Image Memorability Predicts Widespread Virality on Social Media

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Preprint Available!

Intro

- Prior research showed that **emotional contents and moral information in social media posts promotes virality** due to their ability in capturing attention and eliciting physiological arousal
  - However, emotional and moral perception stem from subjective appraisal, thus may **vary across different people**
- Memorability—an intrinsic, memory-related property of an image distinct from emotion—has been shown to predict an artwork's fame.

We thus hypothesize that

memorability may predict what goes viral on social media

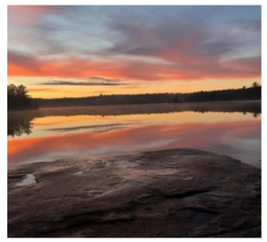
Methods

- Data was fetched from a well-known social media platform *Reddit*. N = 1,246

MEMORABLE

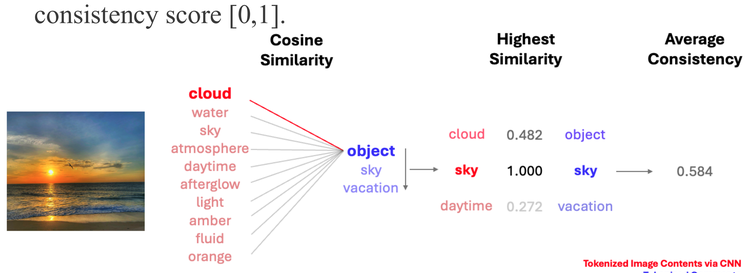
"It looks like a very angry **watermelon**"
"Oh no, this **watermelon** was touched by D I E G O B R A N D O"
"Damn this is amazingly cool. Super **talent** here"
"**Water dragon!**"
"This is amazing! but it gives me that **t-word phobia** feeling under my **skin**. I can't remember the **word** and I am certainly not googling it."

FORGETTABLE



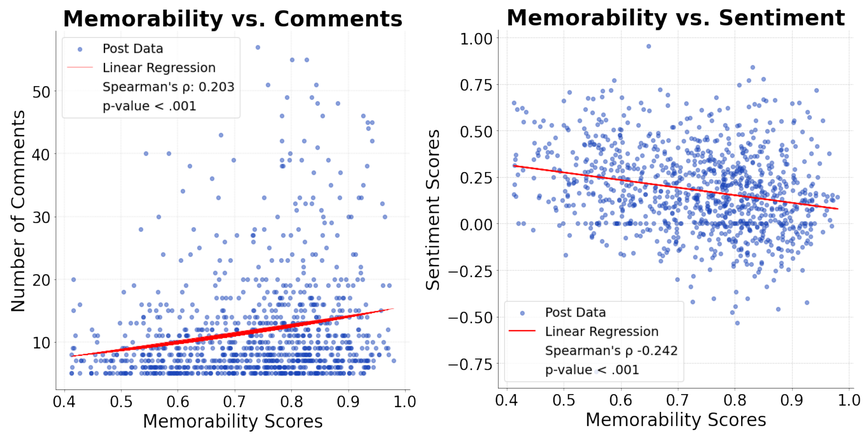
"**Mosquitos?**"
"**Trout**"
"I prefer 'public **land**',great pic"

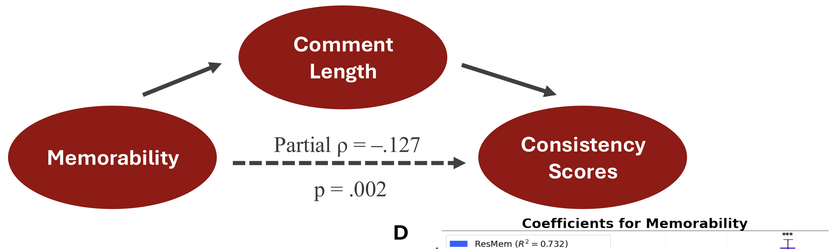
- **Consistency Analysis**
  - Object recognition network and NLP were used to get image labels and comment tokens
  - Cosine similarity between image labels and comment nouns were used to identified best-matching pairs, averaged to compute a consistency score [0,1].

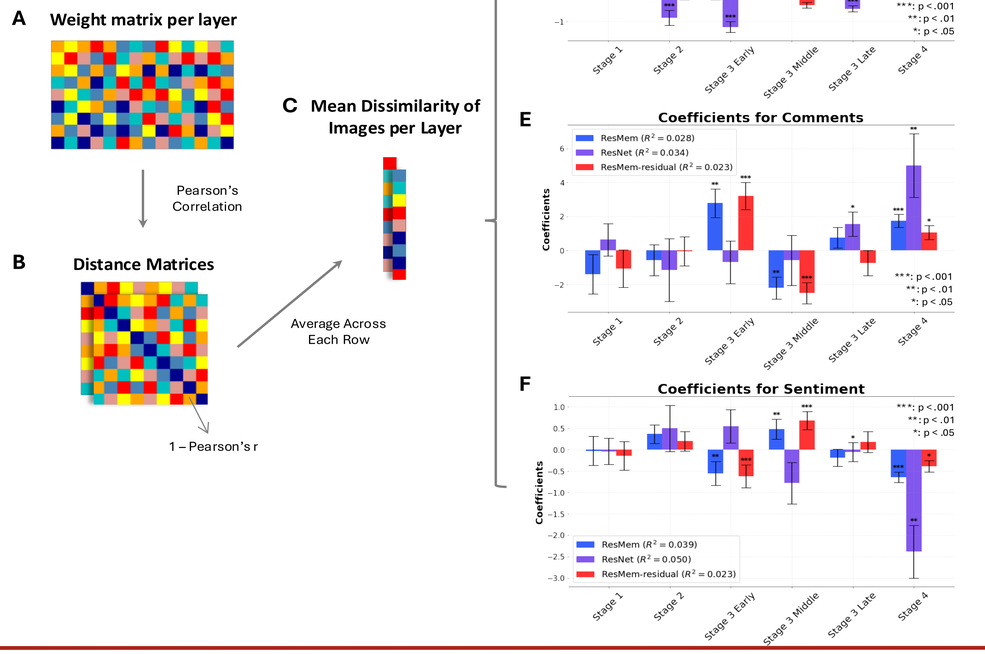


- **Neural Network Layer Analysis**
  - Images were processed by ResMem's ResNet layers, and memorability-specific features were isolated via regression against a pretrained ResNet distance matrix to yield the ResMem residual.

Results



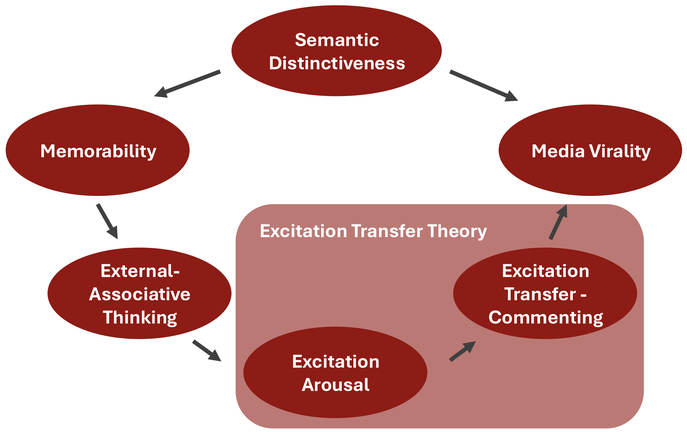




- **Memorable images get more comments, but not necessarily more upvotes.**
  - (3/3 timepoints for comments, 1/3 for upvotes)
- **Neutral sentiment in comments is linked to image memorability.**
  - (|Sentiment| r = –.189, p < .001)
  - A distinct, non-emotional pathway to virality
- **Comments on memorable images tend to reference external associations, not just the image content.**
  - (ρ = –.127, p = .002, controlling for comment length)
- **Semantic distinctiveness – key to memorability and engagement metrics prediction**

Discussion

- **Why memorability leads to social media virality?**
  - Potential Explanation: Excitation transfer theory



- **Ongoing Debate: Prototypicality or Distinctiveness makes an image memorable?**
  - Both. Semantic distinctiveness predicts cross-category memorability, while semantic prototypicality predicts within-category memorability

Reference

References will be provided upon request. Preprint available at: https://doi.org/10.48550/arXiv.2409.14659

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