Temporal asymmetries in inferring unobserved past and future events

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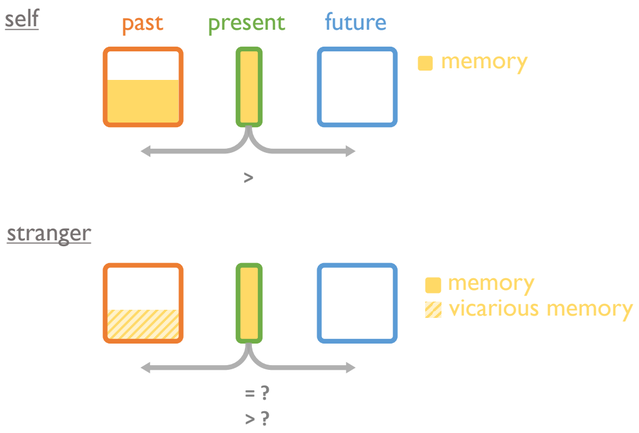
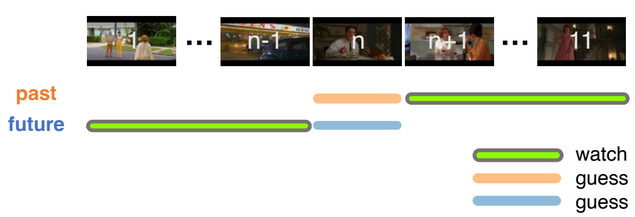
Background



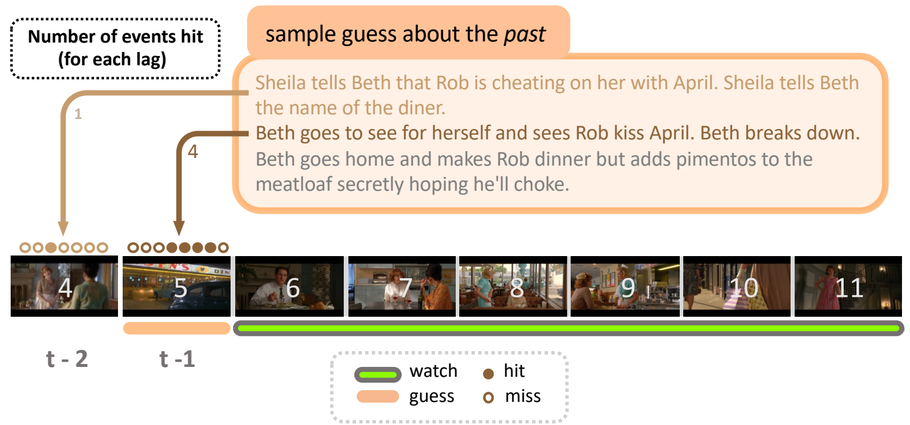
- We only have direct access to the present moment.
- Given the present, we typically know more about our own past than our future, since we remember our past experiences.
- For real-life events we don't have memories of, are we better at guessing about the unobserved past or the unobserved future, like in a stranger's life?
- Other people have memories of their own past lives, and these memories could be transmitted through e.g., conversations, thus become vicarious memories of the observers.
- These vicarious memories might provide additional information about unobserved past and future events.

Paradigm

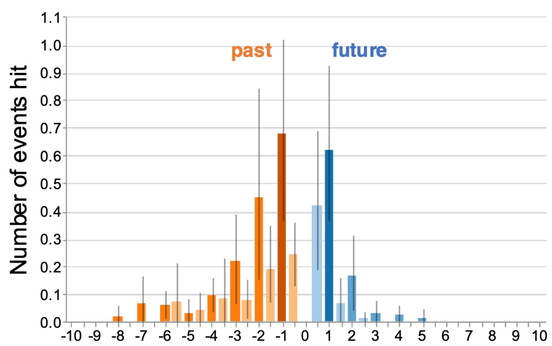


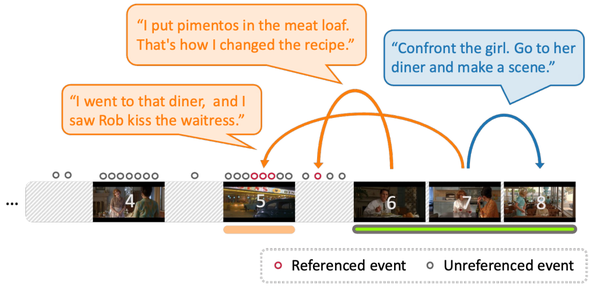
- Participants watched segments of a character-driven television drama and wrote out what would happen just before or after each just-watched segment.

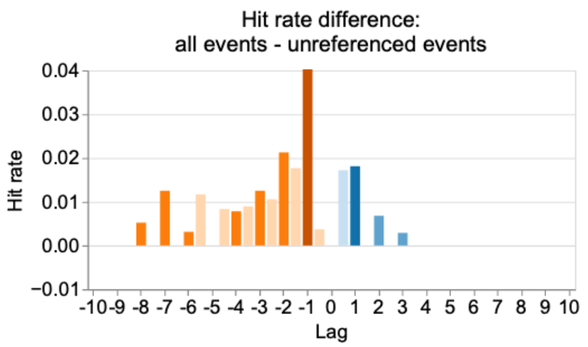
Analysis



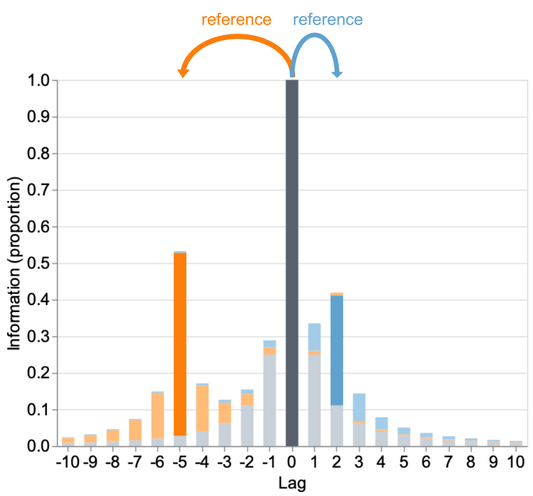
Results

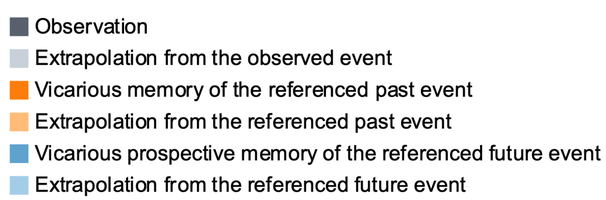




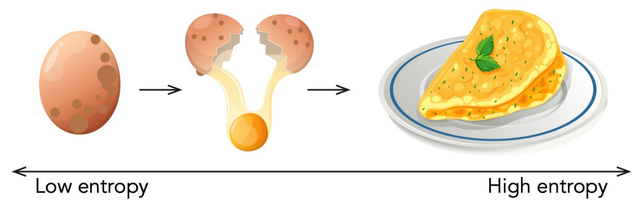


Schematic summary





Why do we know more about the past?



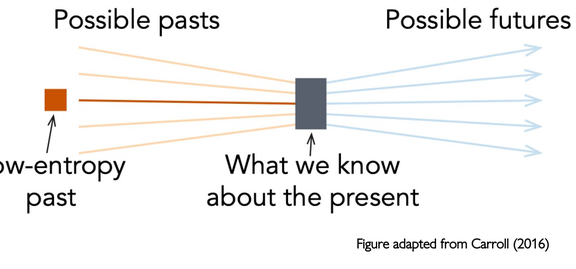


Figure adapted from Carroll (2016)

Future directions

- Simulate event sequences through the lens of the second law of thermodynamics
- Probe the potential relation between the thermodynamic arrow of time and the psychological arrow of time. Do we remember the time direction where entropy is lower (e.g., Mlodinow & Brun, 2014)?

Bibliography

1. Carroll, S. (2016). The big picture: on the origins of life, meaning, and the universe itself. *Dutton*.
2. Mlodinow, Brun (2014) Relation between the psychological and thermodynamic arrows of time. *Physical Review E*.
3. Xu, Zhu, Manning (2023) The psychological arrow of time drives temporal asymmetries in retrodicting versus predicting narrative events. *PsyArXiv*.