

Supplementary Table 1. Correlation between a proxy for circulating estradiol levels and association bias, glides, transits, and gene (*neuroligin-3* and *tyrosine hydroxylase*) expression in different brain regions. ** indicates significance after correcting for multiple hypotheses; * indicates significance that does not survive multiple hypothesis testing

	LL		LS		SS		FF		HT	
	Correlation coefficient	p-value	Correlation coefficient	p-value	Correlation coefficient	p-value	Correlation coefficient	p-value	Correlation coefficient	p-value
Association Bias	-0.333	0.346	-0.018	0.959	-0.121	0.845	0.312	0.413	N/A	N/A
Glides	0.422	0.224	0.073	0.84	0.8	0.104	0.474	0.196	N/A	N/A
Transits	0.048	0.893	0.793	** (0.006)	-0.5	0.391	0.6	0.087	N/A	N/A
<i>Neuroligin-3</i>										
cb	-0.392	0.261	0.606	0.062	-0.286	0.64	-0.293	0.442	-0.756	0.139
DI	-0.288	0.419	0.234	0.515	-0.374	0.534	-0.507	0.162	0.237	0.7
Dm	-0.235	0.512	0.029	0.936	-0.229	0.71	-0.49	0.18	0.671	0.214
GC	-0.276	0.471	0.533	0.111	-0.161	0.795	-0.069	0.858	-0.583	0.301
HV	-0.391	0.263	0.321	0.364	-0.328	0.589	-0.355	0.347	-0.253	0.68
POA	-0.306	0.388	0.305	0.424	0.118	0.85	-0.411	0.271	0.7	0.187
TA	-0.443	0.198	0.359	0.307	-0.414	0.487	-0.327	0.389	-0.332	0.585
Vs	-0.416	0.231	0.285	0.424	0.114	0.855	-0.436	0.239	0.785	0.115
Vv	-0.392	0.262	0.417	0.23	-0.18	0.771	-0.45	0.223	-0.766	0.233
<i>Tyrosine Hydroxylase</i>										
OB	-0.327	0.389	-0.159	0.682	-0.432	0.466	-0.477	0.194	0.41	0.492
POA	-0.33	0.351	-0.376	0.318	-0.02	0.974	-0.218	0.571	0.013	0.982
TPp	-0.285	0.424	-0.015	0.967	0.019	0.975	0.056	0.885	0.633	0.251
PPv	-0.442	0.2	-0.015	0.966	-0.68	0.206	0.467	0.204	0.927	*(0.023)
PTN	-0.294	0.408	0.037	0.919	0.374	0.534	0.129	0.739	-0.088	0.887
Vc	-0.33	0.351	-0.119	0.759	-0.151	0.808	-0.349	0.356	0.163	0.792
Vv	0.329	0.352	-0.187	0.628	0.237	0.7	0.077	0.843	0.379	0.528

Supplementary Table 2. *Neurologin-3* optical density (mean \pm SE) comparisons between “high” (> median) and “low” (< median) glides and transits. ** indicates significance after correcting for multiple hypotheses; * indicates significance that does not survive multiple hypothesis testing; n.s., not significant

Brain Region	LL			LS			FF		
	High	Low	p-value	High	Low	p-value	High	Low	p-value
Glides									
Dm	0.012 \pm 0.001	0.031 \pm 0.085	n.s. (0.05)	0.024 \pm 0.009	0.041 \pm 0.015	n.s. (0.37)	0.024 \pm 0.014	0.026 \pm 0.01	n.s. (0.92)
DI	0.01 \pm 0.0003	0.028 \pm 0.01	n.s. (0.1)	0.018 \pm 0.005	0.027 \pm 0.008	n.s. (0.38)	0.019 \pm 0.009	0.019 \pm 0.006	n.s. (0.99)
Cb	0.042 \pm 0.014	0.074 \pm 0.028	n.s. (0.33)	0.081 \pm 0.03	0.05 \pm 0.014	n.s. (0.38)	0.082 \pm 0.035	0.038 \pm 0.011	n.s. (0.28)
GC	0.005 \pm 0.0008	0.007 \pm 0.002	n.s. (0.44)	0.006 \pm 0.002	0.005 \pm 0.0007	n.s. (0.57)	0.009 \pm 0.003	0.004 \pm 0.0004	n.s. (0.24)
POA	0.028 \pm 0.004	0.106 \pm 0.055	n.s. (0.19)	0.111 \pm 0.04	0.092 \pm 0.034	n.s. (0.75)	0.104 \pm 0.054	0.116 \pm 0.053	n.s. (0.88)
TA	0.026 \pm 0.011	0.077 \pm 0.036	n.s. (0.22)	0.066 \pm 0.017	0.066 \pm 0.012	n.s. (0.98)	0.1 \pm 0.034	0.065 \pm 0.03	n.s. (0.46)
VH	0.054 \pm 0.019	0.125 \pm 0.061	n.s. (0.31)	0.151 \pm 0.053	0.131 \pm 0.028	n.s. (0.75)	0.197 \pm 0.08	0.132 \pm 0.052	n.s. (0.52)
Vs	0.028 \pm 0.003	0.117 \pm 0.038	n.s. (0.05)	0.073 \pm 0.022	0.124 \pm 0.043	n.s. (0.33)	0.055 \pm 0.028	0.082 \pm 0.043	n.s. (0.63)
Vv	0.022 \pm 0.003	0.118 \pm 0.039	* (0.04)	0.072 \pm 0.028	0.084 \pm 0.014	n.s. (0.72)	0.06 \pm 0.04	0.086 \pm 0.043	n.s. (0.68)
Transits									
Dm	0.022 \pm 0.01	0.02 \pm 0.003	n.s. (0.8)	0.042 \pm 0.015	0.022 \pm 0.008	n.s. (0.31)	0.024 \pm 0.014	0.028 \pm 0.012	n.s. (0.84)
DI	0.024 \pm 0.011	0.014 \pm 0.002	n.s. (0.45)	0.03 \pm 0.007	0.016 \pm 0.004	n.s. (0.14)	0.019 \pm 0.009	0.024 \pm 0.011	n.s. (0.74)
Cb	0.083 \pm 0.027	0.033 \pm 0.009	n.s. (0.11)	0.098 \pm 0.025	0.033 \pm 0.01	* (0.04)	0.082 \pm 0.035	0.059 \pm 0.031	n.s. (0.63)
GC	0.006 \pm 0.001	0.006 \pm 0.002	n.s. (0.98)	0.006 \pm 0.002	0.004 \pm 0.0005	n.s. (0.3)	0.009 \pm 0.003	0.006 \pm 0.001	n.s. (0.48)
POA	0.098 \pm 0.058	0.037 \pm 0.005	n.s. (0.32)	0.13 \pm 0.039	0.081 \pm 0.033	n.s. (0.39)	0.104 \pm 0.054	0.089 \pm 0.034	n.s. (0.82)
TA	0.068 \pm 0.039	0.036 \pm 0.011	n.s. (0.46)	0.09 \pm 0.01	0.043 \pm 0.008	* (0.009)	0.1 \pm 0.034	0.058 \pm 0.024	n.s. (0.35)
VH	0.114 \pm 0.064	0.067 \pm 0.019	n.s. (0.5)	0.18 \pm 0.045	0.102 \pm 0.028	n.s. (0.18)	0.197 \pm 0.08	0.197 \pm 0.08	n.s. (0.67)
Vs	0.082 \pm 0.044	0.063 \pm 0.02	n.s. (0.71)	0.0135 \pm 0.042	0.062 \pm 0.015	n.s. (0.14)	0.055 \pm 0.028	0.058 \pm 0.024	n.s. (0.94)
Vv	0.079 \pm 0.045	0.061 \pm 0.022	n.s. (0.73)	0.101 \pm 0.022	0.055 \pm 0.016	n.s. (0.13)	0.06 \pm 0.041	0.061 \pm 0.029	n.s. (0.97)

Supplementary Table 3. *Tyrosine Hydroxylase* optical density (mean \pm SE) comparisons between “high” (> median) and “low” (< median) association bias. ** indicates significance after correcting for multiple hypotheses; * indicates significance that does not survive multiple hypothesis testing; n.s., not significant

Brain Region	LL				LS				FF			
	High	Low	t	p-value	High	Low	t	p-value	High	Low	t	p-value
OB	0.02 \pm 0.004	0.019 \pm 0.002	0.1	n.s. (0.88)	0.023 \pm 0.003	0.018 \pm 0.0008	1.4	n.s. (0.19)	0.018 \pm 0.001	0.022 \pm 0.004	- 0.7	n.s. (0.45)
Vv	0.01 \pm 0.004	0.011 \pm 0.004	-0.1	n.s. (0.89)	0.019 \pm 0.009	0.006 \pm 0.004	1.1	n.s. (0.27)	0.004 \pm 0.004	0.009 \pm 0.005	- 0.7	n.s. (0.46)
Vc	0.02 \pm 0.002	0.019 \pm 0.001	0.3	n.s. (0.76)	0.02 \pm 0.003	0.018 \pm 0.002	0.3	n.s. (0.7)	0.02 \pm 0.002	0.017 \pm 0.002	0.8	n.s. (0.41)
POA	0.021 \pm 0.001	0.021 \pm 0.001	0.06	n.s. (0.94)	0.02 \pm 0.002	0.018 \pm 0.002	0.6	n.s. (0.52)	0.024 \pm 0.002	0.019 \pm 0.002	1.1	n.s. (0.29)
TPp	0.048 \pm 0.006	0.052 \pm 0.007	-0.3	n.s. (0.74)	0.072 \pm 0.01	0.054 \pm 0.005	1.4	n.s. (0.18)	0.08 \pm 0.019	0.05 \pm 0.005	1.5	n.s. (0.17)
PPv	0.059 \pm 0.01	0.054 \pm 0.005	0.4	n.s. (0.64)	0.058 \pm 0.012	0.063 \pm 0.003	-0.3	n.s. (0.72)	0.064 \pm 0.007	0.054 \pm 0.006	1.0	n.s. (0.35)
PTN	0.036 \pm 0.003	0.033 \pm 0.002	0.6	n.s. (0.51)	0.036 \pm 0.008	0.418 \pm 0.005	-0.5	n.s. (0.6)	0.038 \pm 0.005	0.034 \pm 0.005	0.5	n.s. (0.62)

1 Supplementary Table 4: *Tyrosine Hydroxylase* optical density (mean \pm SE) comparisons between “high”
2 (> median) and “low” (< median) glides and transits. ** indicates significance after correcting for
3 multiple hypotheses; * indicates significance that does not survive multiple hypothesis testing; n.s., not
4 significant

Brain Region	LL				LS				FF			
	High	Low	t	p-value	High	Low	t	p-value	High	Low	t	p-value
Glides												
OB	0.019 \pm 0.002	0.019 \pm 0.003	-0.01	n.s. (0.98)	0.017 \pm 0.001	0.024 \pm 0.003	-1.8	n.s. (0.09)	0.016 \pm 0.001	0.019 \pm 0.001	-1.4	n.s. (0.18)
Vv	0.01 \pm 0.004	0.01 \pm 0.004	-0.1	n.s. (0.85)	0.003 \pm 0.003	0.023 \pm 0.008	-2.2	n.s. (0.05)	0.01 \pm 0.004	0.005 \pm 0.005	0.8	n.s. (0.44)
Vc	0.019 \pm 0.001	0.02 \pm 0.002	-0.4	n.s. (0.68)	0.185 \pm 0.002	0.02 \pm 0.003	-0.5	n.s. (0.61)	0.014 \pm 0.001	0.021 \pm 0.002	-2.4	* (0.049)
POA	0.019 \pm 0.001	0.023 \pm 0.001	-2.2	n.s. (0.05)	0.019 \pm 0.001	0.019 \pm 0.002	-0.1	n.s. (0.85)	0.015 \pm 0.001	0.025 \pm 0.001	-3.9	* (0.008)
TPp	0.045 \pm 0.005	0.055 \pm 0.007	-1.0	n.s. (0.34)	0.065 \pm 0.012	0.061 \pm 0.004	0.3	n.s. (0.75)	0.058 \pm 0.01	0.083 \pm 0.016	-1.3	n.s. (0.24)
PPv	0.057 \pm 0.004	0.056 \pm 0.01	0.1	n.s. (0.92)	0.066 \pm 0.01	0.055 \pm 0.007	0.8	n.s. (0.42)	0.054 \pm 0.007	0.068 \pm 0.005	-1.4	n.s. (0.2)
PTN	0.032 \pm 0.002	0.036 \pm 0.002	-1.0	n.s. (0.34)	0.043 \pm 0.004	0.034 \pm 0.008	0.9	n.s. (0.35)	0.034 \pm 0.006	0.4 \pm 0.005	-0.7	n.s. (0.48)
Transits												
OB	0.02 \pm 0.003	0.019 \pm 0.0008	0.2	n.s. (0.83)	0.02 \pm 0.002	0.002 \pm 0.002	-0.4	n.s. (0.65)	0.01 \pm 0.001	0.02 \pm 0.003	-1.6	n.s. (0.14)
Vv	0.01 \pm 0.004	0.01 \pm 0.004	0.09	n.s. (0.92)	0.006 \pm 0.006	0.019 \pm 0.008	-1.3	n.s. (0.22)	0.01 \pm 0.004	0.005 \pm 0.005	0.8	n.s. (0.44)
Vc	0.02 \pm 0.002	0.02 \pm 0.001	0.09	n.s. (0.92)	0.018 \pm 0.002	0.02 \pm 0.003	-0.3	n.s. (0.76)	0.014 \pm 0.001	0.02 \pm 0.001	-2.3	n.s. (0.05)
POA	0.021 \pm 0.001	0.021 \pm 0.001	-0.2	n.s. (0.77)	0.018 \pm 0.002	0.02 \pm 0.002	-0.5	n.s. (0.59)	0.015 \pm 0.001	0.025 \pm 0.001	-3.8	* (0.008)
TPp	0.043 \pm 0.004	0.057 \pm 0.007	-1.6	n.s. (0.14)	0.071 \pm 0.01	0.054 \pm 0.006	1.3	n.s. (0.2)	0.058 \pm 0.01	0.06 \pm 0.01	-0.1	n.s. (0.86)
PPv	0.65 \pm 0.007	0.047 \pm 0.005	1.8	n.s. (0.09)	0.064 \pm 0.012	0.057 \pm 0.003	0.5	n.s. (0.6)	0.054 \pm 0.007	0.064 \pm 0.005	-1.1	n.s. (0.31)
PTN	0.035 \pm 0.024	0.033 \pm 0.003	0.3	n.s. (0.7)	0.039 \pm 0.008	0.038 \pm 0.005	0.1	n.s. (0.9)	0.034 \pm 0.006	0.034 \pm 0.001	-0.05	n.s. (0.96)