

Group 2: Project 2

1) Implement the version of the Pearce-Hall model as described in Li et al. (2011; see their supplementary materials). Show how this model results in a faster learning rate when rewards are more volatile (see Behrens et al., 2007). Compare this model to the standard Rescorla-Wagner model, which lacks an adaptive learning rate.

2) What happens to the learning rate and value after increases/decreases in positive and/or negative prediction errors? How can these two signals be distinguished experimentally?

3) Discuss the neural and behavioral evidence for adaptive learning rate (see Roesch et al., 2011).

References:

Behrens, T.E., Woolrich, M.W., Walton, M.E. & Rushworth, M.F. (2007) Learning the value of information in an uncertain world. *Nature Neuroscience*, *10*, 1214–1221.

Li, J., Schiller, D., Schoenbaum, G., Phelps, E.A., & Daw, N.D. (2011). Differential roles of human striatum and amygdala in associative learning. *Nature Neuroscience*, *14*, 1250–1252.

Roesch, M.R., Esber, G.R., Li, J., Daw, N.D., and Schoenbaum, G. (2012). Surprise! Neural correlates of Pearce-Hall and Rescorla-Wagner coexist within the brain. *European Journal of Neuroscience*, *35*, 1190–1200.