**Supplementary Note**

**Whisker Stimulations**

The stimuli were applied to groups of up to 4 whiskers on a single vibrissae arc, at ~1 cm from the rat’s face.

**State-sorting**

Sorting of O-trials from NO-trials was based on 9 Hz power averaged over 3 pre-stimulus bins, centered at 250 ms before the stimulus, from a spectrogram calculated with 512 FFT points, sampling frequency = 1000 Hz, Hanning window = 512 ms, noverlap = 462 ms.

Although all rats exhibited 7-12 Hz oscillations during awake immobility, the incidence and amplitude of recorded 7-12 Hz oscillations varied from rat to rat. This is expected, given that electrodes cannot be placed in the exact same locations in the S1 cortex for each animal. Moreover, variations in electrode quality (e.g. impedance) and the brain’s immunological response to the implants mean that the signal amplitude as well as signal to noise ratio can vary from rat to rat. Therefore each rat will have a different effective threshold for the oscillatory state.

To set each rat’s threshold, an experimenter compared the LFP in single trials to the 9 Hz power profile for each trial, in order to estimate a 9 Hz power threshold for the oscillatory state. Because the oscillatory state is clearly discernable from the raw LFP trace (as in Figure 1B), we could estimate that our 9 Hz power threshold criterion agreed with an experimenter’s visual judgment in about 95% of trials. It is important to point out that these oscillations are very clear and there is no way an experienced neurophysiologist could miss them.

**Supplementary Figures 1-3: First Session ERD**

To ascertain that the Event Related Desynchronization of the 7-12 Hz oscillations is not a learned effect, we checked that ERD occurred in rats’ first session with the whisker stimulator. The following 3 figures show first-session ERD in average 9 Hz power (Supp. Figs. 1,2) and in single trials (Supp. Fig. 3).
Supplementary Figure 1: 1st session peri-stimulus 9 Hz power for oscillatory response trials (blue) and non-oscillatory response trials (red) for rat O1. Stimulus onset is just before t = 2 seconds.

Supplementary Figure 2: 1st session peri-stimulus 9 Hz power for oscillatory response trials (blue) and non-oscillatory response trials (red) for rat O3. Stimulus onset is just before t = 2 seconds.
Startle Responses

Occasionally, very fast responses evidenced by the peak around 30 ms in both histograms were observed (see red arrow in Fig 2A). More detailed analysis of the subjects’ behavior during these trials indicated that these fast responses represented startle (e.g. Koch M, Schnitzler H-U, Behav. Brain Res. 89 (1997) 35-49) movements of the jaw that were detected by the lickometer beam, rather than voluntary attempts to lick for reward. Omitting these very fast responses (< 40 ms) from the average latency calculations still led to no significant difference between the two conditions: 167 ± 3 ms in the oscillatory trials vs. 165 ± 2 ms in the non-oscillatory trials (p>0.5).

Response Dynamics

To determine whether habituation or learning affected response dynamics, sessions were divided into blocks of 40 trials. An unbalanced 1-way analysis of variance found that variations in the probability of responding p(resp), and in the probability of an oscillatory episode at stimulus time p(osc), were not statistically significant across within-session blocks of trials, or across sessions.
To further assess whether variations in responsiveness were affected by LFP synchronization state, we calculated correlation coefficients between p(resp) and p(osc). For eight rats, the mean across-session correlation coefficient was $-0.11 \pm 0.14$, with equal numbers of positive and negative values. A within-session block analysis found a mean correlation $-0.02 \pm 0.05$. Thus there was no significant effect of oscillatory state on the probability of responding ($p>0.5$).

Conversely, variations in responsiveness during the oscillatory state $p(\text{resp}|\text{osc})$ and during the non-oscillatory state $p(\text{resp}|\text{non-osc})$ were highly correlated, both within and across sessions. The eight-rat mean correlation coefficient for the across sessions variability was $0.84 \pm 0.06$. The within-session correlation coefficient mean was $0.63 \pm 0.1$, and the bootstrapped empirical $r$-distribution for each rat indicated that every rat’s correlation coefficient was significantly different from zero ($p<0.01$). These results suggest that responsiveness varies similarly in and out of the oscillatory state, arguing against the notion that the oscillatory state excludes perception or responding.