Supplementary materials for: Feature and order manipulations in a free recall task affect memory for current and future lists

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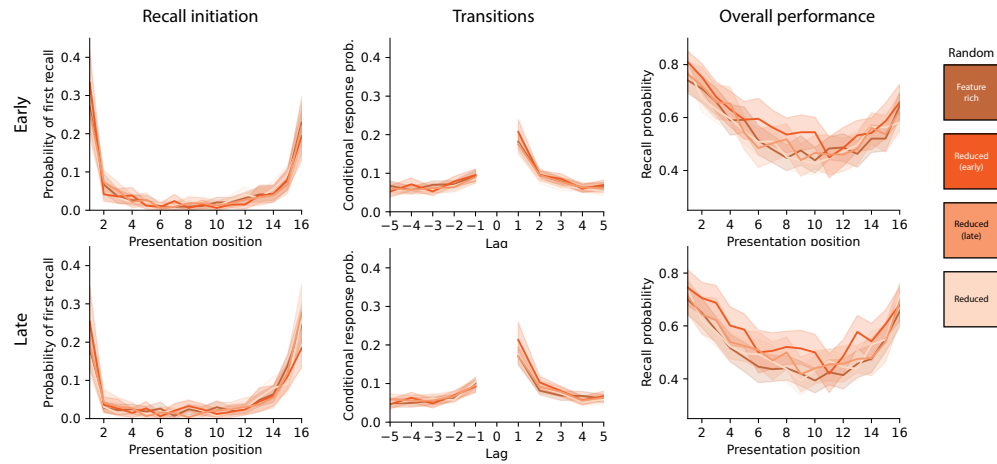
Supplementary Figure S1: Recall dynamics in feature rich free recall (random conditions). Left panels. The probabilities of initiating recall with each word are plotted as a function of presentation position. **Middle panels.** The conditional probabilities of recalling each word are plotted as a function of the relative position (Lag) to the words recalled just-prior. **Right panels.** The overall probabilities of recalling each word are plotted as a function of presentation position. **All panels.** Error ribbons denote bootstrap-estimated 95% confidence intervals (calculated across participants). Top panels display the recall dynamics for early (order manipulation) lists in each condition (color). Bottom panels display the recall dynamics for late (randomly ordered) lists.
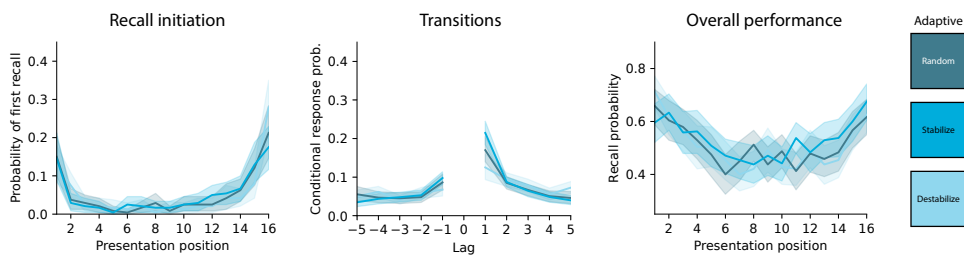

Supplementary Figure S2: Recall dynamics in feature rich free recall (adaptive conditions). Left panel. The probabilities of initiating recall with each word are plotted as a function of presentation position. **Middle panel.** The conditional probabilities of recalling each word are plotted as a function of the relative position (Lag) to the words recalled just-prior. **Right panel.** The overall probabilities of recalling each word are plotted as a function of presentation position. **All panels.** Error ribbons denote bootstrap-estimated 95% confidence intervals (calculated across participants). Condition is denoted by color.
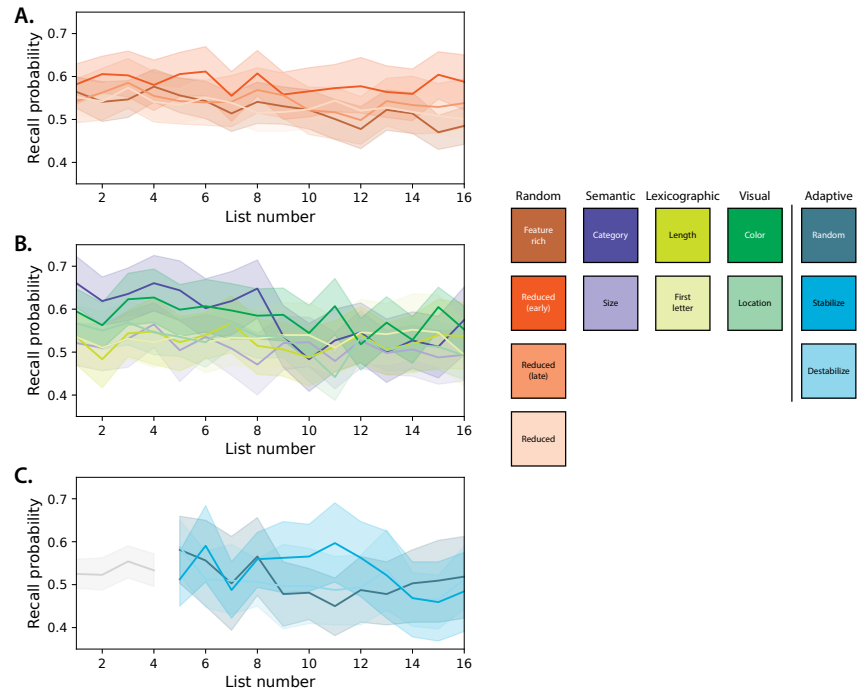
Supplementary Figure S3: Recall accuracy by study list number. Each panel displays the average recall accuracy (across participants) as a function of the number of studied lists for the random conditions (**A.**), order manipulation conditions (**B.**), and adaptive conditions (**C.**). The conditions are denoted by color. Note that the first four lists in all of the "adaptive" conditions were ordered randomly to compute a baseline fingerprint for each participant prior to initiating the adaptive ordering procedure. **All panels.** All error ribbons denote bootstrap-estimated 95% confidence intervals, calculated across participants.
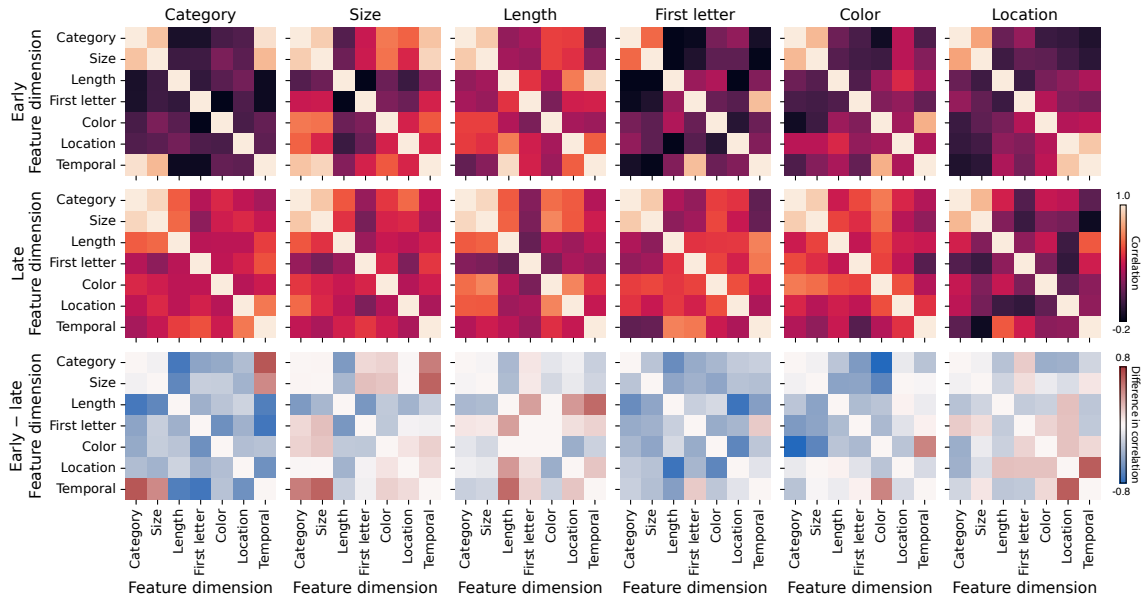
Supplementary Figure S4: Correlations between feature clustering scores (order manipulation conditions). Each column reflects one experimental condition. The matrices in the top and middle rows display across-participant correlations between clustering scores for each feature dimension (top: order manipulation lists; middle: randomly ordered lists). The matrices in the bottom rows display the differences between the top and middle rows.
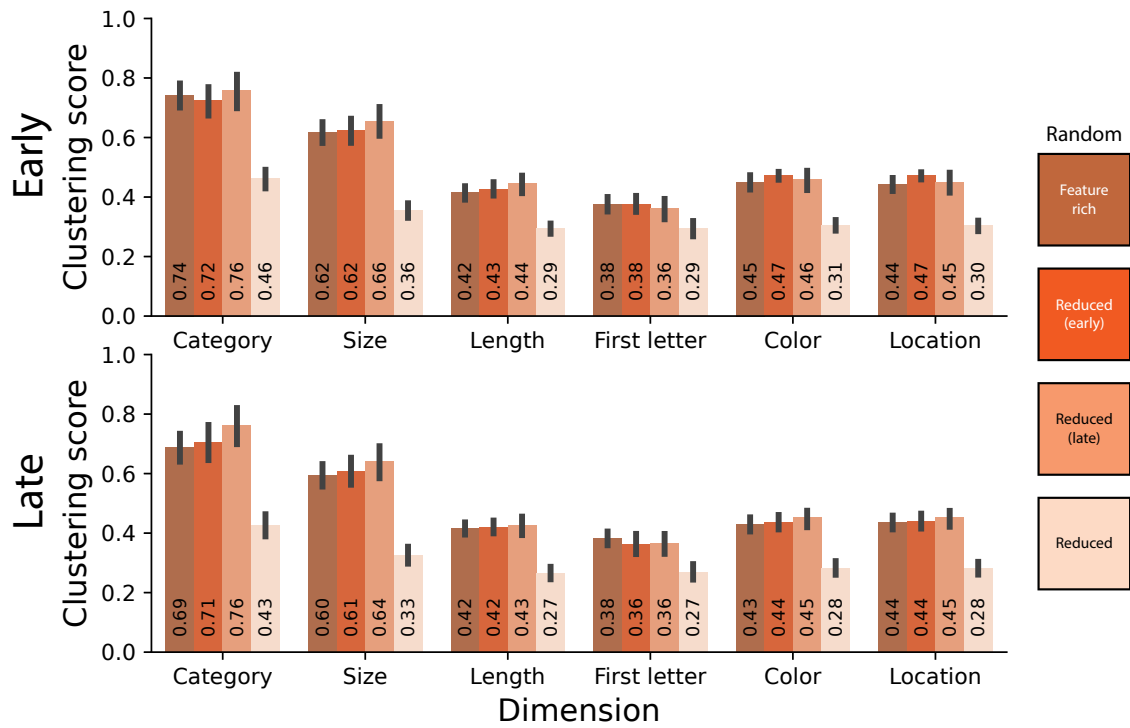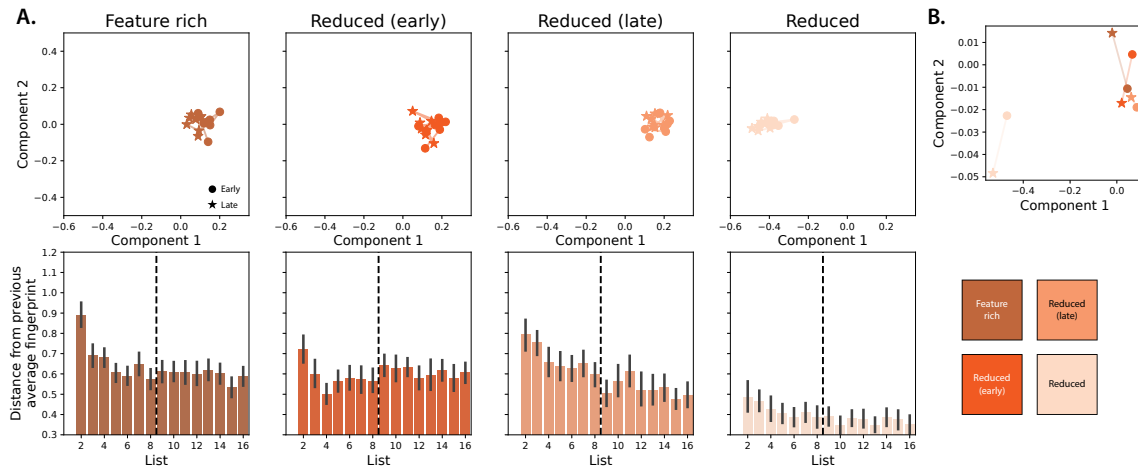
Supplementary Figure S5: Memory "fingerprints" (random conditions). The across-participant clustering scores for each feature type (*x*-axis) are displayed for each experimental condition (color), separately for early (top) and late (bottom) lists. Error bars denote bootstrap-estimated 95% confidence intervals.
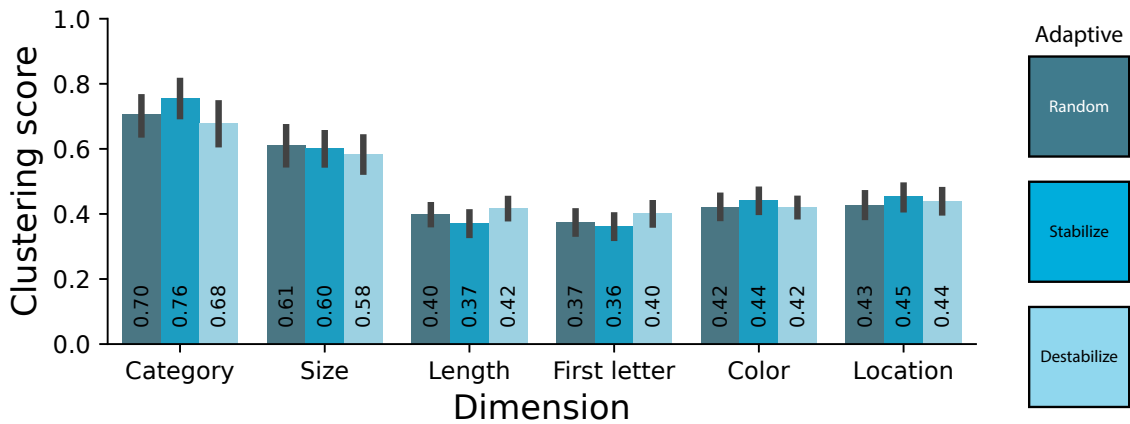

Supplementary Figure S6: Memory "fingerprints" (adaptive conditions). The across-participant clustering scores for each feature type (*x*-axis) are displayed for each experimental condition (color). Error bars denote bootstrap-estimated 95% confidence intervals.
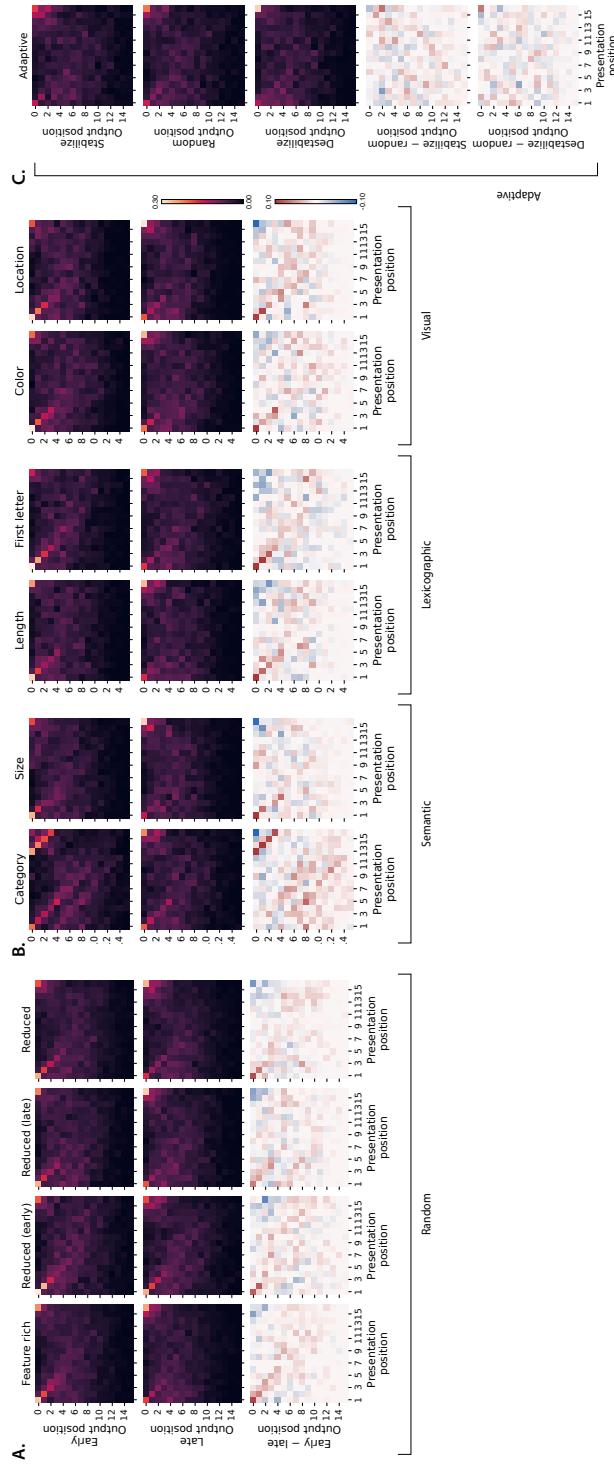
Supplementary Figure S7: Probability of nth recall matrices. Each sub-panel displays the average probability of recalling the given word (Presentation position, matrix column) at the given output position (matrix row); color denotes the probability. **A. Random conditions.** The top rows of matrices display data from early (order manipulation) lists, the middle rows of matrices display data from late (randomly ordered) lists, and the bottom rows of matrices display the differences between the matrices in the top and middle rows. Panel columns denote experimental conditions. **B. Order manipulation conditions.** The matrices are displayed in the same format as those in Panel A. Panel columns are organized by feature type (semantic, lexicographic, or visual). **C. Adaptive conditions.** The sub-panels are displayed in the same formats as Panels A and B, but here the matrices and contrasts (indicated in y-axis labels) reflect different list manipulation conditions.

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Supplementary Figure S8: Memory fingerprint dynamics (random conditions). A. Each column (and color) reflects an experimental condition. In the top panels, each marker displays a 2D projection of the (across-participant) average memory fingerprint for one list. Early lists are denoted by circles and late lists are denoted by stars. All of the fingerprints (across all conditions and lists) are projected into a common space. The bar plots in the bottom panels display the Euclidean distances of the per-list memory fingerprints to the average fingerprint across all prior lists, for each condition. Error bars denote bootstrap-estimated 95% confidence intervals. The dotted vertical lines denote the boundaries between early and late lists. **B.** In this panel, the fingerprints for early (circle) and late (star) lists are averaged across lists and participants before projecting the fingerprints into a (new) 2D space.
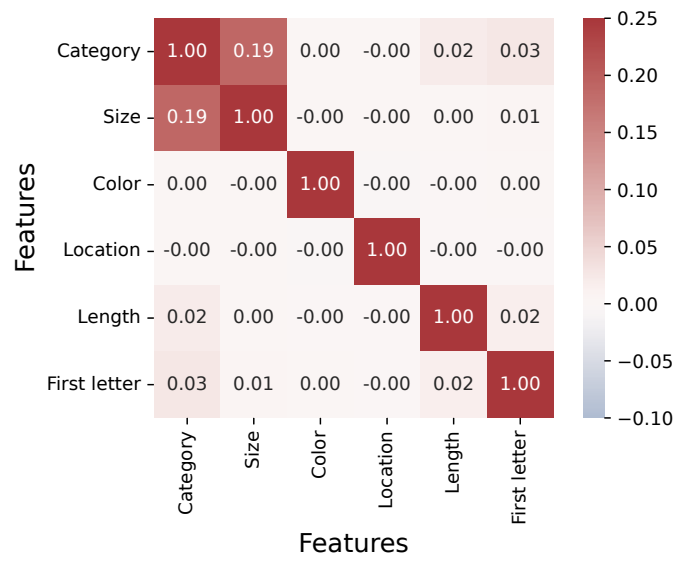
Supplementary Figure S9: Correlations between features. Within each list, for each participant, we computed the set of distances between each pair of words, along each feature dimension. We then combined these pairwise distances across all lists and participants, and computed the Spearman correlation between the distances for each pair of feature dimensions. The correlation coefficients are displayed in the heatmap, annotated with each cell's value.