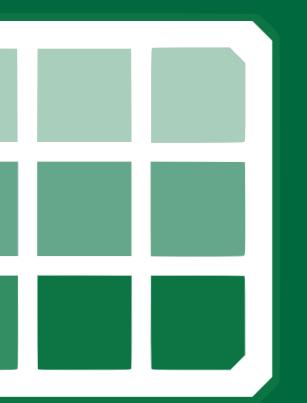




DARTMOUTH

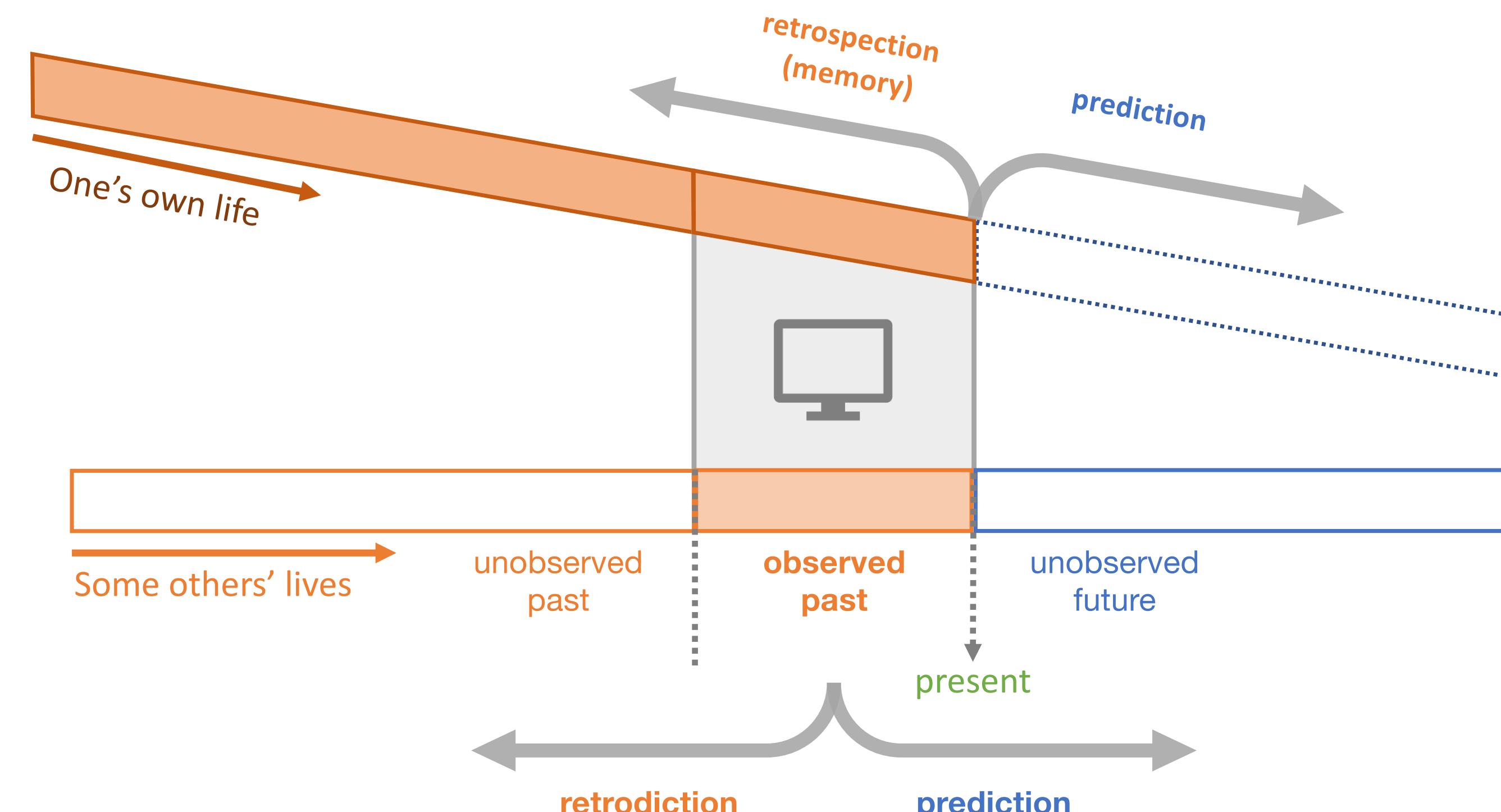
Extrapolating the unobserved past and future in other people's autobiographical timelines



Xinming Xu¹, Ziyan Zhu², and Jeremy R. Manning¹
¹Dartmouth College ²Peking University, China

Contextual Dynamics Laboratory

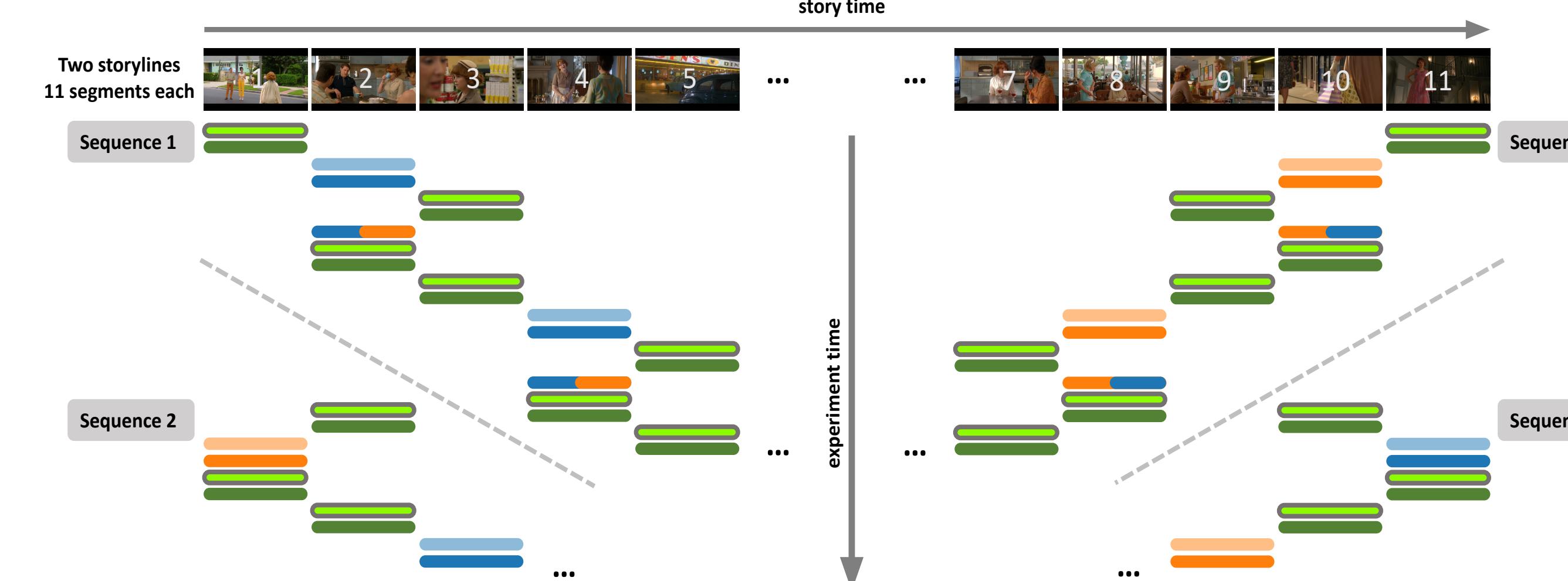
Introduction



- We readily make inferences about what happened to other people in their past, and what will happen in their future.
- For stationary processes (e.g., Markov processes), the present state contains equal amount of information about the past and the future (in terms of mutual information).
- When we only observe the present of other people's lives, do we know more about their past or more about their future?

Methods

Task design

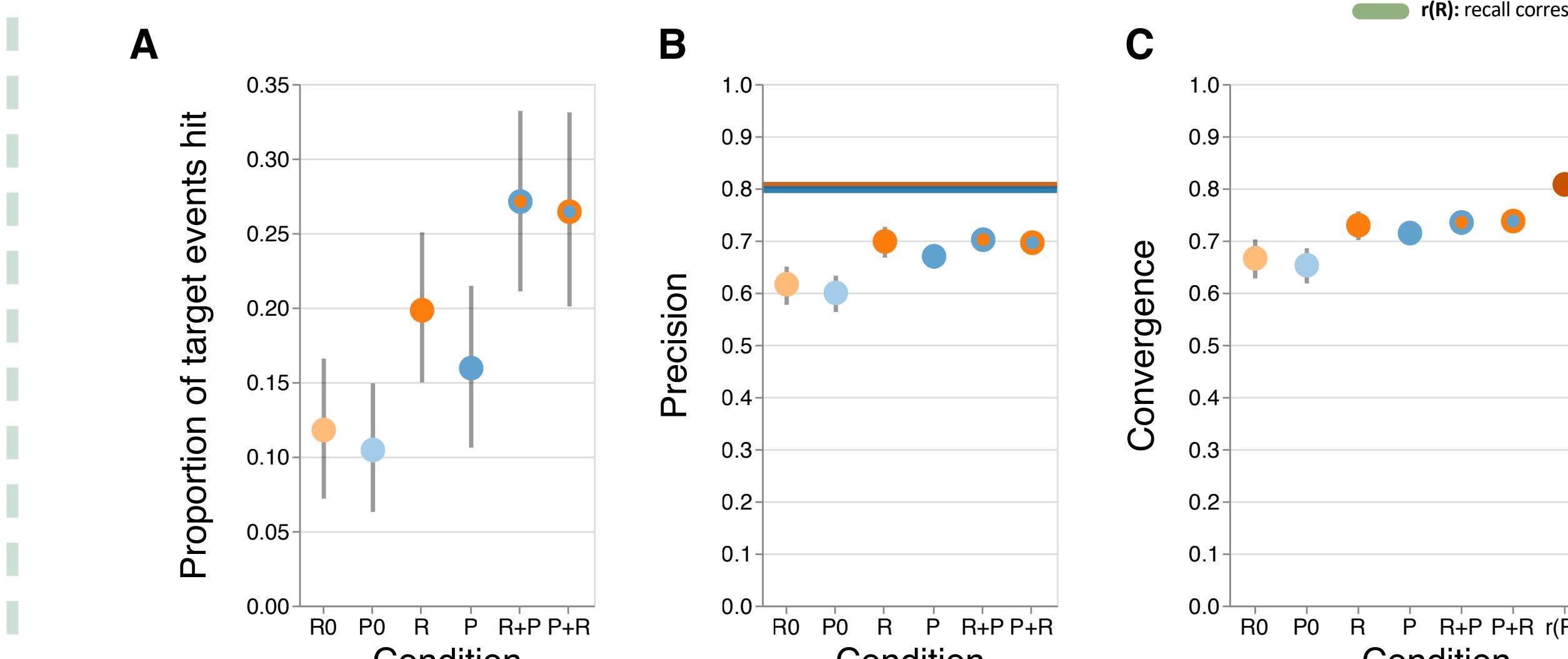
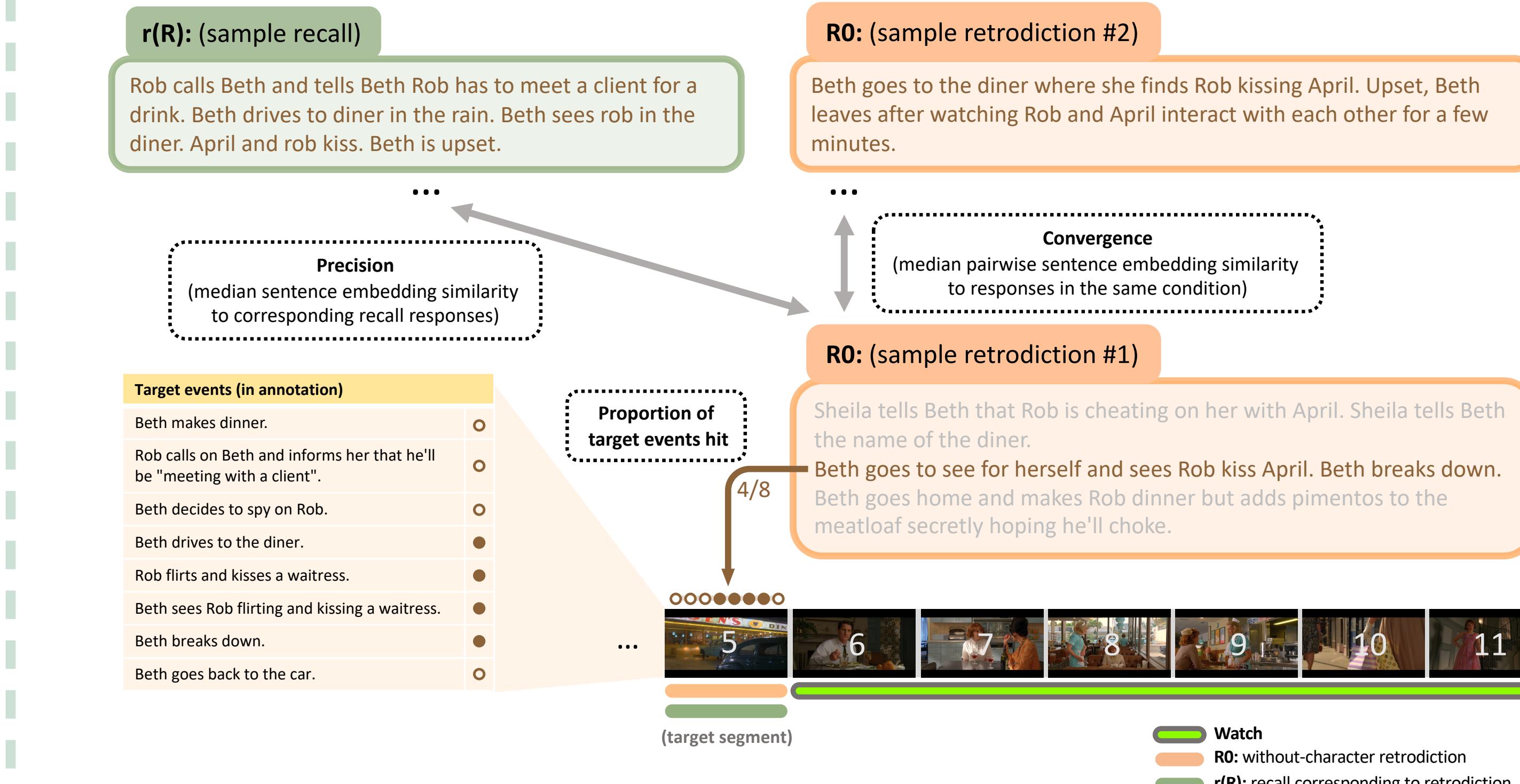


Conditions

Watch	PO: without-character prediction
P0: with-character prediction	P: with-character prediction
P+R: updated prediction (after watching one segment later)	R: with-character retrodiction
RO: without-character retrodiction	R+P: updated retrodiction (after watching one segment earlier)
Recall	r(P): Recall corresponding to 'P'
	r(R): Recall corresponding to 'R'

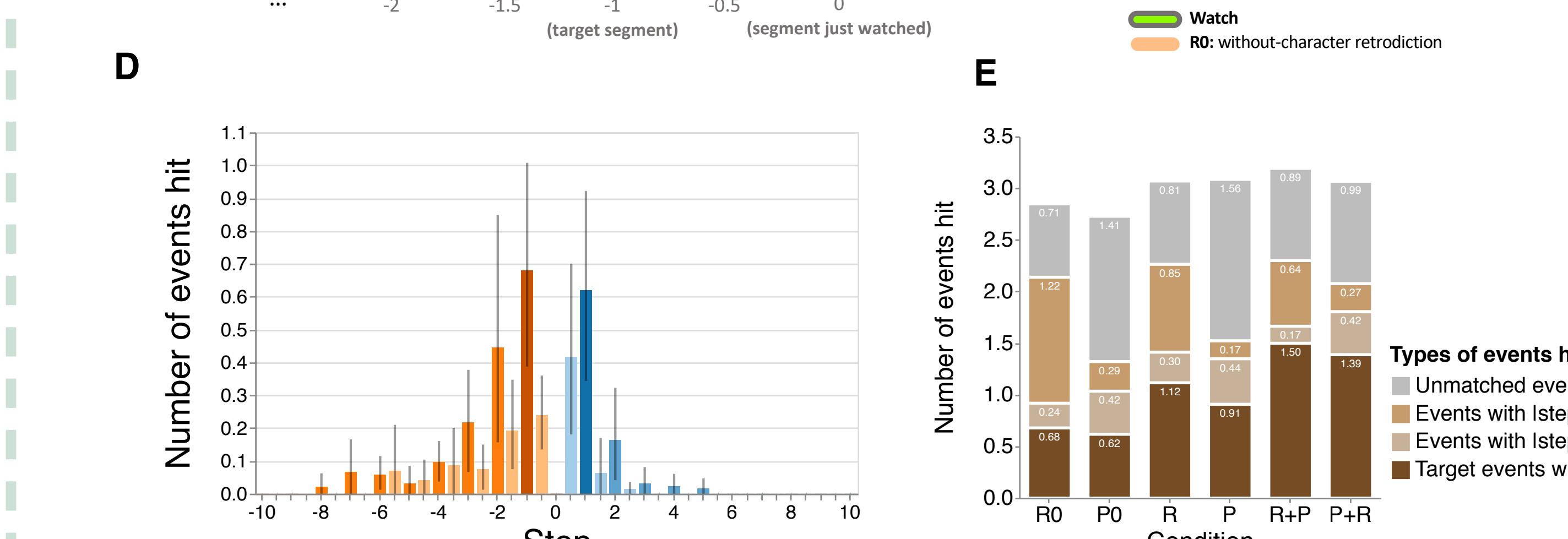
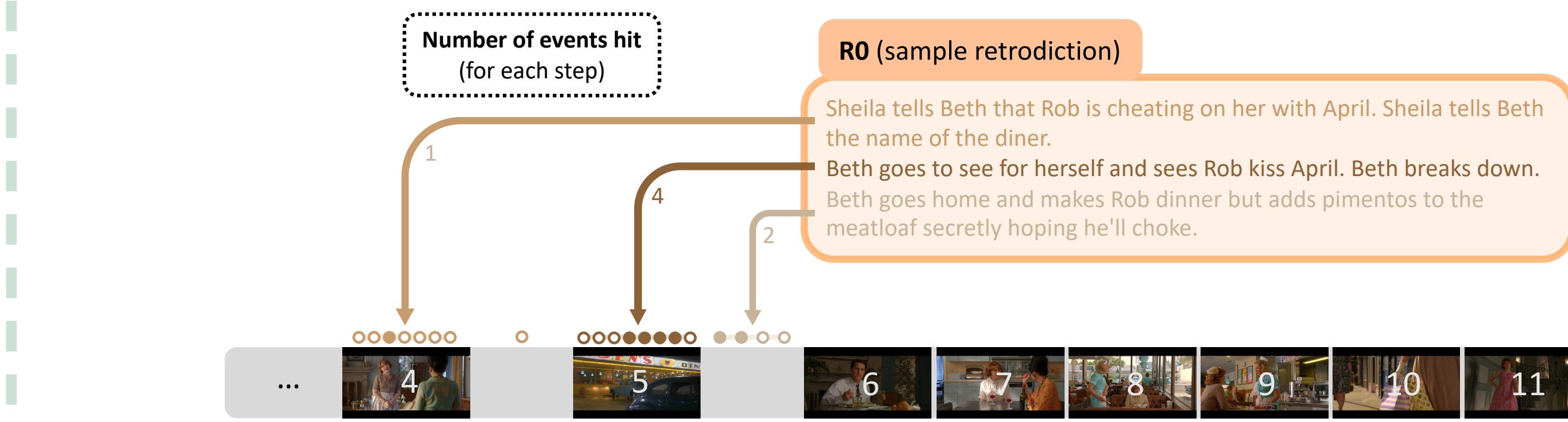
- Participants watched sequences of segments excerpted from the TV series and used free-form text responses to either predict what would happen next, or retrodict what had happened just prior, to the just-watched segment.

Retrodictions were generally better than predictions

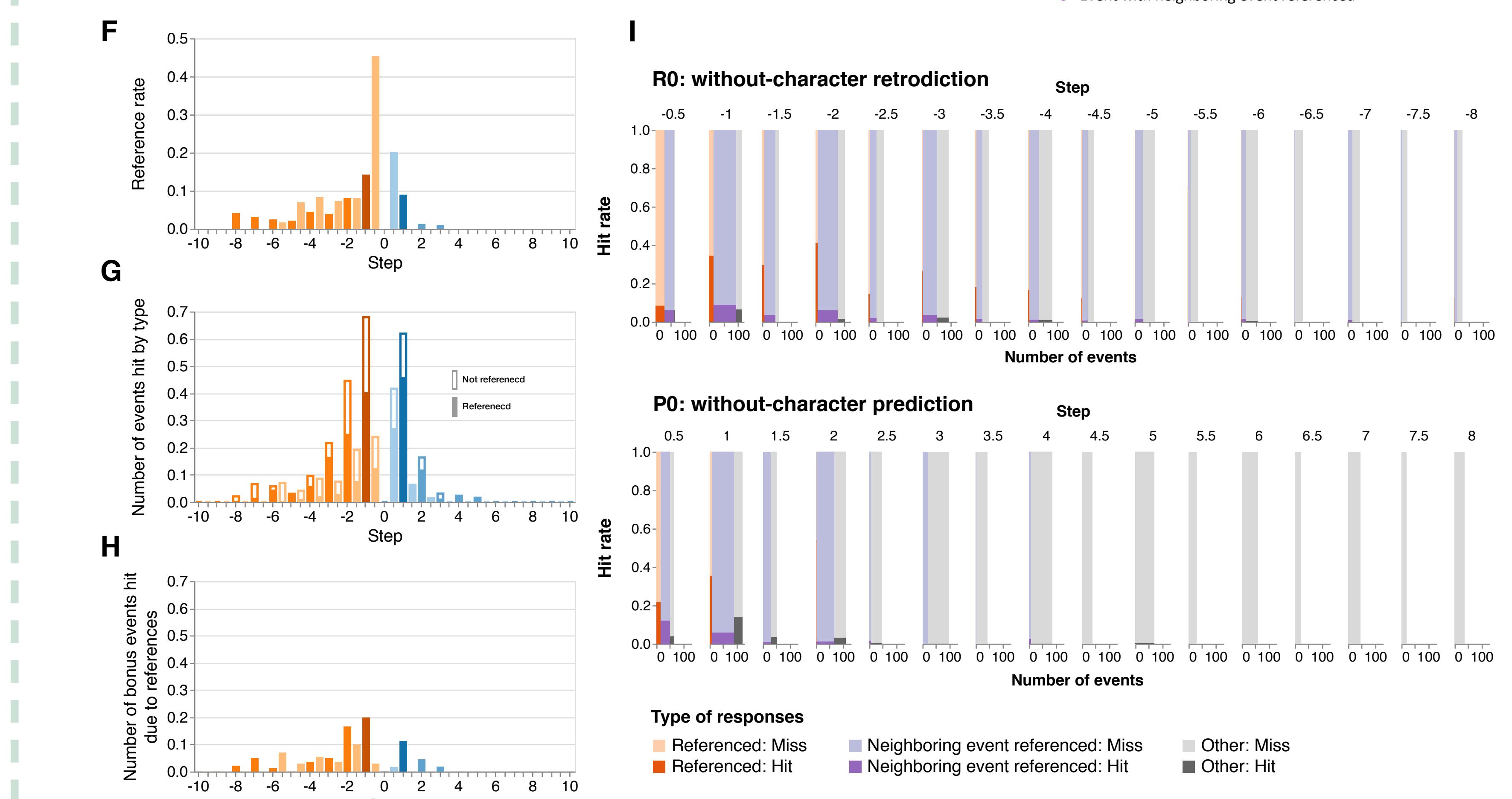


- Retrodictions contained more target events and were more semantically similar to actual recalls than predictions.

Participants also hit more distant past events than distant future events



Conversational references in the movie could explain the asymmetry



- In the movie, characters referred to their past lives more than their future lives in conversations.
- Referenced events had higher hit rates than non-referenced events.
- Events that were temporally proximal to referenced events also had higher hit rates than those who were not.
- When accounting for the references, hit rates did not differ between retrodiction and prediction.

Schematic summary

