

**SUPPLEMENTARY MATERIALS FOR
A COMPARATIVE STUDY OF DRIFT DIFFUSION AND
LINEAR BALLISTIC ACCUMULATOR MODELS IN A REWARD
MAXIMIZATION PERCEPTUAL CHOICE TASK**

STEPHANIE GOLDFARB, NAOMI EHRICH LEONARD, PATRICK SIMEN,
CARLOS H. CAICEDO-NÚÑEZ, AND PHILIP HOLMES

Here we provide additional details on individual participant fits.

Figures S1-S7 show details of fits to individual participants for the five models, averaged over all trials in sessions 10-13, for each given coherence. Specifically, Figures S1 and S2 show RTs and ERs versus coherence for the experimental data and as predicted by fits of the five models. Figure S4 shows the mean normalized DTs versus ERs in comparison with the unique OPC for the pure DDM. Finally, Figures S3, S5, and S6 show reward rates (RR), thresholds (z), and starting point variability (s_x , or A) versus coherence for the model fits.

Participants are presented from left to right and top to bottom in each figure, based on closeness of behavior to that predicted by the OPC for the pure DDM. Closeness is measured by mean square differences between mean normalized DTs and mean normalized DTs on the OPC computed for each individual. The participant with the smallest score, Subject 39, appears in the upper left corner of each figure, and the participant with the highest score, Subject 17, appears in the lower right corner.

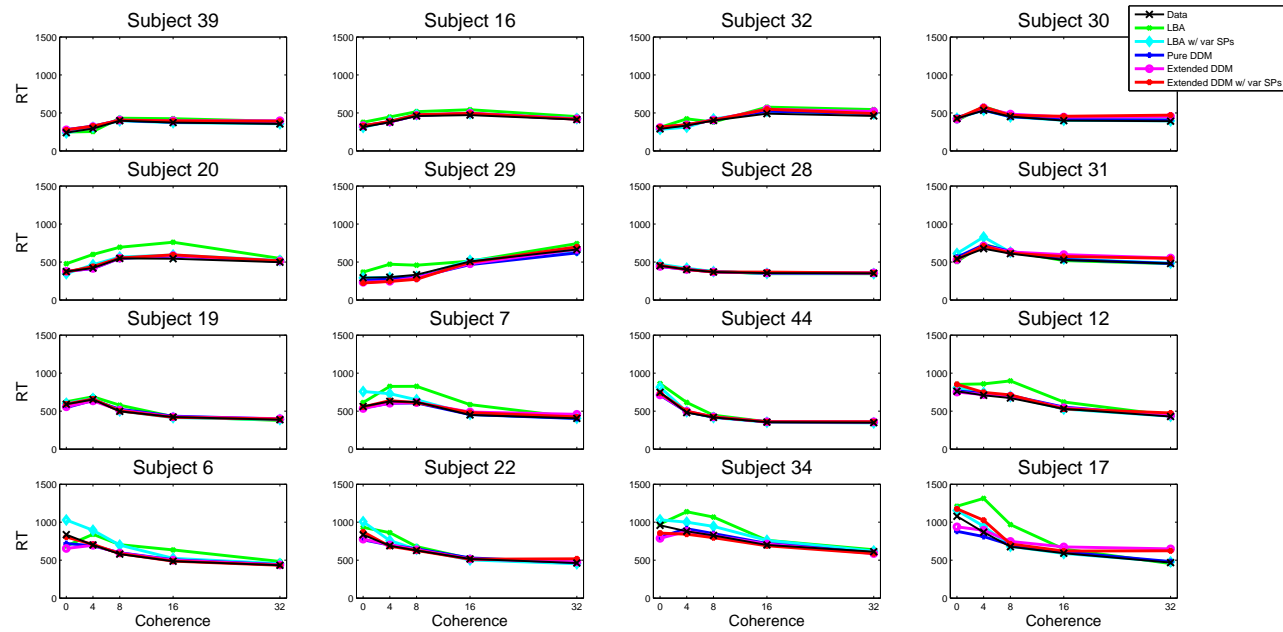


FIGURE S1. Comparison of data and fits to RT, in msec, by participant and closeness to OPC for the DDM. Several participants have relatively long RTs on the hardest tasks (0 and 4% coherence), for which optimal behavior requires responses at or near signal detection speed.

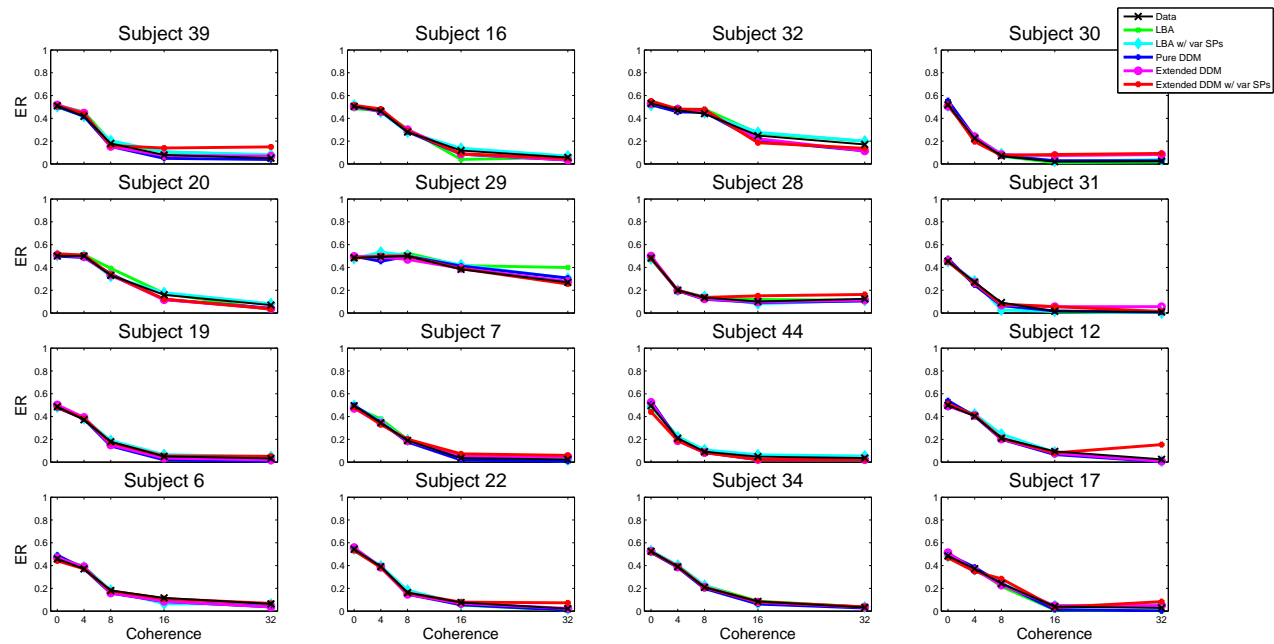


FIGURE S2. Comparison of data and model fits to ER, by participant and closeness to OPC for the DDM. Several participants (e.g. Subjects 22, 30, and 32) performed at worse than chance accuracy in the 0% coherence condition, and all models captured this behavior.

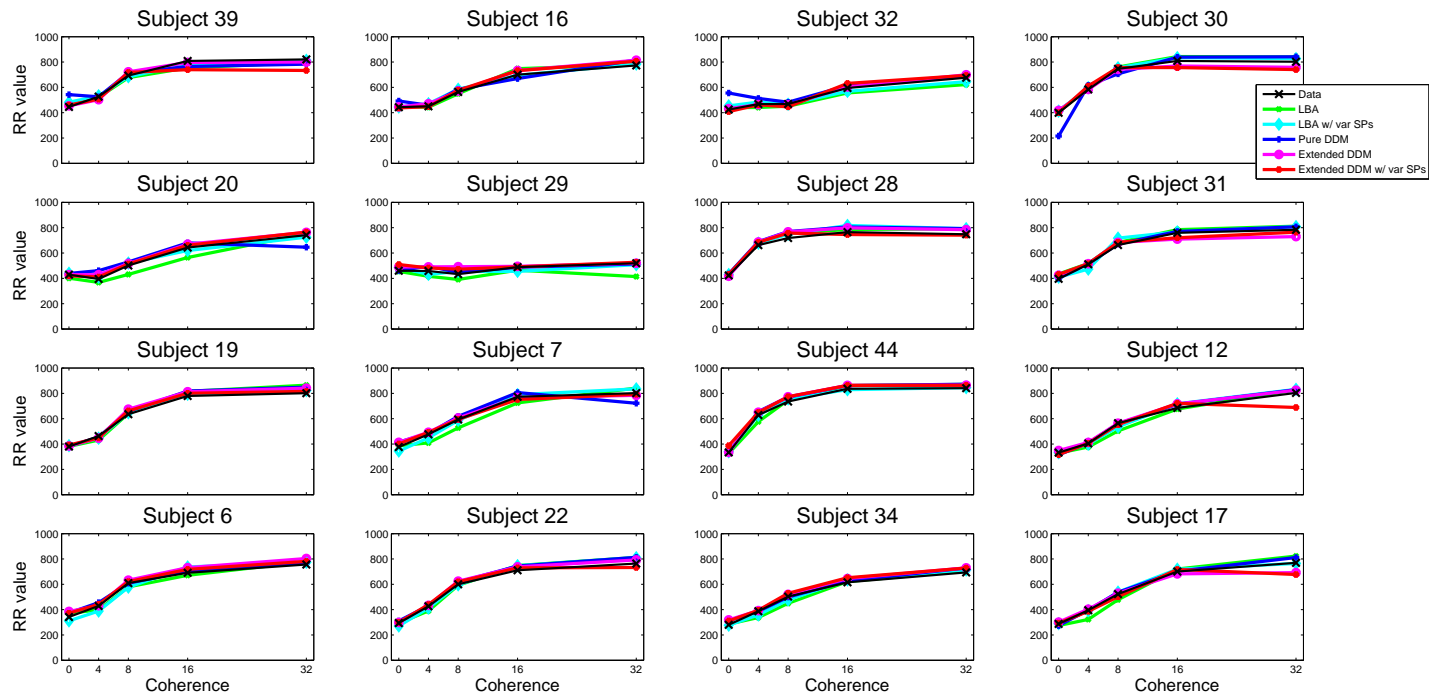


FIGURE S3. Comparison of data and model fits to RR (total rewards earned in Sessions 10-13) by participant and closeness to OPC for the DDM. Subject 29 had an unusual near-flat response curve.

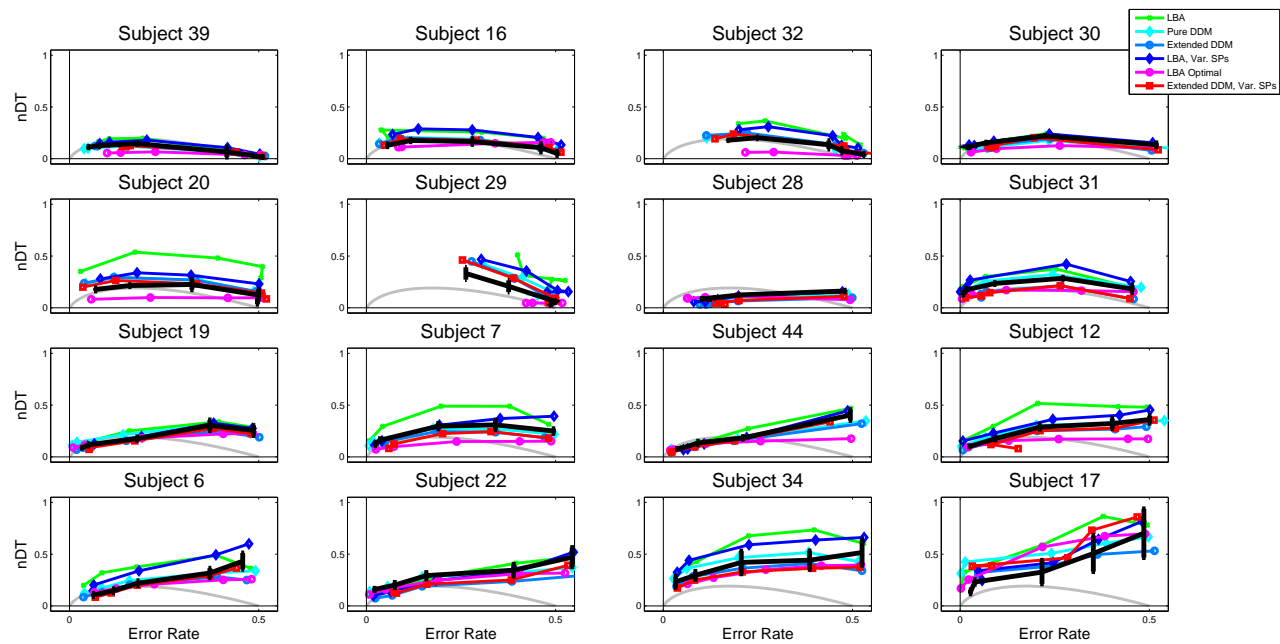


FIGURE S4. Comparison of data and model fits to mean normalized DT and ER data by participant and closeness to OPC for the DDM. Data is shown in black, with error bars for each ER bin; OPC for pure DDM shown in gray. Some differences among LBA and DDM predictions are due to differences among model estimates of nondecision time.

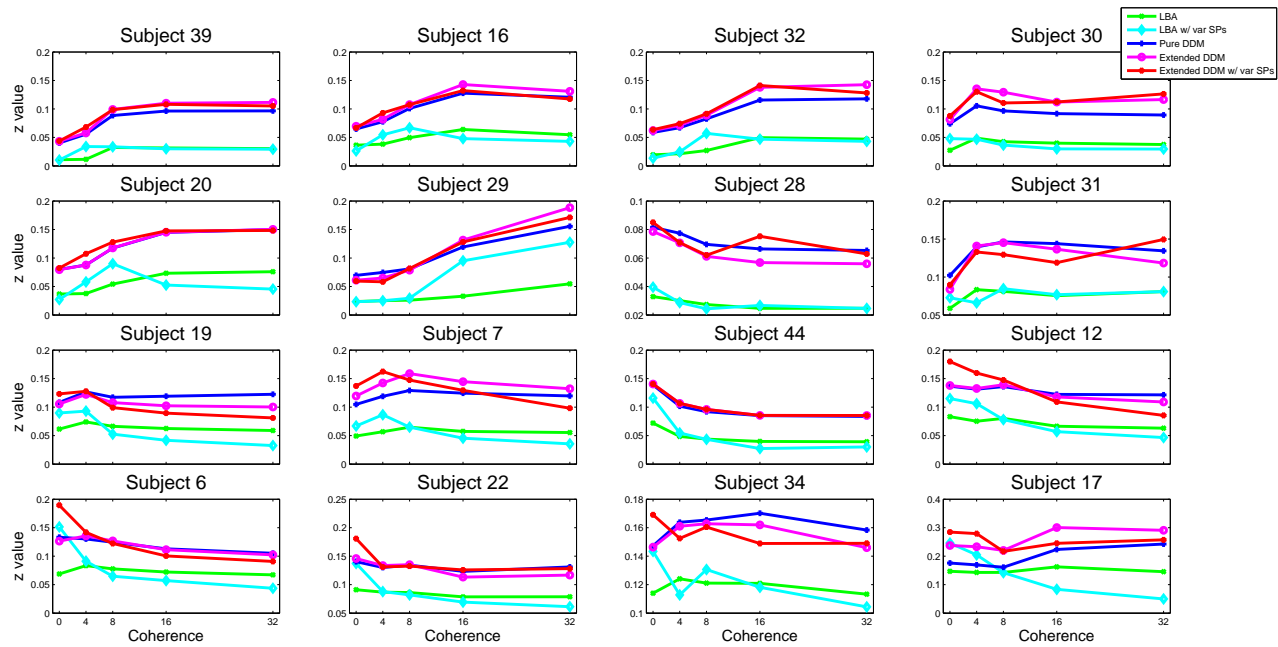


FIGURE S5. Comparison of caution or threshold parameter model fits, by participant and closeness to OPC for the DDM. LBA values z have been scaled down by a factor of 5000, to fit on the same axis.

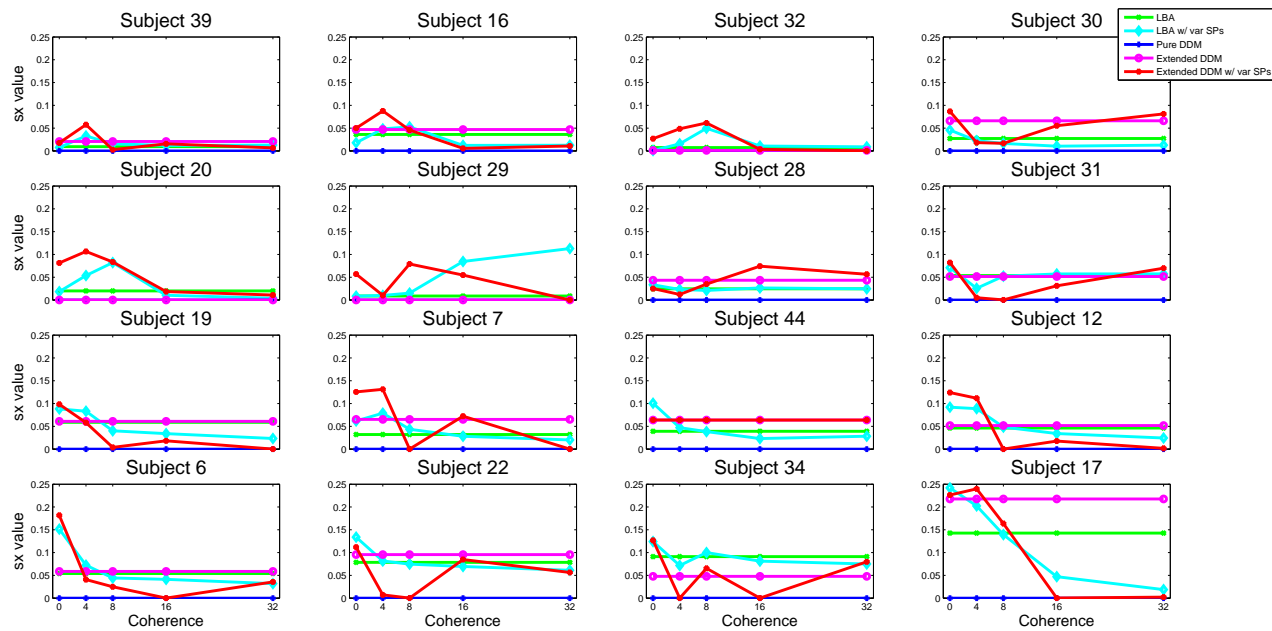


FIGURE S6. Comparison of variability in starting point model fits, by participant and closeness to OPC for the DDM. On average, variability appears to be greater at low than high coherences. LBA values A have been scaled down by a factor of 5000, to fit on the same axis. The pure DDM has zero variability in starting points.

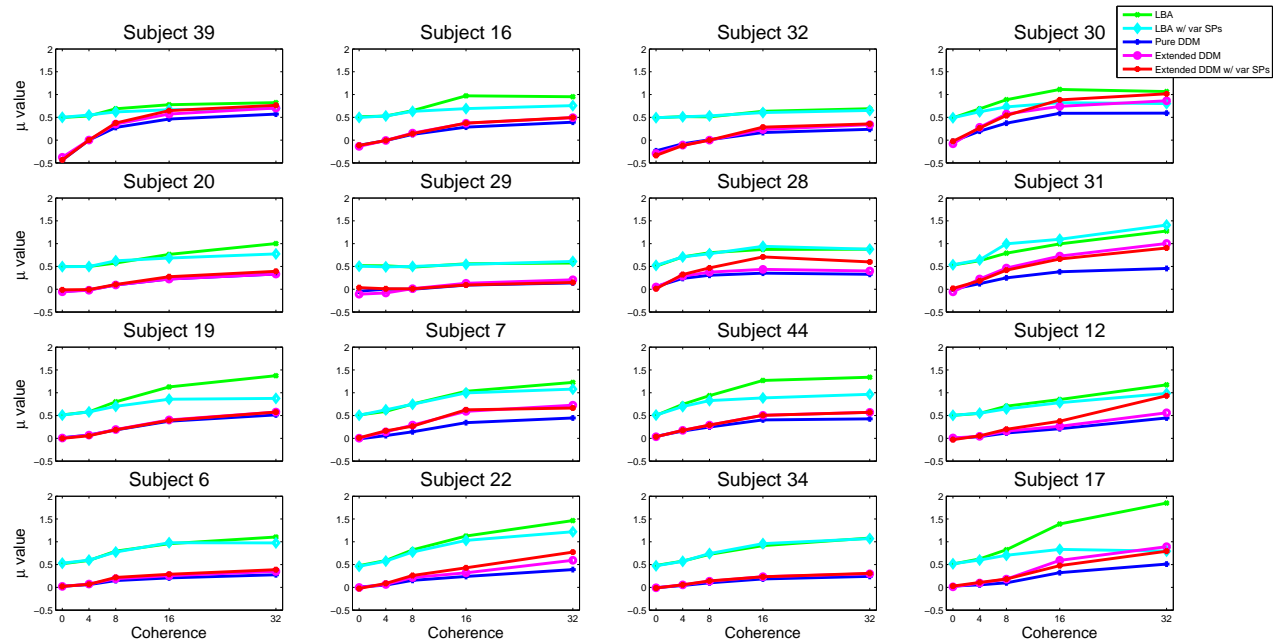


FIGURE S7. Comparison of mean drift parameter model fits, by participant and closeness to OPC for the DDM. As expected, all drift magnitudes increase monotonically with coherence. LBA drift rate estimates have not been shifted, as in the subject-averaged data of Figure 6(b).