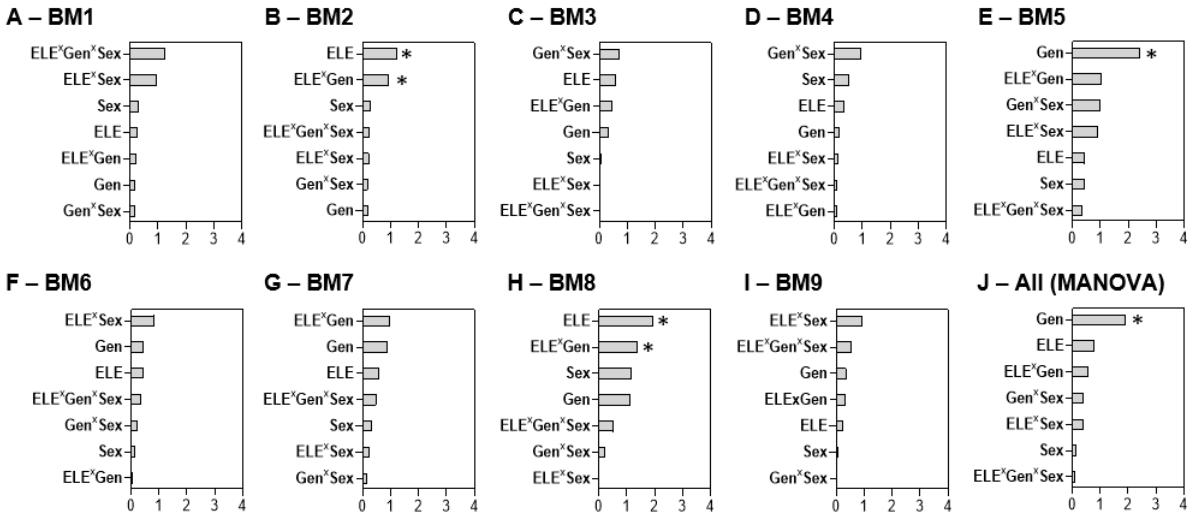
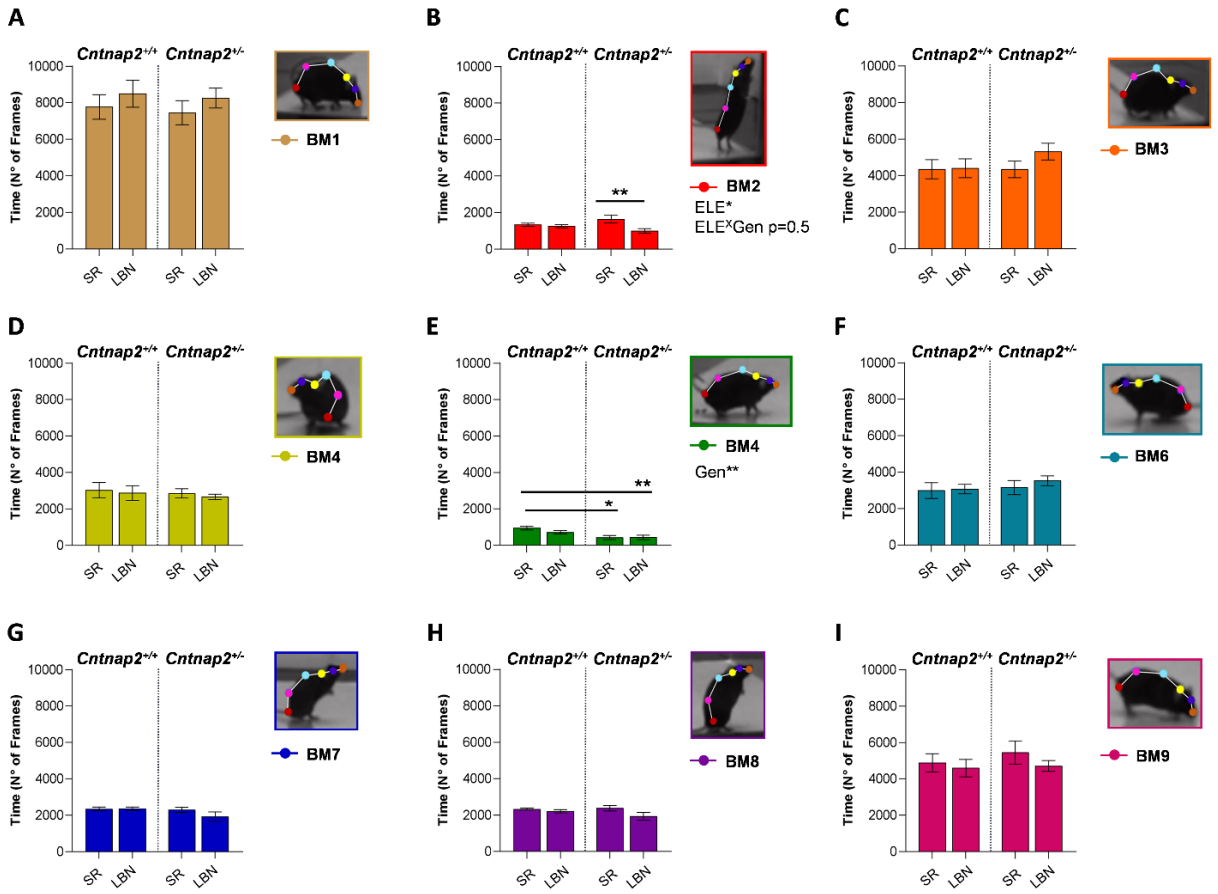
Supplementary Figures



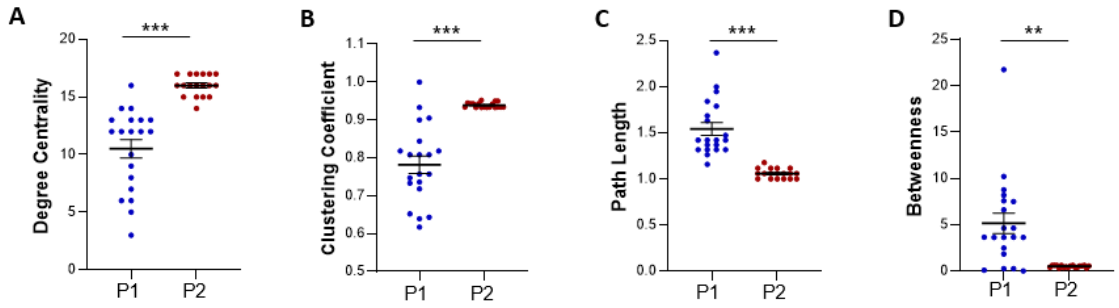
Supplementary Figure 1. Linear modeling does not suggest a significant effect of sex.

A-I) Multiple regression model to weigh the effect of the variables Early-life experience (ELE), Genotype (Gen), Sex, and their interactions does not suggest an impact of sex-differences in single BMs. A close-to-significance effect of ELE^{x}Gen^{x}Sex is found only on BM1 ($p=0.057$). Similarly, near-to-significance effect of Sex (alone) is observed on BM8 ($p=0.07$). **J)** No effect of the variable Sex nor its interactions were found with multivariate Modeling (MANOVA). * Indicates $p<0.05$. Notably, after accounting for the variable sex, the effect of ELE and Gen are preserved on BM2 and BM5, and enhanced in BM5 and BM8 (also see Supplementary figure 2). While limited by the low sample size, this evidence corroborates previous findings (21).



Supplementary figure 2. Moderate variation in single BMs expression observed across experimental groups. A-I) The plots report the BMs expression in number of frames. **B)** Marginal effect of the ELE was found in BM2 (p=0. 014,) with a near to significance effect of the ELE^{X}Gen interaction (p=0.051). The effect was mostly driven by significant differences between *Cntnap2*$^{+/-}$ SR and LBN (p=0.009). **E)** A prominent effect of the genotype was also discovered in BM5 (p=0.001), showing significant reduction in both Cntnap2$^{+/-}$ groups compared to *Cntnap2*$^{+/+}$SR (*Cntnap2*$^{+/+}$SR vs *Cntnap2*$^{+/-}$SR p=0.02, vs *Cntnap2*$^{+/-}$LBN p=0.009).

Data are expressed as mean +/- SEM. Statistical analysis was performed by two-way ANOVA. Post-hoc analysis was carried out using Tuckey's correction for multiple comparisons. *p<0.05 / **p<0.001.



Supplementary Figure 3. Additional centrality measure showing marked differences in the network homogeneity. Using multiple parameters: **A)** Degree of centrality and **(B)** Clustering Coefficient, **(C)** Path length, **(D)** Betweenness, we compared the homogeneity of P1 and P2, obtaining identical results that indicate higher similarity among P2 subjects. Mann-Whitney test. **p<0.001 / ***p<0.0001.