

Table S1. Normal Mixture Approximations to -log(Ga(r, 1)) for r in [1, 5]. Normal mixture approximations to $-\log(\text{Ga}(r, 1))$ for r in $[1, 5]$. A separate normal mixture distribution is used to approximate each negative log gamma distribution. The estimated parameters in the normal mixture distribution ensure that the Kullback-Leibler (KL) divergence between the two distributions is below 5×10^{-4} . The parameters in the normal mixture distribution include the number of normal components (k), their weights (w), means (m) and variances (σ^2). Means and variances are shown in their standardized version, where $\Psi(r)$ denotes the digamma function and $\psi'(r)$ denotes the trigamma function.