

Supplemental Material S5. Distributions on the probability scale for default and alternative prior specifications for Bayesian model fitting.

Simulated prior densities (10^7 samples) for participants’ baseline ability parameters. Each row displays a different prior specification for the means μ and standard deviations σ of the logit-normal densities applied to each baseline ability $\beta_{0,n,p}$ on the probability scale: 1) the top row is minimally informative about MPT-P(S), 2) the middle row is minimally informative about the average latent mental decision, and 3) the bottom row is informed by the distributions of estimates obtained previously for an independent set of 90 participants from the same research group (Walker et al., 2018). The first column shows the prior probability of success for the least difficult latent mental decision ($\delta_{k,p} = -3.7$). The second column shows the prior probability of success for the average latent mental decision ($\delta_{k,p} = -1.8$). The third column shows the prior probability of success for the most difficult latent mental decision ($\delta_{k,p} = 1.6$). The fourth column shows the prior probability of a correct response on an item with average latent mental decisions, that is, MPT-P(S).

