

Engaging narratives evoke similar brainwaves and lead to similar perception of time

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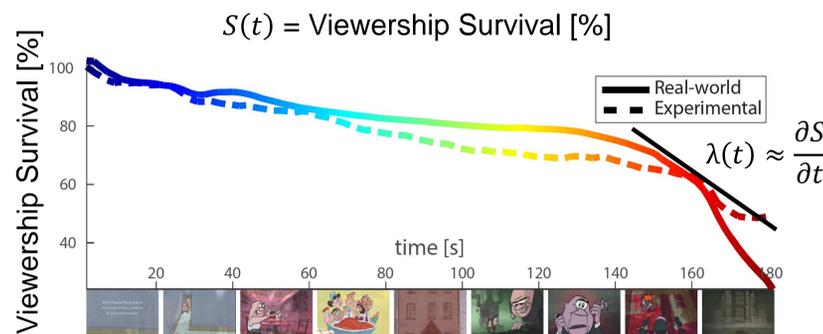
Introduction

- It is said that we lose track of time - that “time flies” - when we are engrossed in a story.
- How does engagement with the story cause this distorted perception of time, and what are its neural correlates?

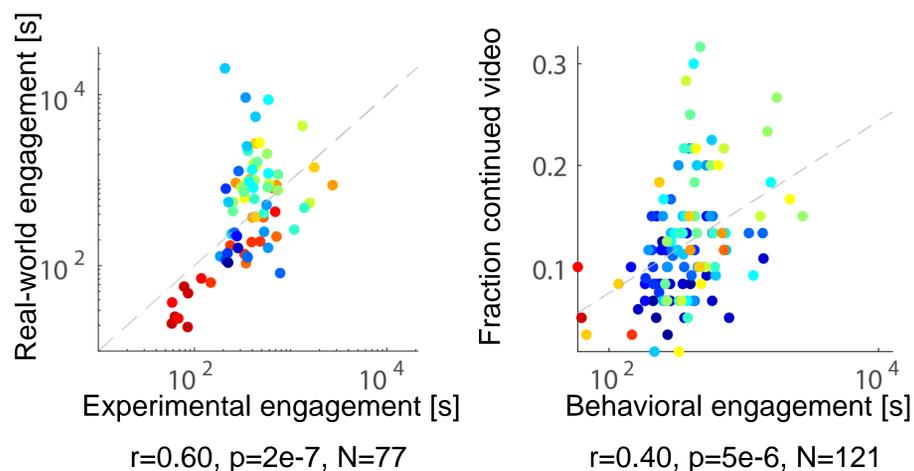
Experimental measure of engagement behavior



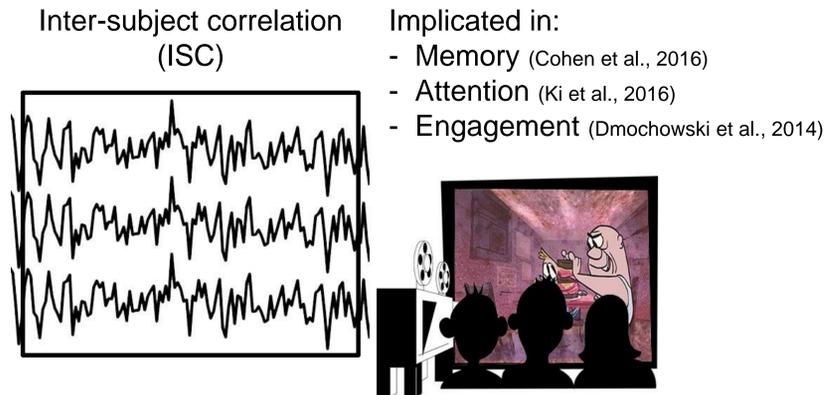
Engagement as committed or “surviving” viewers



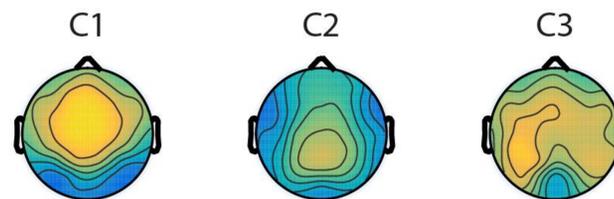
Behavioral engagement in “experimental” cohort mimics “real-world” behavior.



Inter-subject correlation in EEG as a measure of “neural engagement”



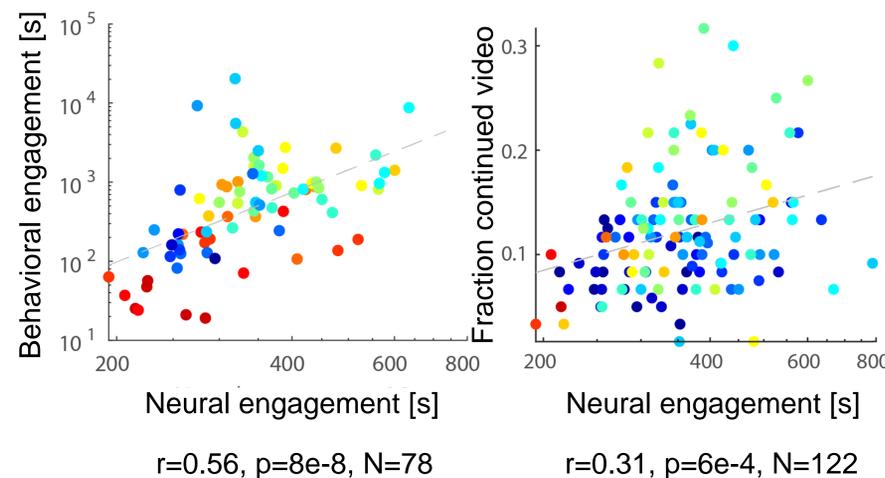
Spatial distribution of the three EEG components with maximal inter-subject correlation



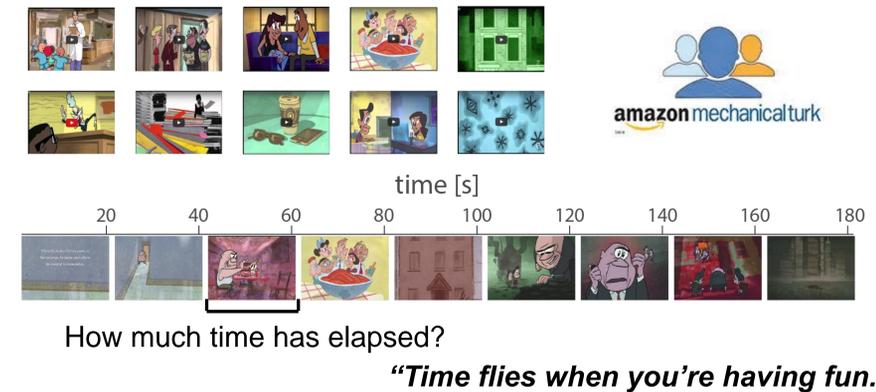
Neural engagement predicts behavioral engagement

“Neural Engagement” \approx (Baseline Engagement) \times (“ISC”)

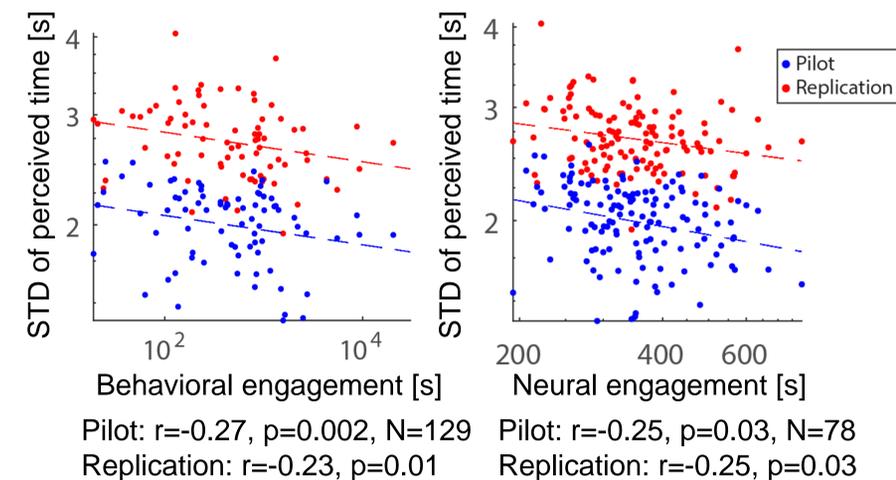
Train parameters on experimental behavioral engagement...
Test parameters on real-world behavioral engagement



Does engagement alter time perception?



Correlated brains perceive time more uniformly



Conclusions

- Engagement can be objectively quantified in terms of time commitment.
- The inter-subject correlation of evoked brain responses predicts behavioral engagement.
- Similar neural processing correlates with similar time perception.

References

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 Ki, J., Kelly, S., & Parra, L. C. (2016). Attention strongly modulates reliability of neural responses to naturalistic narrative stimuli. *Journal of Neuroscience*.
 Petroni, A., Cohen, S., Langer, N., Henin, S., Vanderwal, T., Milham, M. P., Parra, L. C. (2016). Age and sex affect intersubject correlation of EEG throughout development. *bioRxiv*.

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