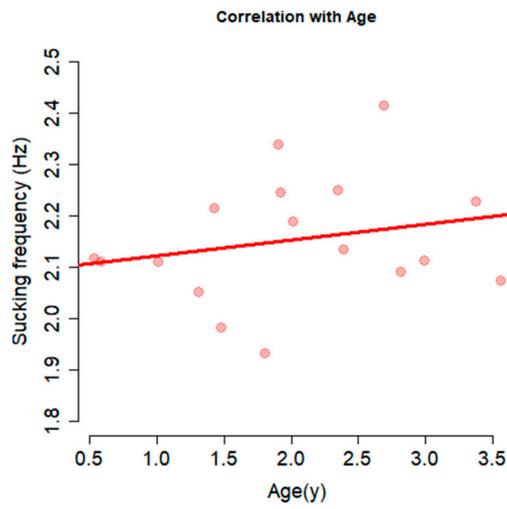
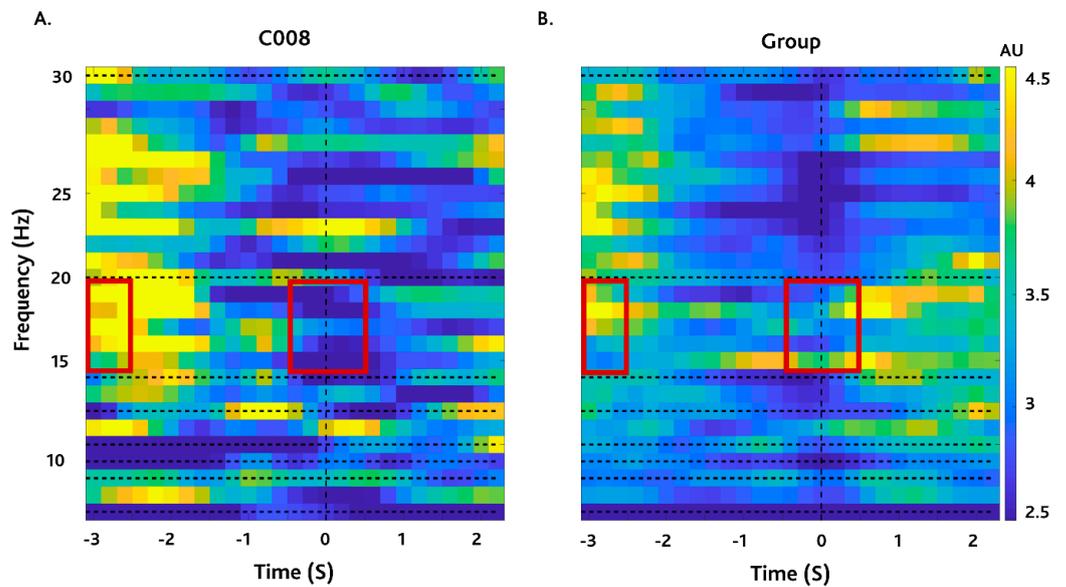


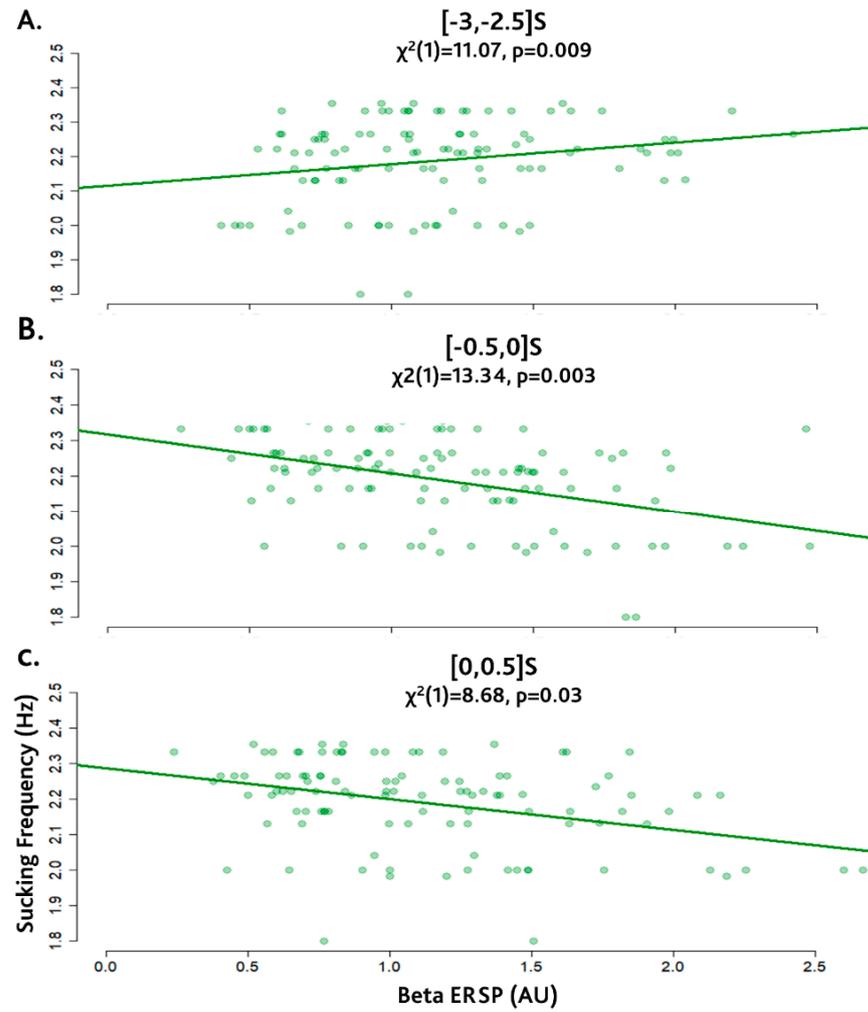
**Supplementary Materials:** The following supporting information can be downloaded at: [www.mdpi.com/xxx/s1](http://www.mdpi.com/xxx/s1).



**Figure S1.** Correlation of sucking frequency with age. No significant correlation was found between sucking frequency (Hz) and the subjects age (y),  $R^2=0.05$ ,  $p=0.4$ . Points represent individual subjects, while continuous line represents the best linear fit.



**Figure S2. Time-frequency plot.** x-axes represent time (S) and y-axes frequency (Hz). The red lines delimit the time-frequency bins resulted significant from the linear mixed model analyses. (A) Example of heat map obtained from typical subject (C008, age= 1.9). (B) Heat map that includes all subjects.



**Figure S3. Correlations for each time window.** Significant associations were found between relative beta ERSP (arbitrary units, AU) and sucking frequency (Hz). Each point represents a single trial, while continuous lines represent the best linear fit. (A), (B) and (C) show the associations in the significant time windows, respectively  $[-3,-2.5]S$ ,  $[-0.5,0]S$  and  $[0,0.5]S$ .

**Table S1.** Individual subject data. Individual subject data at different ages showing the specific non-nutritive sucking (NNS) frequency and relative power of mu and beta activity during baseline and sucking period.

Code	Fractional age	Biological Sex	SF (Hz)	Baseline relative power (%)			NNS relative power (%)		
				$\mu$ 1	$\mu$ 2	$\beta$	$\mu$ 1	$\mu$ 2	$\beta$
C001	0.53	M	2.12	0.6862	0.4086	0.2108	0.4570	0.2852	0.1113
C002	0.58	F	2.11	0.4403	0.3643	0.0977	0.4484	0.2318	0.1280
C003	1.01	F	2.11	0.5777	0.2641	0.1913	0.5195	0.2135	0.0981
C004	1.31	F	2.05	1.3126	0.3757	0.1634	1.5741	0.7329	0.1301
C005	1.43	F	2.22	4.0068	0.4753	0.2819	3.4500	0.3963	0.2161
C006	1.48	F	1.98	1.9150	0.8491	0.3739	0.5678	0.2857	0.1175
C007	1.80	M	1.93	1.7881	0.3942	0.2710	0.5215	0.2660	0.1148
C008	1.90	F	2.34	3.2554	0.8381	0.3822	3.7801	0.8326	0.3742
C009	1.92	M	2.25	1.5316	0.5621	0.1690	1.9951	0.9746	0.2386
C010	2.01	M	2.19	0.7811	0.3063	0.1382	1.1779	0.3390	0.1442
C011	2.35	M	2.25	1.3074	0.5039	0.3428	0.7736	0.3587	0.2283
C012	2.39	M	2.13	2.3704	0.4849	0.3376	4.5930	0.8096	0.3907
C013	2.69	M	2.41	5.5940	0.4866	0.1913	4.9814	0.8331	0.3641
C014	2.82	M	2.09	1.7985	0.7566	0.3534	1.5006	0.3924	0.1743
C015	2.99	M	2.11	2.3689	0.9839	0.3029	2.8824	1.7203	0.3129
C016	3.38	M	2.23	1.7705	0.7795	0.3834	0.9044	0.4201	0.2771
C017	3.56	M	2.07	1.2630	0.7858	0.3636	1.2456	0.7292	0.3113