Supplementary Information of Rapid Bayesian learning in the mammalian olfactory system

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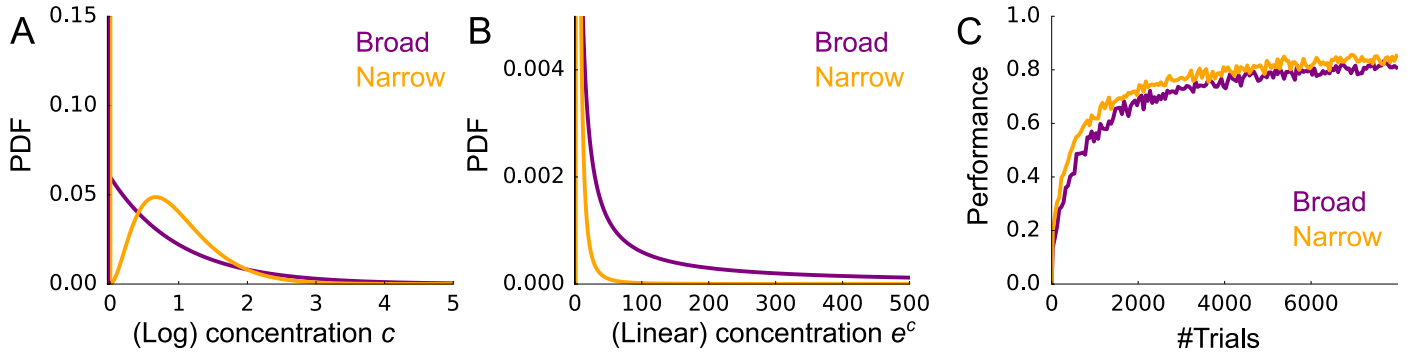
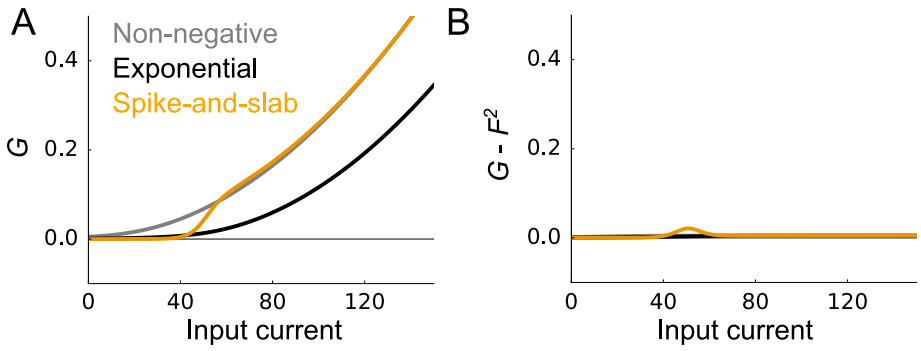


Supplementary Figure 1: **Learning performance under a broader concentration distribution A)** Log-concentration of the odor, c, under the distribution we used in the main text (orange line; slab $\propto c^2 e^{-3c}$), and under a broader distribution (purple; slab $\propto e^{-c}$), the latter chosen to have the same mean as the slab used in the main text. **B)** Same as **A**, but plotted against e^c, which corresponds to the real (linear) concentration, not the log-concentration we used throughout the main text. **C)** Learning performance under the two odor concentration distributions. Performance is only slightly worse under the broader prior.



Supplementary Figure 2: **The effect of the prior on the precision update A)** The shape of the transfer function for the precision update $G[y;\bar{c}=0]$ under the non-negative (gray), exponential (black), and spike-and-slab prior (orange). **B)** The difference between $G[y;\bar{c}=0]$ and $F[y;\bar{c}=0]^2$ (ie. [Supp. Fig. 2A] – [Fig. 5A]^2) under the three priors. The gray line for the non-negative prior is hidden under the black line for the exponential prior (they are both nearly zero).