

**Supplementary Figure 1: Histograms of Social Distance** in which the X axis represents the distances separating two neighboring flies, in increments (or bins) of 0.5 cm, and the Y axis represents the percentage of flies in each bin  $\pm$  SEM. **A-C) Social space is relatively independent of group size and correlated to social interactions. (A) Impact of group size.**

Graph represents the comparison of Social distance histograms at densities of 10 to 40 flies per test chamber. Over a density range of 20 to 40 flies per chamber, the repartition of the flies represented by the histograms was not statistically different, but the proportion of flies two-body length apart or less (first bin, see text) was lower at a density of 10 flies, do have larger social distance, and less of them are found in the first bin (n=8 trials, number of male flies indicated, Kolmogorov-Smirnov Comparison indicates that the data-sets are different -  $p < 0.0001$ ).

**(B-C) Social space is affected by social experience. B) Virgin flies show less social interaction.**

Graph represents the comparison of histograms for the social distance of flies 3-4 days old (aged with the same gender), or mated (housed gender mixed) flies; males housed with males (virgin), n=10 trials of ~40 flies, Males housed with females (gender mixed), n=21 trials of 40 flies; females, virgin, n=11 trials of ~40, house gender mixed, n=14 trials of 40 flies (Kolmogorov-Smirnov Comparison indicates that the two data-sets of gender-mixed versus virgin are different -  $p < 0.001$  for males and  $p < 0.013$  for females).

**C) Isolated flies show less social interaction.**

Graph represents the comparison of histograms of social distance of flies ~10 days old, collected from bottles at ~3 days old, and aged for 7 days either alone, or socially enriched in groups of 40 flies of same gender. Males n=5-6 trials of ~40 flies, Females, n=5 trials of ~40, for both males and females comparisons, Kolmogorov-Smirnov Comparison indicates that the data-sets of isolated versus socially enriched are different -  $p < 0.0001$  for males,  $p < 0.019$  for females.

**(D-E) Social distance is not modified in odor perception mutants. D) *para<sup>sib-1</sup>*, compared to genetic**

background Canton-s males, n=6 trials of ~40 flies. **E)** *Or83b<sup>1</sup>* and *Or83b<sup>2</sup>* compared to genetic background Canton-s males, n=6 trials of ~40 flies. Kolmogorov-Smirnov Comparison indicates that the data sets are not different. **F) Flies show a lesser degree of social interaction in darkness**, under a red light. Graph represents the comparison of social distance in light and dark conditions (Canton-s males, n=15 trials of ~40 flies, Kolmogorov-Smirnov Comparison indicates that the data-sets are different -  $p < 0.001$ ). **G) Outcrossed mutants *white*, disrupting the eye pigments localization, show less social aggregation** ( $w^{1118}Cs_{10}$ , outcrossed 10 times, indicated as w), compared to their genetic control Canton-s (Cs). **In males**, n=21 trials for Cs, and n=18 for w, and **in females**, n=16 trials for Cs, and n=12 trials for w. Kolmogorov-Smirnov Comparison indicates that the data sets of the two genotypes are different ( $p < 0.0001$  for males,  $p < 0.05$  for females).

