**Data**

* *Excluded subjects who timed out on more than 50 (out of 250) trials. (Note that we’re NOT doing the exclusion based on Monte Carlo simulated final scores.)*
* *t values are from paired t-tests, V value are from Wilcoxon signed rank tests*
* *β values are from the simple model (w/ just MFonMB as a fixed & random effect), z values are from the Wald z test, and Chi-sq values are from a likelihood ratio test comparing simple model to null model*
* *All analyses conducted in R*

**Baseline**  
217 subjects, 6090 crit trials

Mean choice when MFonMB > 0: 85.2%, SE = 1.2%  
Mean choice when MFonMB < 0: 68.7%, SE = 1.3%  
t = -11.0568, df = 216, p-value < 2.2e-16

β = .15  
z = 11.43, p < 2.2e-16  
χ2(2) = 308.93, p < 2.2e-16

WSLS (stay):  
Mean choice when MFonMB > 0: 76.1%, SE = 1.5%  
Mean choice when MFonMB < 0: 72.9%, SE = 1.6%  
t = -2.11, df = 213, p-value = 0.03603

WSLS (shift):  
Mean choice when MFonMB > 0: 55.9%, SE = 3.1%  
Mean choice when MFonMB < 0: 39.7%, SE = 2.5%  
t = -3.3556, df = 145, p-value = 0.001011

**Daw stage 2**243 subjects, 6206 crit trials

Mean choice when MFonMB > 0: 78.7%, SE = 1.2%  
Mean choice when MFonMB < 0: 74.9%, SE = 1.2%  
t = -3.2704, df = 242, p-value = 0.00123

β = .032  
z = 3.8, p = .000145  
χ2(2) = 17.7, p = .000142

WSLS (stay):  
Mean choice when MFonMB > 0: 76.8%, SE = 1.2%  
Mean choice when MFonMB < 0: 74.2%, SE = 1.3%  
t = -1.8922, df = 254, p-value = 0.0596

WSLS (shift):  
Mean choice when MFonMB > 0: 39.0%, SE = 2.4%  
Mean choice when MFonMB < 0: 42.2%, SE = 2.2%  
t = 0.806, df = 179, p-value = 0.4213

**Original number sum – all crits**  
250 subjects, 6227 crit trials

Mean choice when MFonMB > 0: 79.7%, SE = 1.2%  
Mean choice when MFonMB < 0: 69.5%, SE = 1.2%  
t = -7.147, df = 249, p-value = 9.787e-12

β = .082  
z = 7.42, p = 1.14e-13  
χ2(2) = 137.9, p < 2.2e-16

**Original number sum – novel crits**250 subjects, 976 crit trials

Mean choice when MFonMB > 0: 74.7%, SE = 2.4%  
Mean choice when MFonMB < 0: 68.6%, SE = 2.3%  
t = -2.0168, df = 203, p-value = 0.04503

β = .04  
z = 1.9, p = .064  
χ2(2) = 3.55, p = .17

**Dayan deterministic – all crits**49 subjects, 3089 crit trials

Mean choice when MFonMB > 0: 74.4%, SE = 2.9%  
Mean choice when MFonMB < 0: 52.3%, SE = 1.9%  
t = -7.0195, df = 47, p-value = 7.636e-09

β = .27  
z = 7.3, p = 3.09e-13  
χ2(2) = 265, p < 2.2e-16

WSLS (stay):  
Mean choice when MFonMB > 0: 73.1%, SE = 2.9%  
Mean choice when MFonMB < 0: 56.1%, SE = 3.1%  
t = -5.2, df = 47, p-value = 4.24e-6

WSLS (shift):  
Mean choice when MFonMB > 0: 48.1%, SE = 3.7%  
Mean choice when MFonMB < 0: 30.3%, SE = 4.1%  
t = -3.0439, df = 47, p-value = 0.003818

**Dayan deterministic – novel crits**49 subjects, 195 crit trials

Mean choice when MFonMB > 0: 68.0%, SE = 5.2%  
Mean choice when MFonMB < 0: 45.7%, SE = 7.3%  
t = -2.4697, df = 30, p-value = 0.01943  
*(note that the df = 30 here b/c only 31 subjects had both MFonMB > 0 and MFonMB < 0 trials)*

β = .21  
z = 2.96, p = .0031  
χ2(2) = 9.58, p = .0083

**Dayan stochastic – all crits**194 subjects, 3169 crit trials

Mean choice when MFonMB > 0: 76.1%, SE = 1.7%  
Mean choice when MFonMB < 0: 56.3%, SE = 1.8%  
t = -9.3286, df = 190, p-value < 2.2e-16

β = .13  
z = 10.1, p < 2.2e-16  
χ2(2) = 139.4, p < 2.2e-16

WSLS (stay):  
Mean choice when MFonMB > 0: 74.5%, SE = 1.7%  
Mean choice when MFonMB < 0: 59.3%, SE = 2.6%  
t = -4.9293, df = 178, p-value = 1.88e-06

WSLS (shift):  
Mean choice when MFonMB > 0: 48.2%, SE = 3.0%  
Mean choice when MFonMB < 0: 39.7%, SE = 2.9%  
t = -1.9847, df = 134, p-value = 0.04922

**Dayan stochastic – novel crits**194 subjects, 715 crit trials

Mean choice when MFonMB > 0: 72.3%, SE = 2.6%  
Mean choice when MFonMB < 0: 54.6%, SE = 3.3%  
t = -3.7842, df = 145, p-value = 0.000225

β = .1  
z = 4.64, p = 3.47e-6  
χ2(2) = 22.3, p = 1.46e-5

**Simulated Data**

* *All simulations have N=500 agents.*
* *Parameters are: lr, elig, temp, w\_MFG, w\_MB. lr ~ U(0,1); elig ~ U(.5,1); temp ~ U(.5,1.5)*

**with GL**

Mean choice when MFonMB > 0: 88.3%, SE = .6%  
Mean choice when MFonMB < 0: 79.5%, SE = .7%  
t = -11.1884, df = 498, p-value < 2.2e-16

β = .064  
z = 12.55, p < 2.2e-16  
χ2(2) = 230.07, p < 2.2e-16

**no GL**

Mean choice when MFonMB > 0: 81.9%, SE = .6%  
Mean choice when MFonMB < 0: 81.3%, SE = .7%  
t = -0.8159, df = 498, p-value = 0.4149

β = .003  
z = .73, p = .465  
χ2(2) = 2.09, p = .35

**all 3 controllers**

Mean MB earnings: 387, SE = 7  
Mean MF earnings: 298, SE = 8  
Mean MFG earnings: 354, SE = 7

MFG vs MF: t(499) = 9.93, p < .0001  
MFG vs MB: t(499) = -6.70, p < .0001