ms bin size). The number of each neuron type recorded is indicated in the upper left corner of each PETH, and the dark area in the pie chart next to each PETH represents the fraction of Type 2 neurons of the total number of neurons in that subregion. The availability of sucrose is indicated by the vertical gray bar (randomized between 1, 1.5 and 2 s in each trial).

Figure S2

Perievent time histograms (PETHs) of average firing rate of Type 1 neurons (green, ordinate on the left side of each panel) and average lick rate (black, ordinate on the right side of each panel) for each subregion (200 ms bin size). The PETHs are constructed around lick onset (left row), sucrose offset (middle row), and the last lick in each trial before the 5-s timeout period started (right row). The onset of sucrose delivery is identical to the first lick. Time indicated on the bottom panels applies to all panels.

Figure S3

Perievent time histograms (PETHs) of average firing rate of Type 2 neurons (blue, ordinate on the left side of each panel) and average lick rate (black, ordinate on the right side of each panel) for each subregion (200 ms bin size). Plots are identical as the ones shown in figure S2.

Figure S4

PETHs of average lick rate and time to half-maximal lick inhibition for different intensities during bilateral stimulation (50 ms bin size). Mean lick rate shown in black with standard error of the mean indicated in light gray. Stimulation was delivered from 1 to 2 s (black dashed vertical lines). For the purpose of clarity sucrose availability is not indicated, but sucrose was available from 0 to 3 s. Time intervals indicated on the bottom panels applies to all panels. Stimulation was delivered either at 15 Hz with each stimulus lasting 100 μs (left row), or 15 Hz with each

stimulus lasting 200 µs (middle row), or 40 Hz with each stimulus lasting 200 µs (right row). Four stimulation current intensities were tested for each condition (denoted on the left side of the figure). The time course of lick rate reduction around stimulation onset (red) and lick rate recovery around offset (blue) was modeled using a sigmoid regression. The time elapsed from stimulation onset to half-maximal reduction of the lick rate is indicated by a red dashed line and denoted in the upper right corner of each panel (red). Similarly, the time elapsed from stimulation offset to half-maximal recovery of the lick rate is indicated by a blue dashed line and denoted in the upper right corner of each panel (blue). No values are reported if the half-maximal effect could not be assessed using our model.

Figure S5

Representative examples of stimulation-lick disruption relationships are shown for each stimulation electrode pair in one rat. Four stimulation electrode pairs were implanted in each hemisphere (left: upper row; right: lower row). Electrodes were arranged along the rostro-caudal axis (1×8 array) indicated only in the first plot. On top of each panel the sink (anode, red) and source (black) are indicated (gray circles denote electrodes not used in the experiment). Gray dots in the lick rate plots denote the number of licks per second for individual trials at a given stimulus intensity, and the black dots represent the average number of licks of all trials at that intensity. Licks were measured from 0.3-1.3 s after stimulation train onset (see Materials and Methods for details). Regression lines of a robust (green) and a least squares linear fit (magenta) are shown. We used the absolute slope of the robust fit as a measure for the efficacy of stimulation-induced lick disruption (rounded here for illustrative purposes) and normalized the reduction of lick rate per 100 µA stimulation current. In all cases the stimulus train frequency was 15 Hz for 1 s, and individual stimuli lasted 200 µs. Representative lick data of effective (red frame) and ineffective (blue frame) stimulation sites are shown for individual trials in supplemental figures S6 and S7, respectively. Note that effective sites could be close to ineffective sites.

Figure S6

Individual lick responses time-locked to lick onset for a pair of stimulation electrodes located in a region where stimulation caused lick disruption. Each panel represents a 6-s epoch of one trial (vertical number) with the stimulation current indicated above each panel. Epochs are sorted by ascending stimulation current. The light gray area indicates sucrose availability (4 s). Black

vertical lines in the upper row of each panel represent individual licks, while red vertical lines in the lower row represent individual stimuli during the train. Stimulation was always delivered at 15 Hz with 200 μs duration for individual stimuli, and train duration was 1 s. The time of the stimulation train onset was pseudo-random. The stimulation train was not trigged if licking frequency was below 6.25 Hz (denoted as “stimulation omitted”).

Figure S7

Individual lick responses time-locked to lick onset for a pair of stimulation electrodes located in a region where stimulation did not cause lick disruption. Stimulation parameters and experimental conditions are identical to those described in the legend for supplemental figure S6. During trial # 42 the stimulus current could not be passed by the stimulator. This happened at higher stimulation current intensities, and is denoted as “error”.