

Model fitting to human choice and accuracy data

"Accuracy increased across the block overall" :

Effect 01: "trial" $F(6.87, 116.86) = 29.902$, $p = 0.000$

"but did so faster in blocks with familiar cues." :

Effect 01: "trial" $F(6.87, 116.86) = 29.902$, $p = 0.000$

Effect 02: "novel" $F(1.00, 17.00) = 149.680$, $p = 0.000$

Effect 03: "novel""trial" $F(6.94, 117.96) = 2.899$, $p = 0.008$

"Participants began with a bias to respond `target` that abated across the block in roughly equal measure for the two conditions."

Effect 01: "trial" $F(7.37, 125.24) = 46.063$, $p = 0.000$

Effect 02: "novel" $F(1.00, 17.00) = 24.619$, $p = 0.000$

Effect 03: "novel""trial" $F(6.78, 115.25) = 0.454$, $p = 0.861$

interaction between conditions

"specifically, mean values of alpha R were" ... "for blocks with familiar and novel cues respectively, diverging reliably from the respective parameters" ... "that yielded maximal performance under this model in both cases"

mean fittings : 0.39 0.43

mean optimals : 0.13 0.23

std fittings : 0.28 0.25

std optimals : 0.10 0.10

familiar ttest : $t(17) = +4.33$, $p = 0.000$

novel ttest : $t(17) = +3.30$, $p = 0.004$

"similarly, mean values for tau were" ... "both showing a divergence from the performance-maximising parameters" ... "that was statistically reliable"

alpha_m

mean fittings : 0.79 0.94

mean optimals : 0.11 0.28

std fittings : 0.74 0.64

std optimals : 0.03 0.16

familiar ttest2 : $t(17) = +3.92$, $p = 0.001$

novel ttest2 : $t(17) = +4.05$, $p = 0.001$

tau

mean fittings : 0.41 0.44

mean optimals : 0.10 0.37

std fittings : 0.20 0.12

std optimals : 0.11 0.14

familiar ttest : $t(17) = +5.84$, $p = 0.000$

novel ttest : $t(17) = +1.60$, $p = 0.127$

"however, values of tau were smaller ... and values of alpha R were larger" ... "in the familiar relative to novel cues condition"

alpha_M ttest : $t(17) = -0.64, p = 0.532$
alpha_R ttest : $t(17) = -0.41, p = 0.688$
tau ttest : $t(17) = -0.68, p = 0.508$

"interaction between fittings/optimal and familiar/novel"

alpha_R

Effect 01: "cue" $F(1.00,17.00)=1.685, p=0.212$
Effect 02: "optimal" $F(1.00,17.00)=28.169, p=0.000$
Effect 03: "optimal""cue" $F(1.00,17.00)=0.648, p=0.432$

tau

Effect 01: "cue" $F(1.00,17.00)=17.597, p=0.001$
Effect 02: "optimal" $F(1.00,17.00)=26.765, p=0.000$
Effect 03: "optimal""cue" $F(1.00,17.00)=13.456, p=0.002$

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RANKSUM TEST

adaptation between conditions

fittings on co3

$p(\alpha_M) = 0.380$
 $p(\alpha_R) = 0.623$
 $p(\tau) = 0.762$

optimals on co3

$p(\alpha_M) = 0.000$
 $p(\alpha_R) = 0.003$
 $p(\tau) = 0.000$

deviance from optimality

familiar on co3

$p(\alpha_M) = 0.000$
 $p(\alpha_R) = 0.001$
 $p(\tau) = 0.000$

novel on co3

$p(\alpha_M) = 0.001$
 $p(\alpha_R) = 0.038$
 $p(\tau) = 0.077$

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CORRELATION PARAMETER / PERFORMANCE

ALPHA M

$r(\text{familiar}) = -0.7747$

$r(\text{novel}) = -0.0417$

$p(\text{familiar}) = 0.0002$

$p(\text{novel}) = 0.8694$

ALPHA R

$r(\text{familiar}) = -0.5908$

$r(\text{novel}) = -0.4592$

$p(\text{familiar}) = 0.0098$

$p(\text{novel}) = 0.0553$

TAU

$r(\text{familiar}) = -0.4731$

$r(\text{novel}) = -0.5426$

$p(\text{familiar}) = 0.0474$

$p(\text{novel}) = 0.0200$

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BIC SCORES

Fitting (familiar / novel)

BIC(human)	$= 32.0413 \pm 0.1759$	$= 32.7083 \pm 0.0744$
BIC(god)	$= 38.6333 \pm 0.3613$	$= 40.0568 \pm 0.1324$
BIC(hbm)	$= 36.8194 \pm 0.5052$	$= 38.6293 \pm 0.2327$
BIC(ta3)	$= 37.8985 \pm 0.2117$	$= 39.1219 \pm 0.1770$
BIC(ta3opt)	$= 39.7748 \pm 0.3826$	$= 41.7100 \pm 0.2193$
BIC(co3)	$= 38.0386 \pm 0.2196$	$= 38.9329 \pm 0.1918$
BIC(co3opt)	$= 40.6822 \pm 0.3417$	$= 41.7815 \pm 0.2204$
BIC(taco4)	$= 39.0755 \pm 0.1762$	$= 40.0401 \pm 0.1637$
BIC(taco4opt)	$= 41.3003 \pm 0.3899$	$= 43.1427 \pm 0.2243$

Test (familiar / novel)

BIC(human)	$= 31.9841 \pm 0.2089$	$= 32.7730 \pm 0.0544$
BIC(god)	$= 38.2427 \pm 0.4556$	$= 40.0047 \pm 0.2188$
BIC(hbm)	$= 36.5909 \pm 0.5426$	$= 38.3735 \pm 0.2471$
BIC(ta3)	$= 39.5754 \pm 0.3627$	$= 41.0839 \pm 0.4033$
BIC(ta3opt)	$= 40.4352 \pm 0.4451$	$= 41.6207 \pm 0.3443$
BIC(co3)	$= 40.0569 \pm 0.3723$	$= 41.0461 \pm 0.3670$
BIC(co3opt)	$= 41.0717 \pm 0.4175$	$= 41.7441 \pm 0.3819$

BIC(taco4)	$= 41.2352 \pm 0.3060$	$= 42.5176 \pm 0.3498$
BIC(taco4opt)	$= 41.6794 \pm 0.4745$	$= 43.1694 \pm 0.3673$