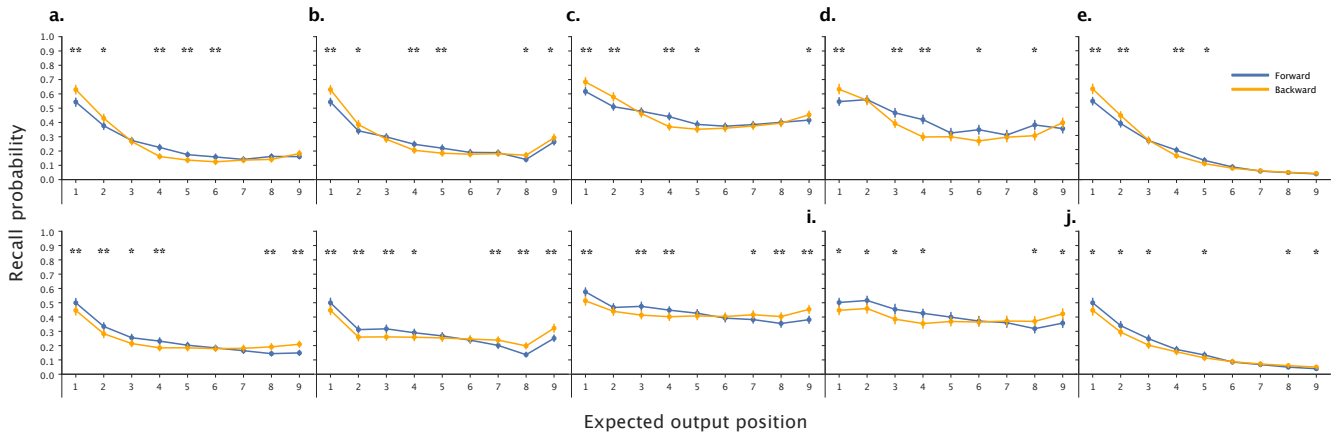


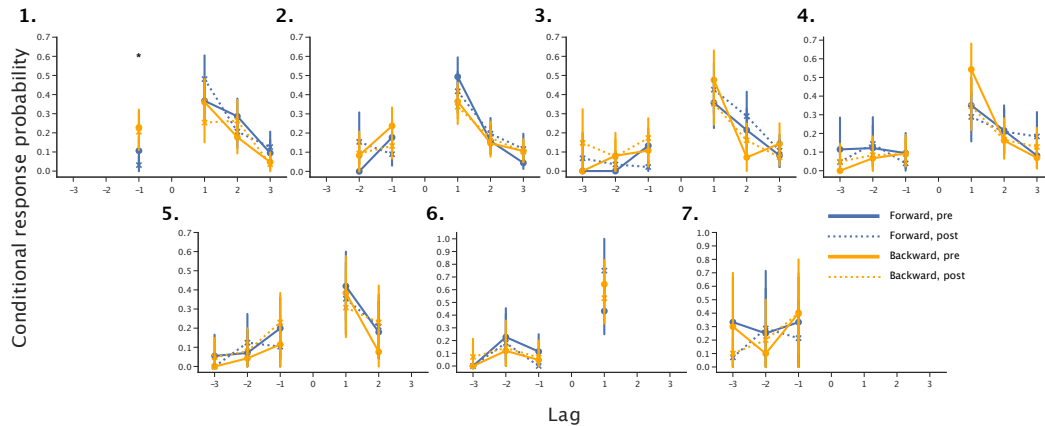
# Supplementary Materials for “Forward and Backward Recall”

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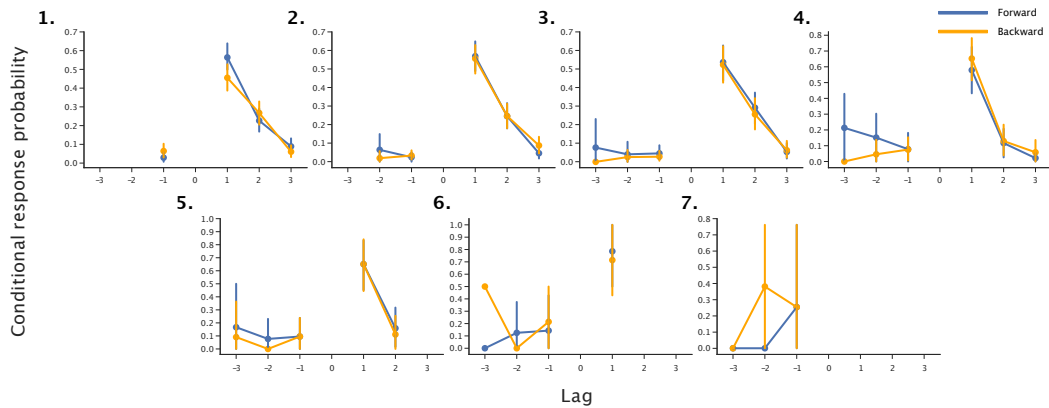
**Supplementary Figures**



**Figure 1. Expected output position effects in forward and backward recall using five different scoring methods.** The graph illustrates the probability of correctly recalling an item as a function of its expected output position (serial position for forward recall or reverse serial position for backward recall) in Experiment 1 (top row) and Experiment 2 (bottom row). Correctness was determined using the following methods: **a., f.** the relative order method of Solway et al. (2012), **b., g.** the relative order method of Drewnowski & Murdock (1980), **c., h.** free recall scoring, **d., i.** conditional order scoring, and **e., j.** strict positional scoring. Significance markers represent results of paired t-tests on recall probability in forward vs. backward recall at each expected output position. ★ indicates  $p < 0.05$ , ★★ indicates  $p < 0.001$  after conducting an FDR test for multiple comparisons (within an experiment and scoring method). Error bars indicate 95% confidence intervals, calculated using 1000 iterations of bootstrapped resampling of the data.



**Figure 2. Temporal clustering for each expected output position following the first order error (Exp. 1).** Probability of recalling an item as a function of its lag (distance, in items) from the just-recalled item at each expected output position following the first order error. Each panel illustrates conditional response probabilities for each of the four experimental conditions: forward pre-cued, forward post-cued, backward pre-cued, and backward post-cued. Significance markers represent results of paired t-tests on the probability of fill-in ( $lag = -1$ ) transitions in forward vs. backward recall at each expected output position following the first order error. ★ indicates  $p < 0.05$ , ★★ indicates  $p < 0.001$  after conducting an FDR test for multiple comparisons. Error bars indicate 95% confidence intervals, calculated using 1000 iterations of bootstrapped resampling of the data.



*Figure 3. Temporal clustering for each expected output position following the first order error (Exp. 2).* Probability of recalling an item as a function of its lag (distance, in items) from the just-recalled item at each expected output position following the first order error. Each panel illustrates conditional response probabilities for forward and backward recall. Paired t-tests conducted on the probability of fill-in ( $lag = -1$ ) transitions following the first order in forward vs. backward recall did not result in significant differences at any expected output position following an FDR test for multiple comparisons. Error bars indicate 95% confidence intervals, calculated using 1000 iterations of bootstrapped resampling of the data.

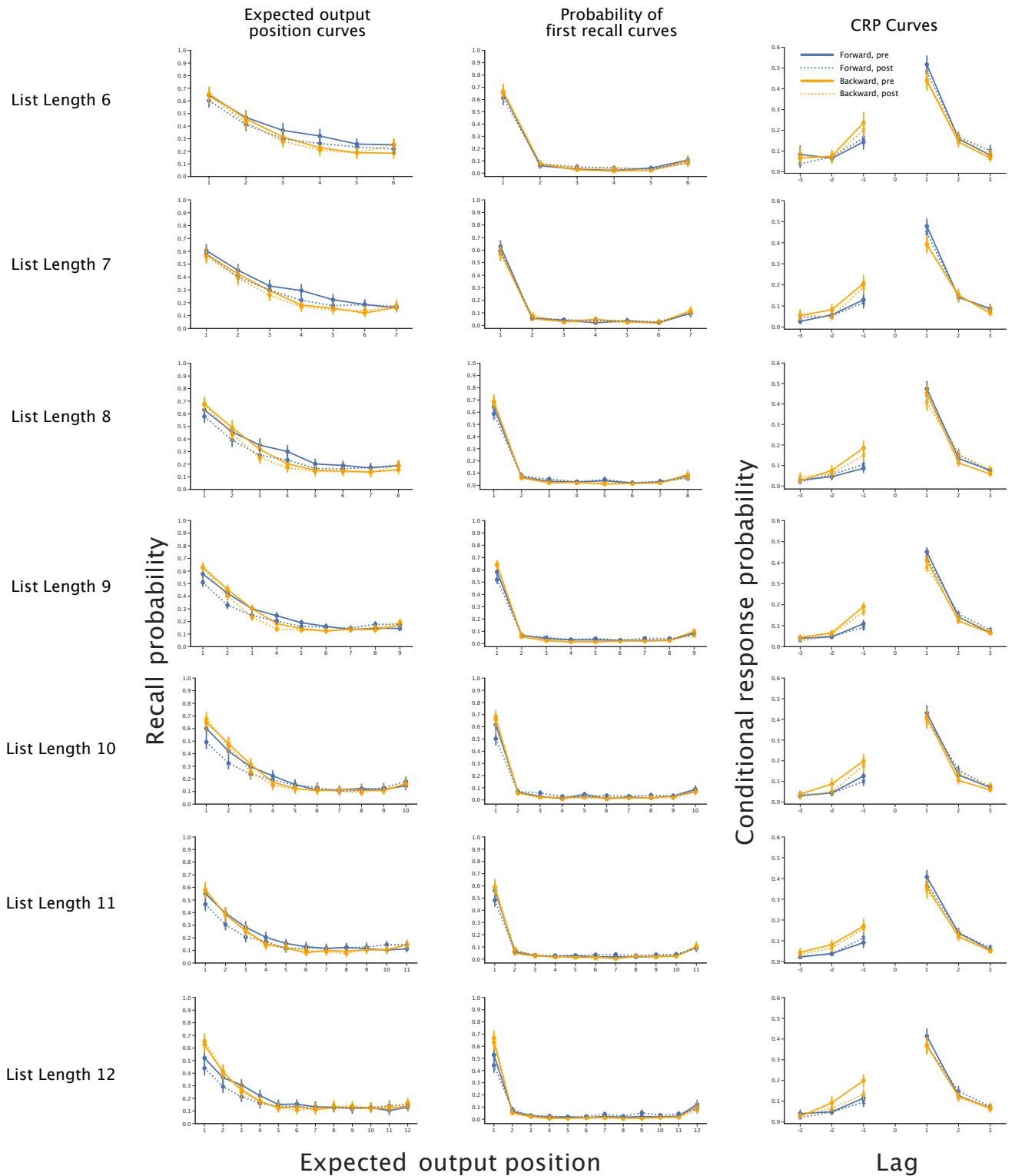
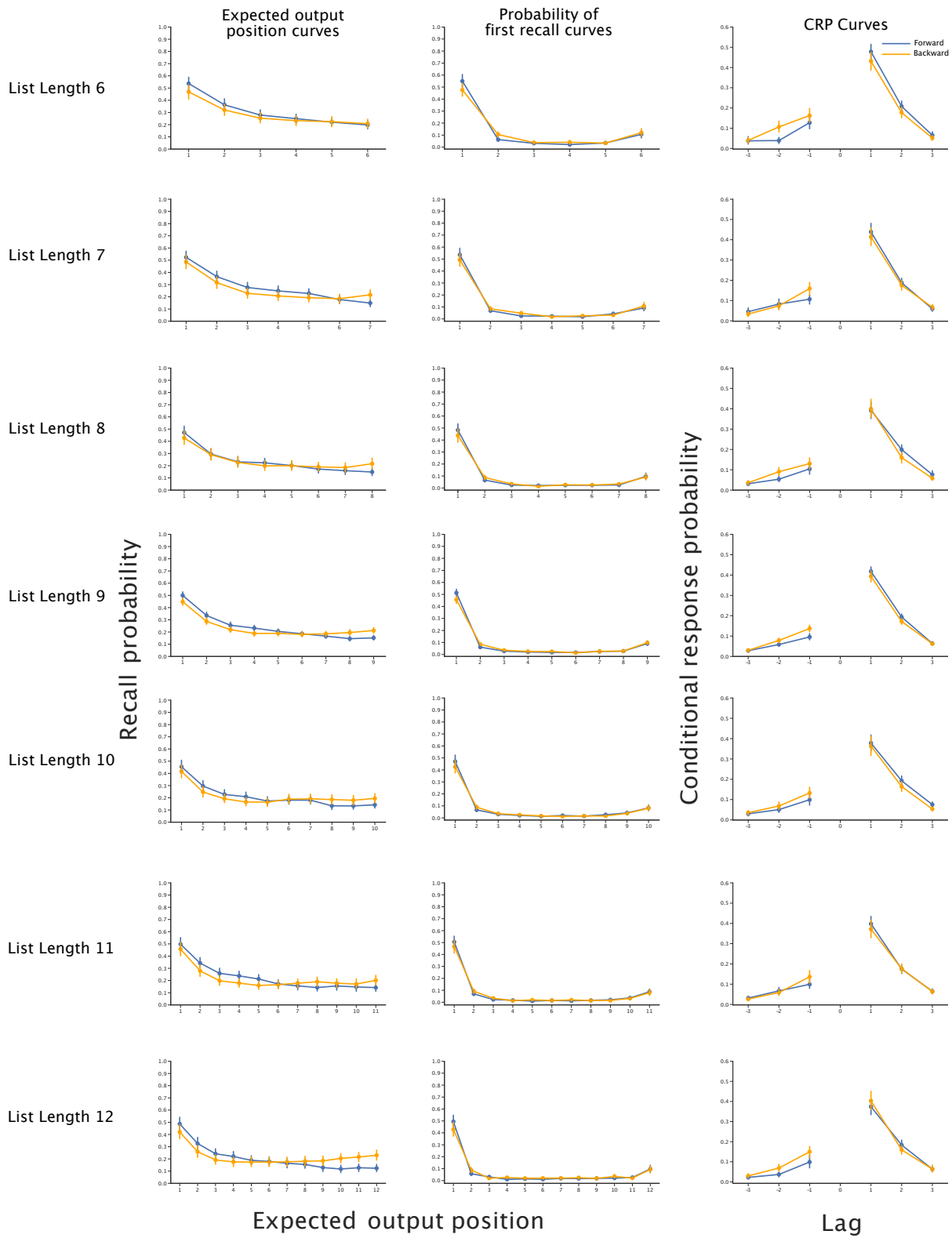


Figure 4. Expected output position, initiation, and conditional response probability analyses for all list lengths (Exp. 1). Each row shows data from one list length tested in Experiment 1. The left column replicates the analysis conducted in Figure 1b for all tested list lengths. The center column replicates Figure 2 and the right column replicates Figure 3a. Error bars indicate 95% confidence intervals, calculated using 1000 iterations of bootstrapped resampling of the data.



**Figure 5. Expected output position, initiation, and conditional response probability analyses for all list lengths (Exp. 2).** Each row shows data from one list length tested in Experiment 2. The left column replicates the analysis conducted in Figure 1b for all tested list lengths. The center column replicates Figure 2, and the right column replicates Figure 3a. Error bars indicate 95% confidence intervals, calculated using 1000 iterations of bootstrapped resampling of the data.