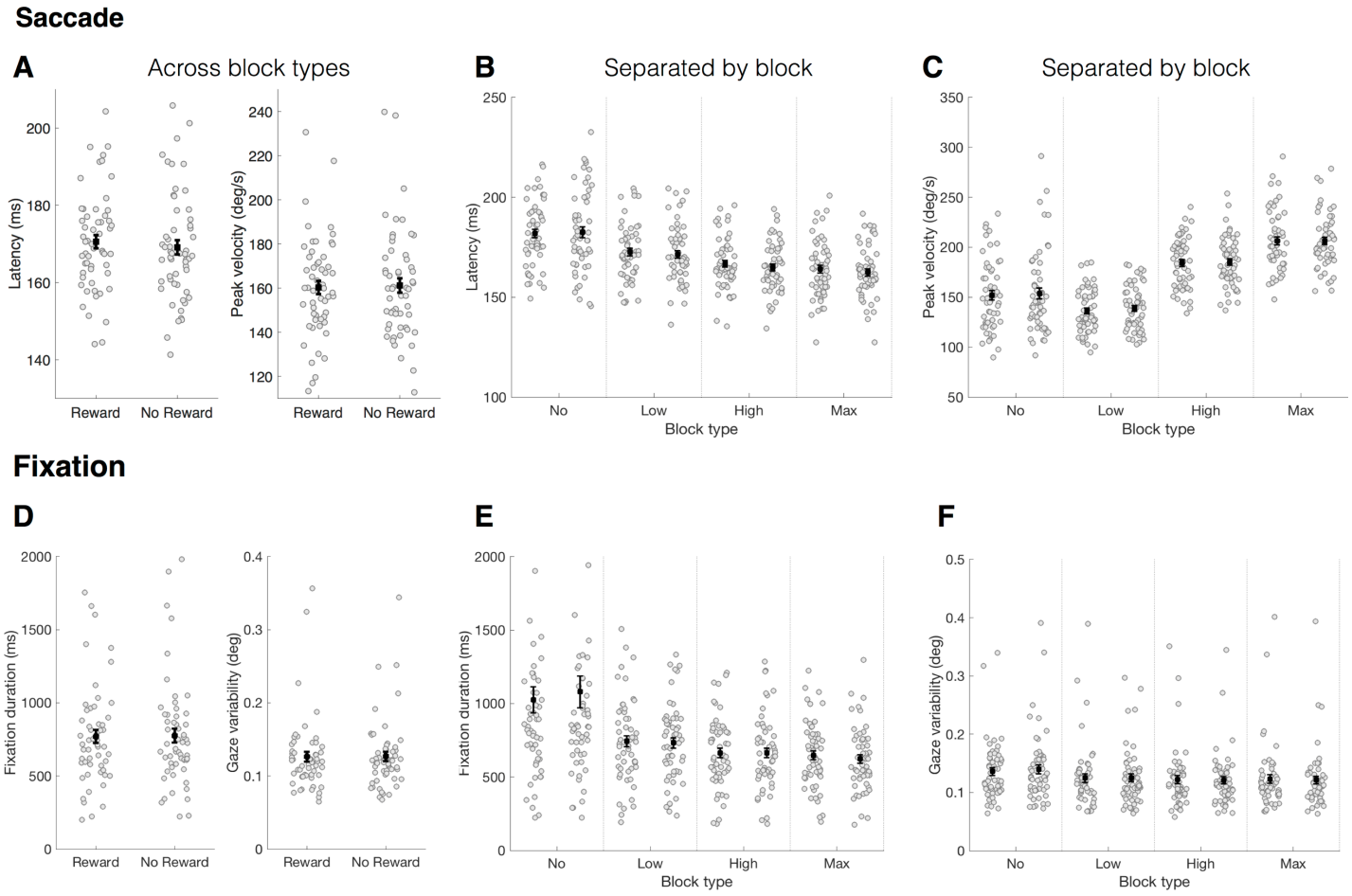
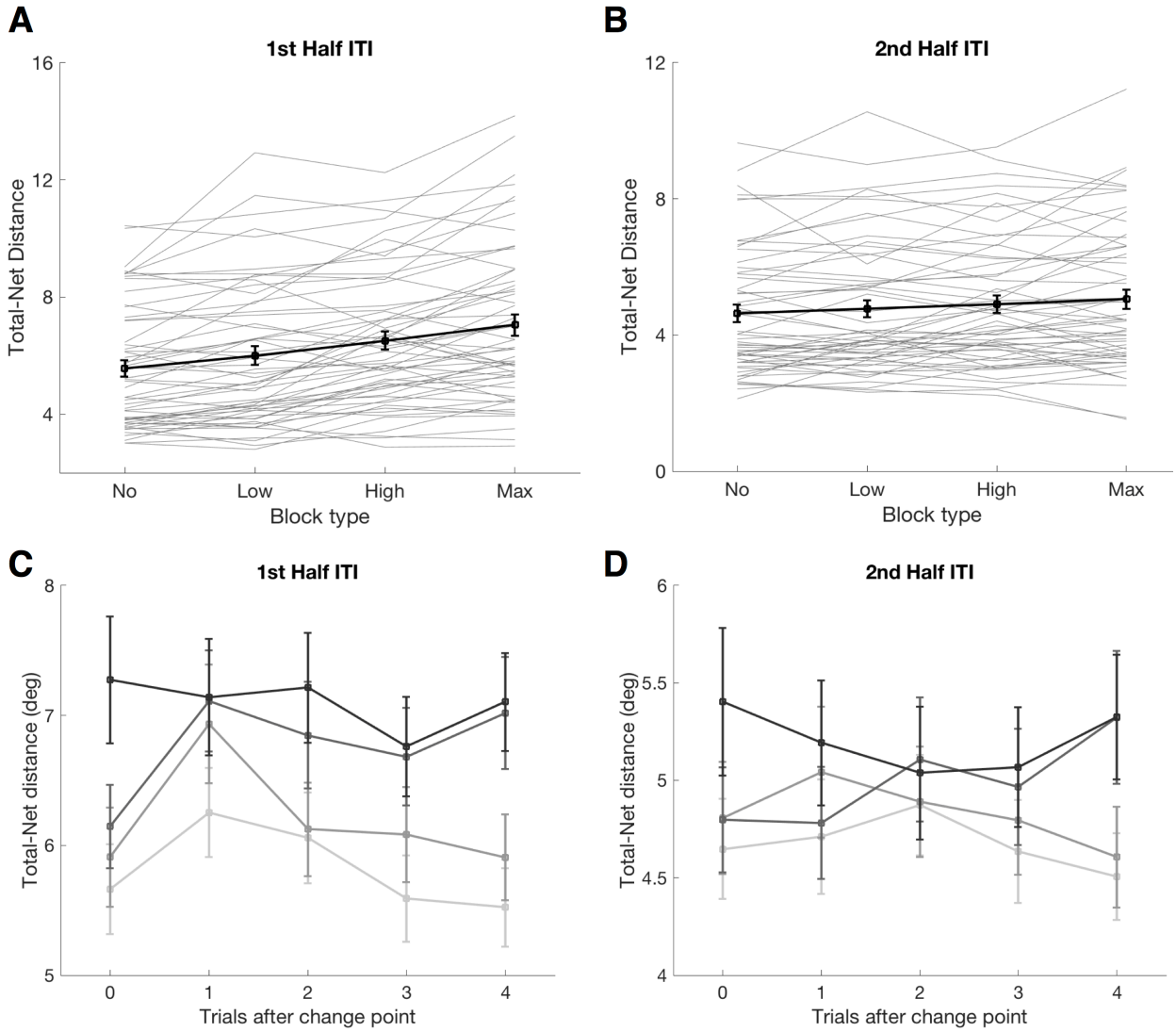
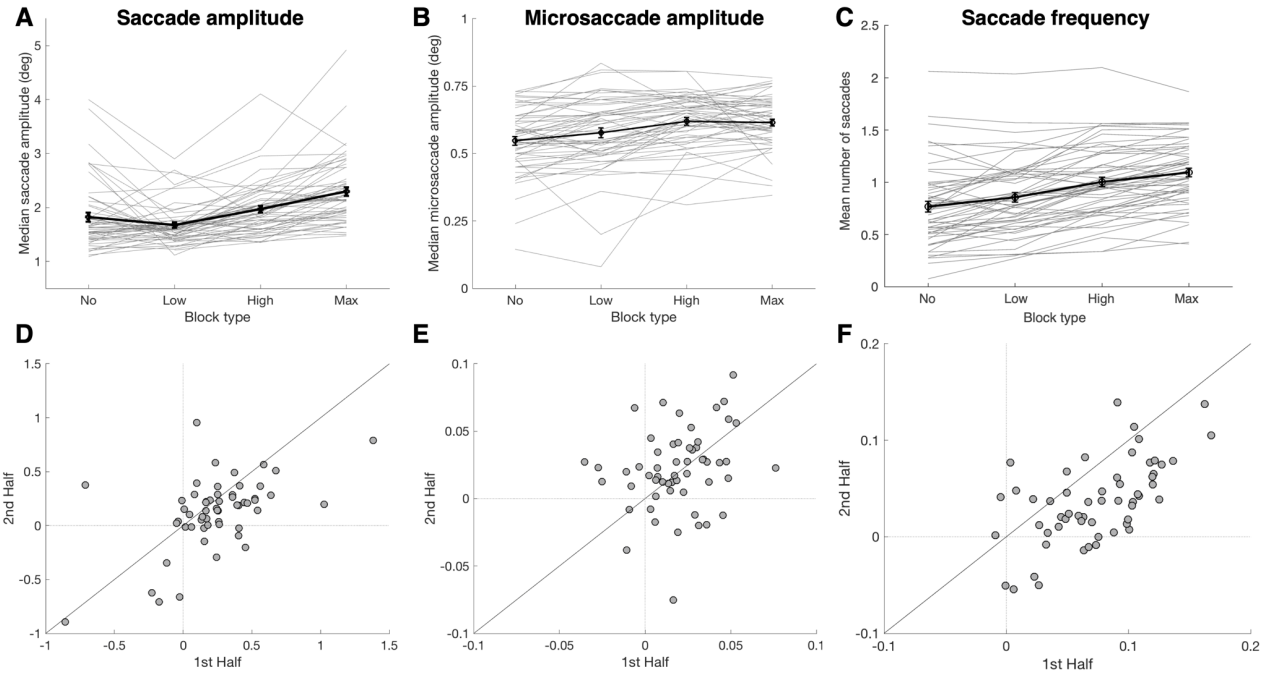


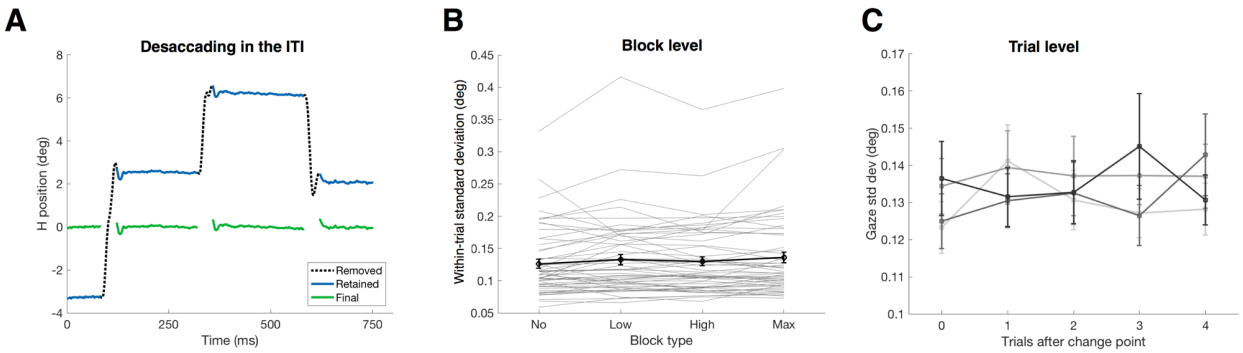
Supplemental Figure 1. Reward and oculomotor behavior. A-C: Saccade dynamics. (A) Latency and peak velocity of the first saccade following digit appearance for trials with reward available versus not. Means for each participant are indicated by grey circles; mean ± SEM shown atop in black (p = 0.060 for latency, p = 0.525 for peak velocity, Wilcoxon signed rank test). (B) The latency of the first saccade separated by block type (for each block type, left = Reward and right = No Reward). A significant difference was only seen between rewarded and unrewarded trials for the High variance condition (p = 0.049, all other p >= 0.063). (C) Same conventions as in B for peak velocity. No significant differences between rewarded and unrewarded trials (all p >= 0.151). D-F: Fixation dynamics. (D) Mean duration of the first fixation following digit onset and its gaze variability for each participant on trials with and without reward available. Gaze variability is the standard deviation of gaze position during the first fixation after digit onset. No significant differences between rewarded and unrewarded trials (p = 0.864 and 0.503, respectively). (E) Mean fixation duration separated by block type. No significant differences except for the Max condition (p = 0.011, all other p >= 0.203). (F) Mean standard deviation of the gaze position during the first fixation after digit onset, separated by block type. No significant differences were observed (all p >= 0.184).



Supplemental Figure 2. Evolution of the prediction throughout the ITI. (A) Gaze variability for all participants for the first half of the ITI. Conventions as in Figure 6B. Linear trend increased over noise level (fixed effect of block type β=0.494, CI = 0.388 to 0.600, $t(55)$=9.36, p<0.001). All pairwise comparisons were significant (all p <= 0.002, Wilcoxon signed rank test with Bonferroni correction for multiple comparisons). (B) Second half of the ITI. Conventions as in B. Linear trend was significant, but smaller magnitude (fixed effect of block type β=0.139, CI = 0.067 to 0.211, $t(55)$=3.87, p<0.001). No pairwise comparisons were significant (all p >= 0.627, Wilcoxon signed rank test with Bonferroni correction). (C) Mean gaze variability from the first half of the ITI aligned on change points. Same conventions as in Figure 6D. (D) Mean gaze variability from the second half of the ITI aligned on change points. Same conventions as in C. The Cohen's D effect size for first trial in the No, Low, and High Noise conditions were all significantly greater than zero in the first half of the ITI (all p <= 0.001, Wilcoxon signed rank test), whereas they were not different from zero in the second half (all p >= 0.392).



Supplemental Figure 3. Saccades and microsaccades in the ITI. (A) Grey lines are median saccade amplitudes during the ITI for each participant, with group means ± SEM in black. Amplitude increased with noise level (linear trend: fixed effect of block type β=0.175, CI = 0.127 to 0.224, $t(55)$=7.27, p<0.001; pairwise comparisons were significant, $p < 0.001$, Wilcoxon signed rank test with Bonferroni correction) except for No and Low Noise ($p = 0.389$ uncorrected). (B) Same conventions for microsaccades. Microsaccade amplitude also increases with noise level (fixed effect of block type β=0.024, CI = 0.017 to 0.032, $t(55)$=6.32, p<0.001; pairwise comparisons were significant $p <= 0.002$, Wilcoxon signed rank test with Bonferroni correction), except for the High and Max comparison ($p = 0.899$ uncorrected). (C) Mean number of saccades per trial during the ITI. Same conventions as A-B. Saccade frequency increased with noise level. The linear trend was significant (fixed effect of block type β=0.113,CI = 0.092 to 0.134, $t(55)$=10.82, p<0.001). Pairwise comparisons revealed that all conditions were significantly different (all $p < 0.001$, Wilcoxon signed rank test with Bonferroni correction). These effects of condition on all three factors were significant in both the first and second half of the ITI. (D) Lines were fit to each participant's saccade amplitude data for the first half and second half of the ITI separately and plotted against each other. The dotted line represents unity. The correlation between the two slopes was 0.416 (Spearman's correlation, $p = 0.002$) and each half's slopes were significantly greater than zero ($p < 0.001$, Wilcoxon signed rank test). (E) Same conventions as in D for microsaccade data. The correlation was 0.298 ($p = 0.026$), and each half's slopes were significantly greater than zero ($p < 0.001$). (F) Same conventions as in D for saccade frequency. The correlation was 0.573 ($p < 0.001$), and each half's slopes were significantly greater than zero ($p < 0.001$).



Supplemental Figure 4. Fixational gaze variability. (A) Example of the desaccading procedure in the ITI. We identified and removed all of the saccades (dotted black line) from the ITI and zeroed each remaining segment (green lines) to remove the effects of the saccade. (B) Fixational gaze variability across block types, conventions as in Figure 6B. Removing all saccades from the ITI largely removed the behavioral correlate of subjective uncertainty. Linear trend was marginally significant (fixed effect of block type β=0.003, CI = 0.0001 to 0.005, $t(55)$=2.10, p=0.040). Pairwise comparisons were not significant (p >= 0.394, Wilcoxon signed rank test with Bonferroni correction), except for the No versus Low comparison (p = 0.013). (C) Fixational gaze variability aligned on change points, conventions as in Figure 6D-E. Trialwise uncertainty effects were not seen.