

Table S1

Model	Prior	Mean	Variance
HGF ₃	κ	1	0
	ω_2	-4	16
	ω_3	-7	16
	$\mu_2^{(0)}$	0	0
	$\sigma_2^{(0)}$	0.1	0
	$\mu_3^{(0)}$	1	0
	$\sigma_3^{(0)}$	1	0
	ζ	48	1
HGF ₂	κ	0	0
	ω_2	-4	16
	ω_3	-7	0
	$\mu_2^{(0)}$	0	0
	$\sigma_2^{(0)}$	0.1	0
	$\mu_3^{(0)}$	1	0
	$\sigma_3^{(0)}$	1	0
	ζ	48	1
HGF _{μ_3}	κ	1	0
	ω_2	-4	16
	ω_3	-7	16
	$\mu_2^{(0)}$	0	0
	$\sigma_2^{(0)}$	0.1	0
	$\mu_3^{(0)}$	1	1
	$\sigma_3^{(0)}$	1	1

Table S1. Means and variances of the priors on perceptual parameters and starting values of the beliefs of the HGF models. Values are shown for 3-level HGF, 2-level HGF and HGF _{μ_3} models. Free parameters are estimated in their unbounded space. Parameters that are restricted to a confined interval are log-transformed, to allow for estimation in an unbounded space: ζ , $\sigma_2^{(0)}$, $\sigma_3^{(0)}$, κ . The prior variances are given in the space in which the parameters are typically estimated. We fixed some of these parameters, however (prior variance = 0 in the space in which they are estimated). As in recent work^{14,83}, the initial values of the belief trajectories were fixed in each individual for the 3-level HGF and 2-level HGF models: $\mu_2^{(0)}$, $\sigma_2^{(0)}$, $\mu_3^{(0)}$, $\sigma_3^{(0)}$. We estimated ω_2 , ω_3 in each participant (ω_2 only for the 2-level HGF). The winning model HGF _{μ_3} had as free parameters ω_2 , ω_3 , $\mu_3^{(0)}$, and $\sigma_3^{(0)}$, and the mapping from beliefs to decisions was a function of the inverse decision noise parameter $e^{-\mu_3^{k-1}}$.