

Figure S1: Optimizing topic model parameters. We performed a grid search over video sliding window length ($\omega \in \{5, 10, 25, 50, 100\}$), recall sliding window length ($\rho \in \{5, 10, 25, 50, 100\}$), and number of topics ($K \in \{5, 10, 25, 50, 100\}$). The reported correlations are between per-subject video-recall trajectory correlations and per-subject hand-annotated memory performance ratings.

Topic ID	Top 10 words	Topic description
1	sir, jeffrey, indoor, yes, office, building, aide, helen, lestrade, medium	The first death
2	sherlock, john, outdoor, taxi, yes, medium, road, says, phone, continues	John being followed (a)
3	sherlock, john, donovan, medium, lauriston, gardens, anderson, street, outdoor, lestrade	Discussing the fourth death
4	lestrade, donovan, room, indoor, press, conference, police, medium, reporter, reporters	Press conference (a)
5	john, man, yes, warehouse, indoor, medium, shoulder, says, hand, asks	Meeting with Mycroft (a)
6	sherlock, lestrade, john, indoor, medium, gardens, lauriston, room, floor, crime	Examining a body (a)
7	john, road, brixton, outdoor, phone, box, yes, medium, man, camera	John being followed (b)
8	john, sherlock, street, medium, baker, indoor, says, mrs, hudson, 221b	221b Baker St. (a)
9	john, donovan, lauriston, gardens, yes, street, medium, outdoor, shoulder, policeman	Consulting with the police
10	lestrade, donovan, indoor, room, medium, aide, press, conference, police, reporter	Press conference (b)
11	john, mike, lestrade, medium, donovan, park, indoor, square, russell, outdoor	Exposition
12	john, sherlock, medium, street, baker, anthea, indoor, yes, 221b, suite	Bringing John back
13	sherlock, john, st, bartholomew, hospital, indoor, medium, molly, mike, laboratory	John meets Sherlock (a)
14	john, man, yes, anthea, medium, warehouse, indoor, car, road, outdoor	Kidnapping John
15	john, mike, sherlock, medium, molly, park, russell, square, outdoor, bench	John runs into an old friend
16	jimmy, yes, indoor, donovan, medium, aide, gary, lestrade, press, conference	The second death (a)
17	sherlock, john, crime, scene, room, floor, lauriston, gardens, indoor, lestrade	Examining a body (b)
18	sherlock, john, mrs, hudson, baker, street, 221b, indoor, suite, yes	221b Baker St. (b)
19	john, jeffrey, sir, indoor, yes, medium, psychotherapist, helen, office, london	John's psychotherapy appointment
20	john, sherlock, yes, laboratory, indoor, hospital, bartholomew, st, medium, mike	John meets sherlock (b)
21	sherlock, lestrade, indoor, yes, room, floor, gardens, lauriston, scene, crime	Examining a body (c)
22	john, indoor, room, medium, psychotherapist, yes, soldiers, close, london, outdoor	John's PTSD
23	yes, jeffrey, sir, jimmy, aide, indoor, medium, woman, helen, man	Press conference (c)
24	sherlock, john, suite, street, 221b, baker, indoor, medium, says, asks	221b Baker St. (c)
25	man, john, warehouse, indoor, yes, shoulder, medium, says, continues, looks	Meeting with Mycroft (b)
26	jimmy, yes, gary, sir, jeffrey, medium, indoor, outdoor, psychotherapist, rain	The second death (b)
27	sherlock, john, indoor, street, baker, medium, 221b, suite, yes, phone	221b Baker St. (d)

Figure S2: Topics discovered in *Sherlock*. We applied a topic model to hand-annotated information about 1000 scenes spanning the 45 minute episode. We identified 27 unique topics with non-zero weights (we used $K = 100$ topics to fit the model). Each topic comprises a distribution of weights over all words in the vocabulary. For each topic, we show the words with the 10 largest weights, along with a suggested description of the topic.

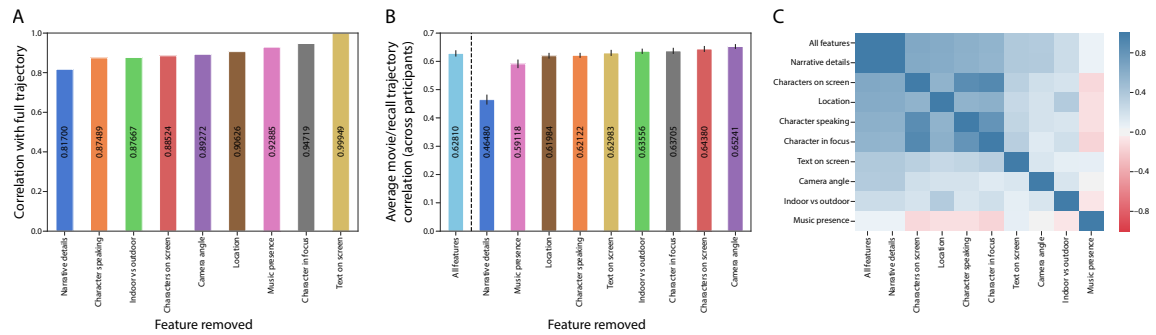


Figure S3: Feature importance analysis. **A.** Contributions of each feature type to the structure of the video trajectory. The bar heights reflect the correlation between the video trajectory computed using all features with a video trajectory computed using all features except the indicated feature. (Lower bars reflect features that contribute more substantially to the video trajectory's shape.) **B.** Which features are preserved during recall? The bar heights reflect the (average) across-participant correlations between the video and recall trajectories. Error bars denote bootstrap-estimated standard error of the mean. **C.** Feature correlation matrix. Each entry displays the correlation between video topic trajectories created using only the indicated (row/column) features.

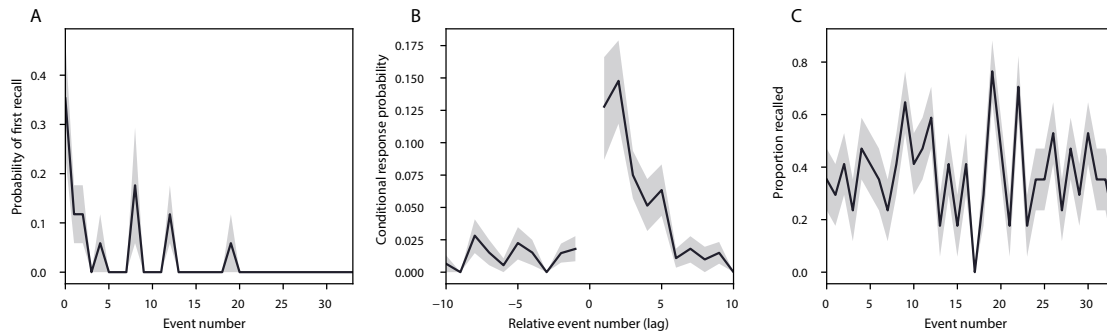


Figure S4: Naturalistic extensions of classic list-learning memory analyses. **A.** The probability of first recall as a function of the serial position of the event in the video. **B.** The probability of recalling each event, conditioned on having most recently recalled the event *lag* events away in the video. **C.** The proportion of participants who recalled each event, as a function of the serial position of the events in the video. All panels: error bars denote bootstrap-estimated standard error of the mean.

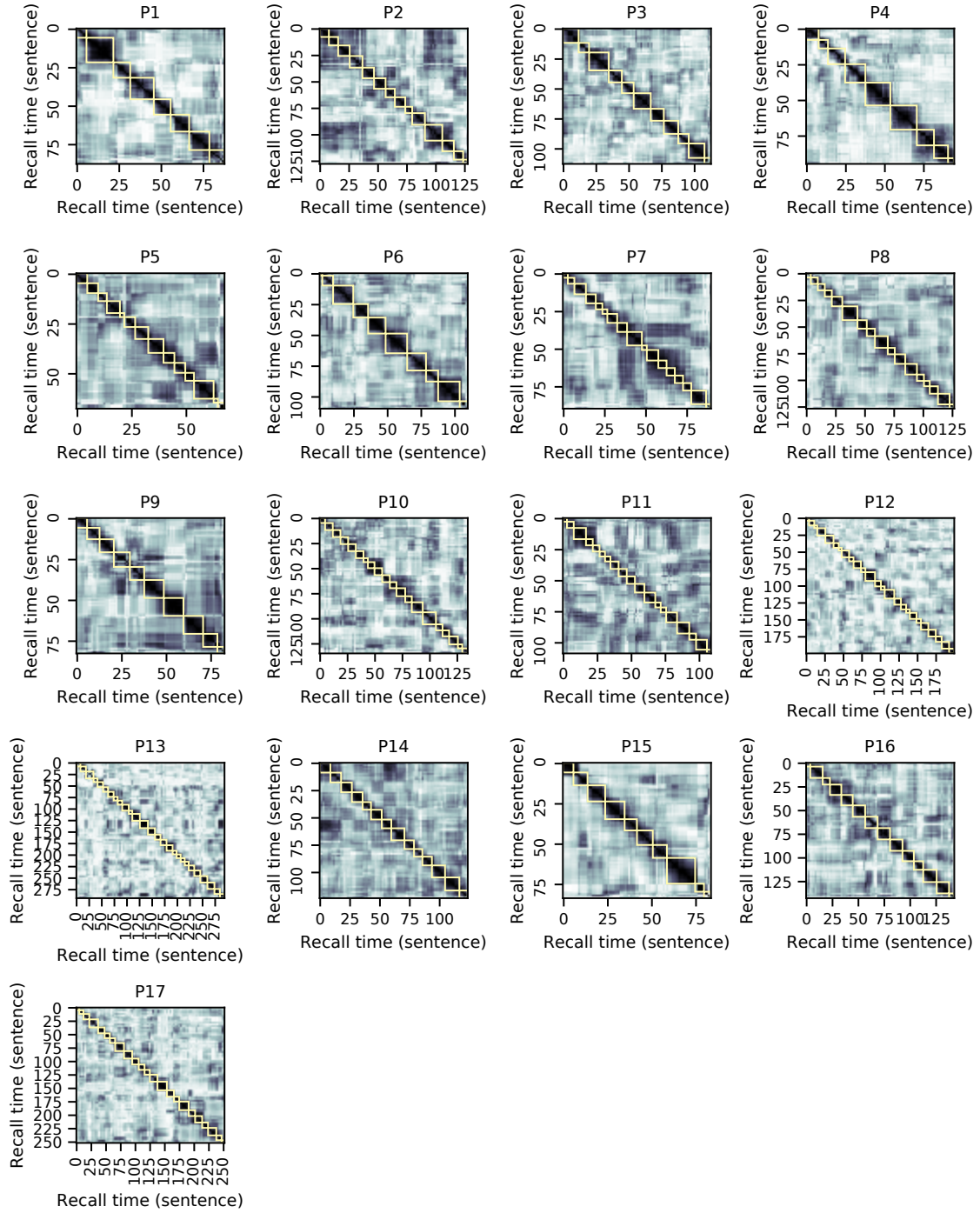


Figure S5: Recall trajectory temporal correlation matrices and event segmentation fits. Each panel is in the same format as Figure 2E in the main text. The yellow boxes indicate HMM-identified event boundaries.

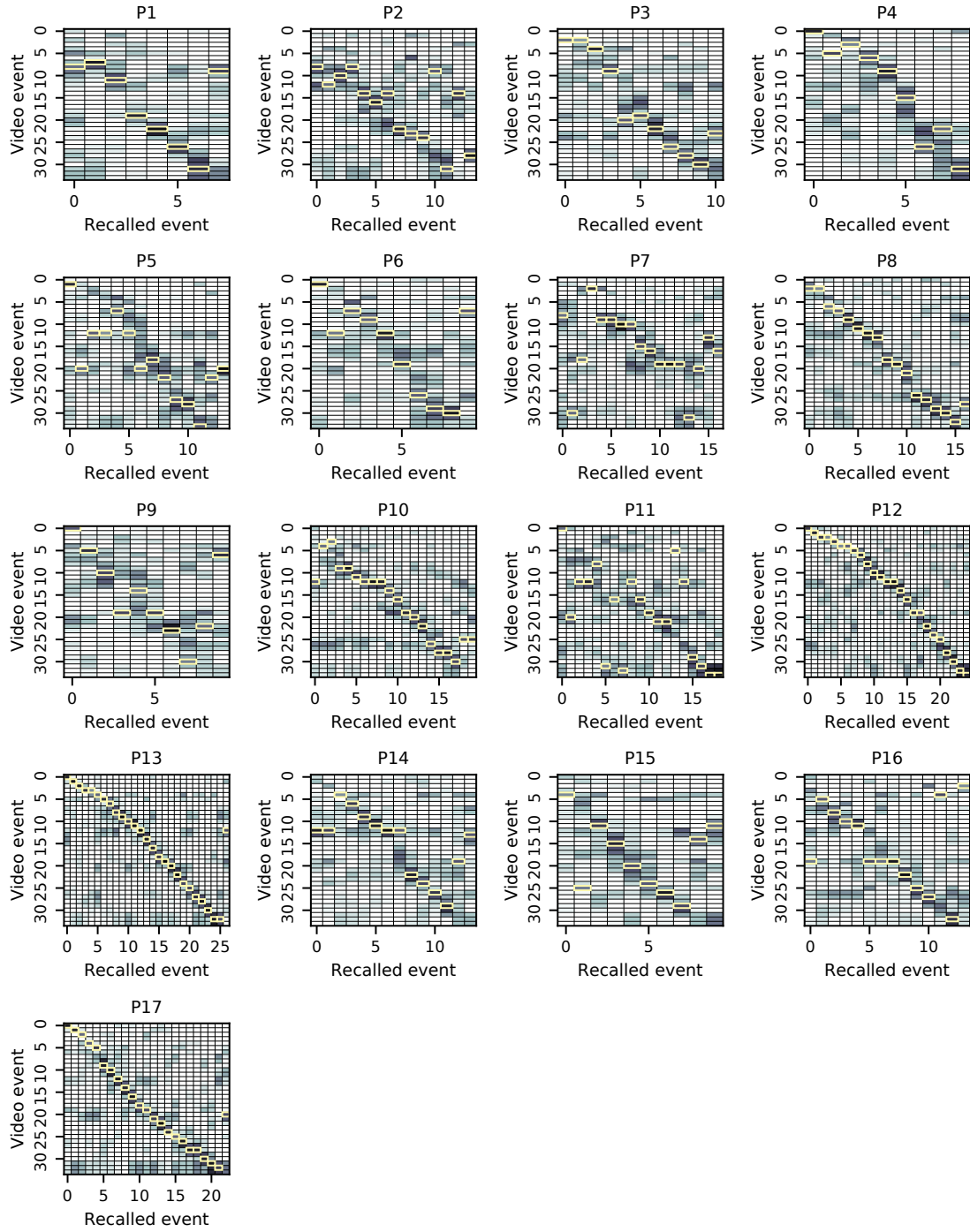


Figure S6: Video-recall event correlation matrices. Each panel is in the same format as Figure 2G in the main text. The yellow boxes mark the maximum correlation in each column.