Supplementary Material

Sequential Effects in Response Time Reveal Learning Mechanisms and Event Representations

Matt Jones, Tim Curran, Michael C. Mozer, Matthew H. Wilder

Psychological Review

The files here contain the data from Experiments 1 and 2 and code for running the parallel-learning and joint-learning models. The code is written in Matlab (http://mathworks.com).

E1data.txt

ACSII file containing behavioral data from Experiment 1. Each row represents one trial. Columns are subject number (1-28), condition (1=Negative, 2=Positive), session, block, trial number (within block), stimulus, response, RT (in ms), and an indicator of which trials were included in analyses (based on trial inclusion criteria given in the paper).

ERPdata.mat

Matlab data file containing ERP data from Experiment 1, with the following variables.

peristimLRP, *perirespLRP*: Stimulus- and response-locked LRP waveforms, for each subject, condition, and 3-deep history. Data field contains waveforms for all 28 individual subjects and average of waveforms across all subjects (as 29th subject). Jackknife field contains waveforms averaged over sets of 27 subjects—the entries for subject *i* are averages over all subjects except *i*. Data and Jackknife fields are both 4-dimensional arrays, indexed by subject, time, history, and condition. Values for these indices are given in the Subject, Time, History, and Condition fields. Times are relative to stimulus onset for peristimLRP and to the response for perirespLRP. Channel field indicates the EEG channels used (36 and 104).

sLRPcrits, *LRPrcrits*: The three criteria used for determining the time of LRP onset, in peristimulus and periresponse analyses, respectively.

sLRP, *LRPr*: Estimates of stimulus-LRP and LRP-response intervals, respectively. Both variables are 4-dimensional arrays, indexed by subject (with group data as 29th subject), history, condition (Negative then Positive), and LRP onset criterion (as given by sLRPcrits and LPRrcrits).

P100: Mean P100 amplitude for each subject, 3-deep history, and condition.

E2data.txt

ACSII file containing data from Experiment 2. Each row represents one trial. Columns are subject number (1-181), hand (0=nondominant, 1=dominant), coherence (1=low, 2=high), block, trial number (within block), stimulus, response, RT (in ms), and an indicator of which trials were included in analyses (based on trial inclusion criteria given in the paper).

parallel.m

Matlab code for generating predictions of the parallel-learning model, based on derivations in Appendix A of the paper. Input *theta* specifies model parameters, as indicated in lines 9-14. Input *dir* equals -1 for Experiment 1 Negative condition, 1 for Experiment 1 Positive condition, or 0 for Experiment 2. Output is a vector of predicted mean RTs for all 4-deep trial histories.

joint.m

Matlab code for generating predictions of the joint-learning model. Input: *theta* specifies model parameters (see lines 13-15); *stim* is the stimulus sequence to be simulated, encoded as {0,1}; *include* indicates which trials to include in predictions of mean RT; *dataset* is 1 for predicting Experiment 1 RT, "sLRP" for stimulus-LRP interval, "LRPr" for LRP-response interval, "P100" for P100 amplitude, or 2 for Experiment 2 RT. Output is a vector of predictions for all 4-deep (RT) or 3-deep (ERP) trial histories.