

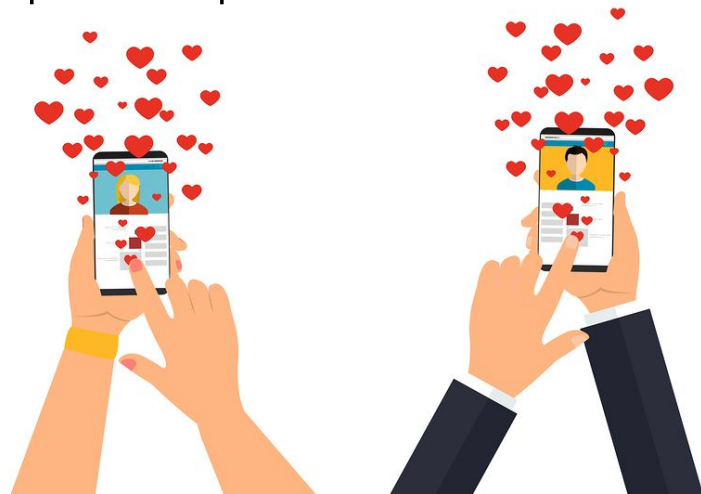
LoveSims:

Exploring 'What-If' Scenarios for Relationship Insights and Compatibility

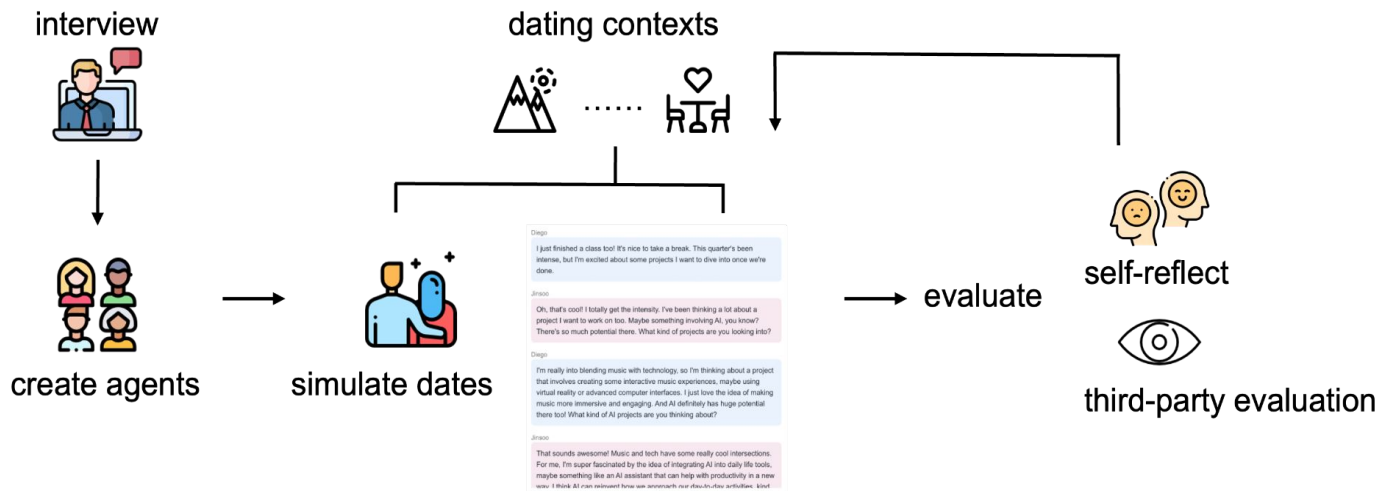
Existing dating technologies depend on repetitive trial-and-error processes.

Problem: Neglect long-term relational development concerns.

Our Goal: Provide information that goes beyond superficial matchmaking and benefit meaningful relationship development.



Generative Agent Behavioral Simulations could provide insights.



LoveSim framework **models the evolution of romantic relationships** through agent-based simulations.

2 different approaches for agent creation



Synthetic Agents



Real-Person Agents

context and types of simulation

- Two interaction types:
 - **One-to-One**: Single agent interacts with another agent.
 - **One-to-All**: Single agent interacts sequentially with all agents.
- Contextual scenarios (e.g., café dates, museum visits) guide interactions and allow customized "what-if" explorations.
- GPT-4 generates realistic agent responses via advanced prompt engineering.

Methodology – Evaluation Methods

- **Self-Reflection:** Agents critically reflect post-interaction, assessing compatibility and feelings.
- **Third-Party Evaluation:** Independent AI model evaluates interactions based on objective metrics (flow, connection, interests).

Run Evaluation

Choose how to evaluate the simulation results

☒ **Self Reflection**
Agent reflects on the interaction using post-simulation questions

☐ **Third-Party (Transcript)**
Analyze compatibility based on conversation transcript

☐ **Third-Party (Profiles)**
Analyze compatibility based on agent profiles and memories

☐ **Run All Evaluations**
Perform all applicable evaluation types

Run Evaluation

Decision:

Would Diego see them again? yes

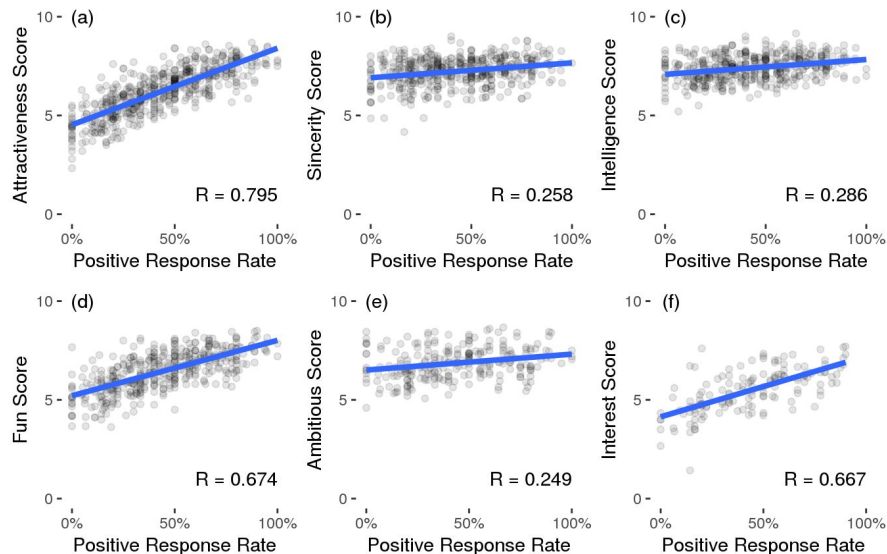
Satisfaction Score: 65/100

Length Feedback: Just right

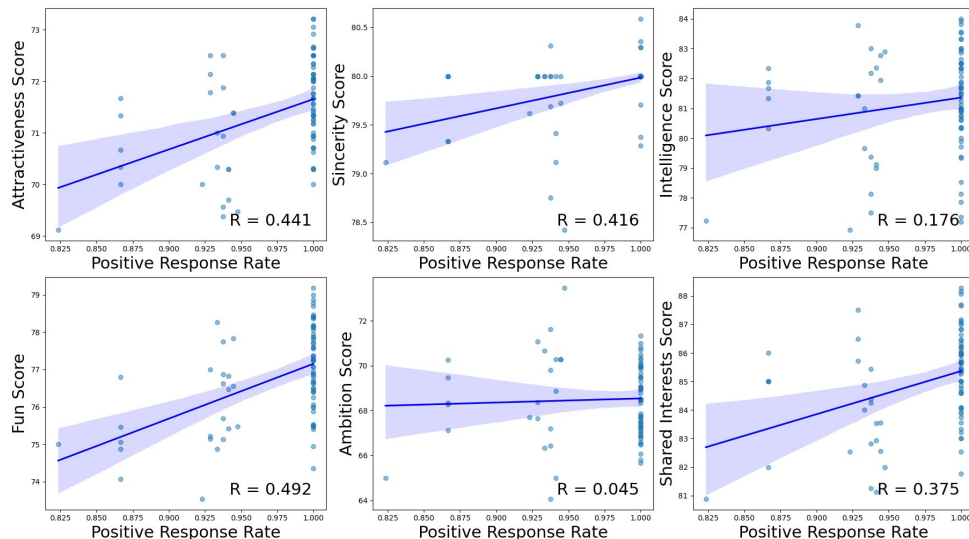
Attribute Ratings:

- Ambition: 68/100
- Attractiveness: 70/100
- Fun: 60/100
- Intelligence: 65/100
- SharedInterests: 72/100
- Sincerity: 75/100

Agent preferences mirrored real-world speed-dating data.

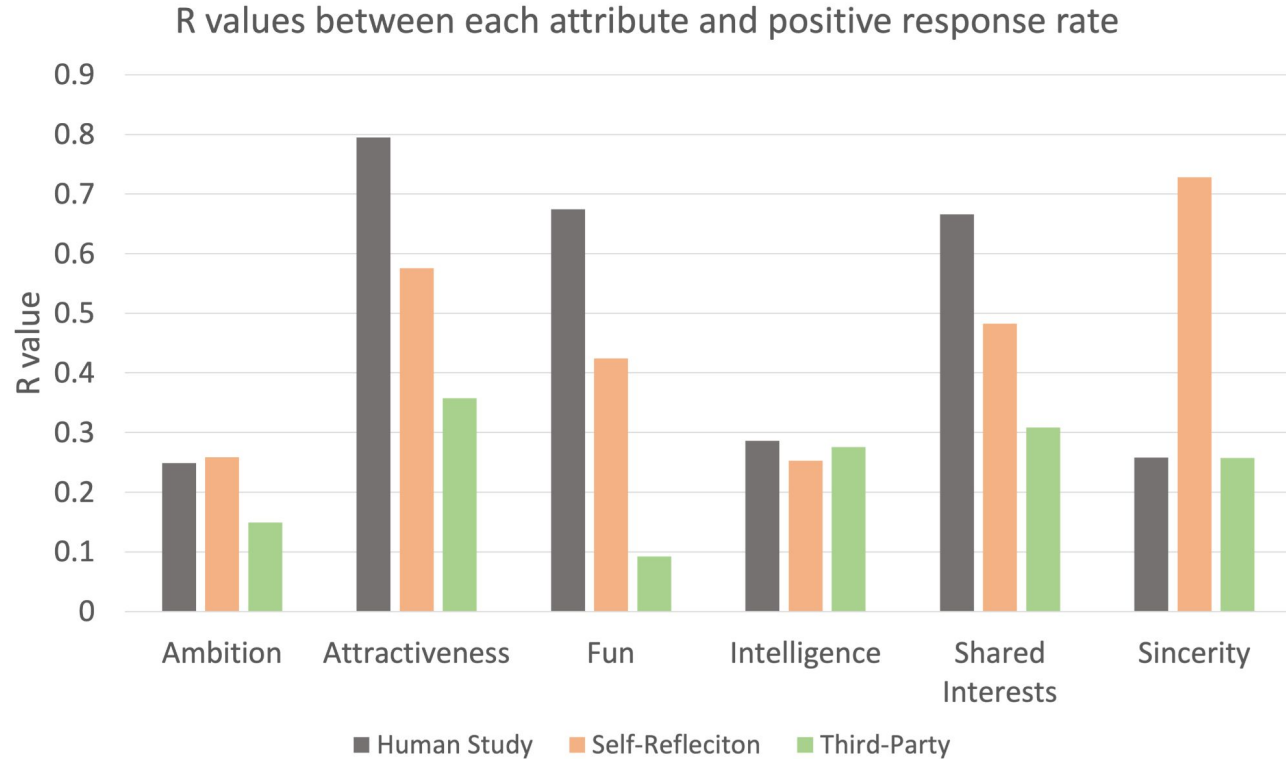


Human Experiment
(Hwang & Lucas Cadalz, 2016)



Agent Simulations

Self-reflection > third-party evaluations



Consistency & Context

- Agents showed high consistency in their dating responses:
 - Self-reflection condition: 89% consistency.
 - Third-party evaluations: 76% consistency.
- Context significantly affected interactions (e.g., Café vs. Museum), showing potentials to simulate the 'alternatives settings'

Future

- Human experiments and incorporate user feedback.
- Opens opportunities for better-informed relationship decisions, relationship counseling, and deeper human-AI interactions.

Ethical Considerations

- Generative agents currently lean toward positivity and politeness, risking unrealistic optimism.
- Challenges exist in capturing non-verbal cues, emotional fluctuations, and implicit behaviors.
- Future iterations must ethically balance realism and sensitivity, avoiding reinforcement of stereotypes or biases.

Research Question



Our ability to **replicate**:

How accurately can AI simulations **replicate romantic relationships**, and what factors contribute to creating a **personalized ideal partner**?



Our ability to **learn**:

What **patterns** can we identify about the **formation of romantic relationships** from these simulations?

Additional Questions



The role of personality traits and preferences in the dynamics of the sim



vs.



Role-playing vs. non-role-playing gpt



Influence of a date's context

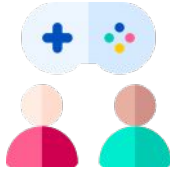
Prior research on speed dating



Attractiveness



Fun



Shared Interests



Intelligence



Ambition



Sincerity

GENDER DIFFERENCES IN MATE SELECTION: EVIDENCE FROM A SPEED DATING EXPERIMENT*

RAYMOND FISMAN
SHEENA S. IYENGAR
EMIR KAMENICA
ITAMAR SIMONSON

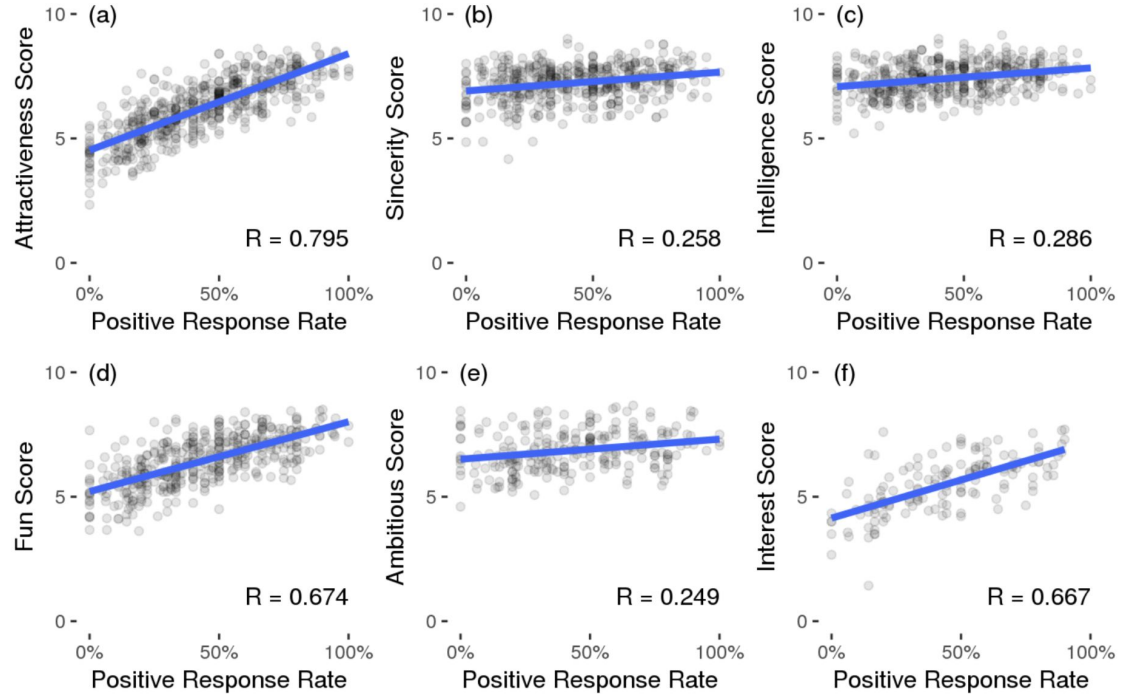
We study dating behavior using data from a Speed Dating experiment where we generate random matching of subjects and create random variation in the number of potential partners. Our design allows us to directly observe individual decisions rather than just final matches. Women put greater weight on the intelligence and the race of partner, while men respond more to physical attractiveness. Moreover, men do not value women's intelligence or ambition when it exceeds their own. Also, we find that women exhibit a preference for men who grew up in affluent neighborhoods. Finally, male selectivity is invariant to group size, while female selectivity is strongly increasing in group size.

(Fisman et al., 2006; Luo & Zhang, 2009; Tidwell et al., 2013)

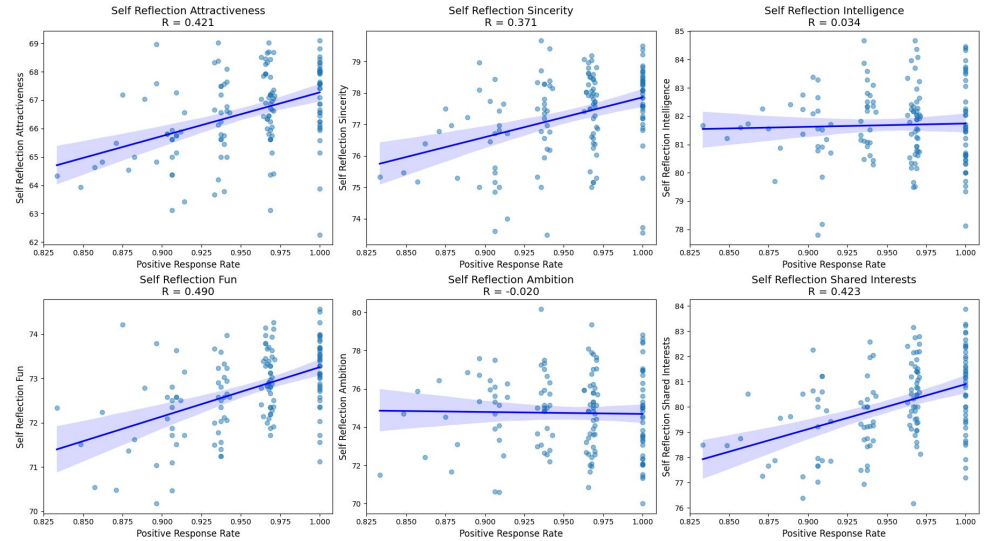
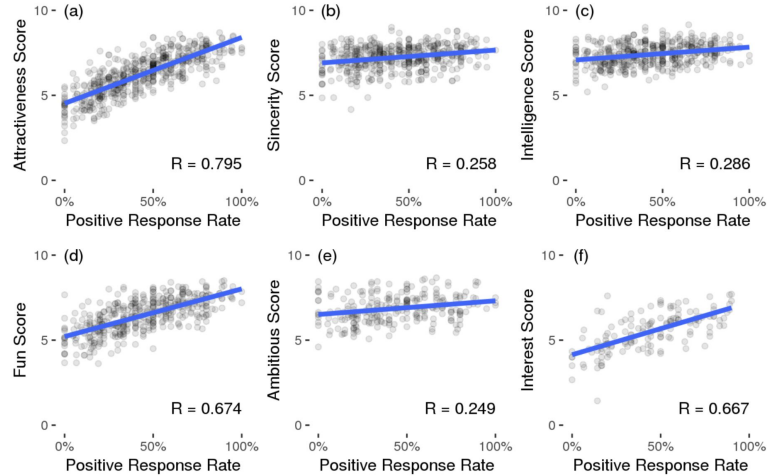
Analysis

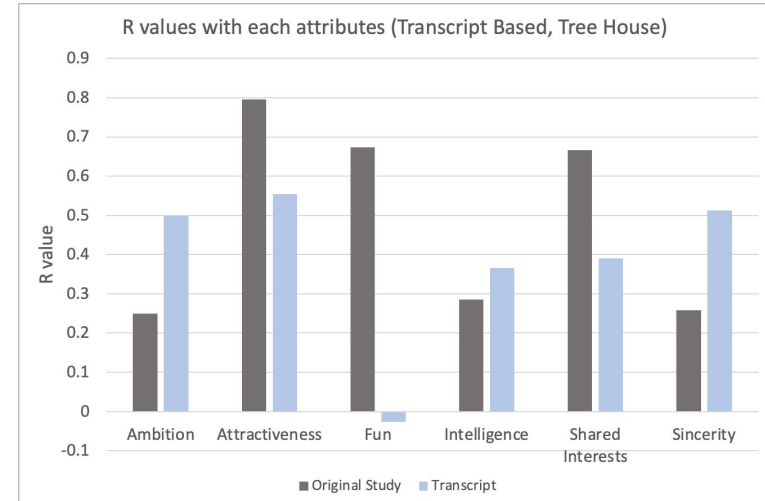
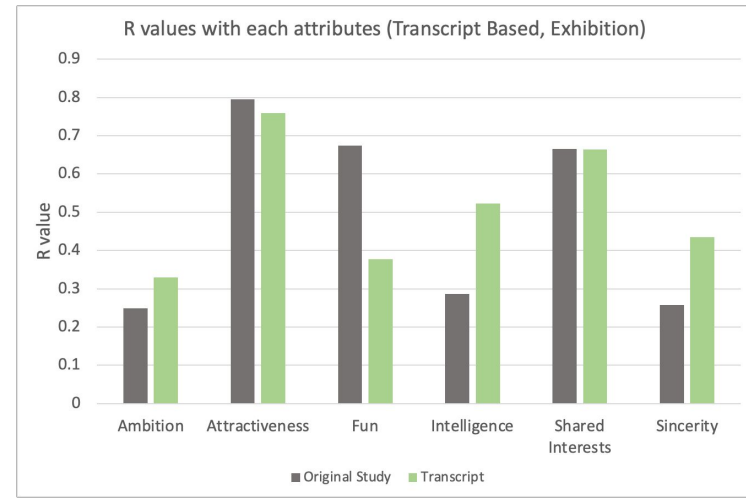
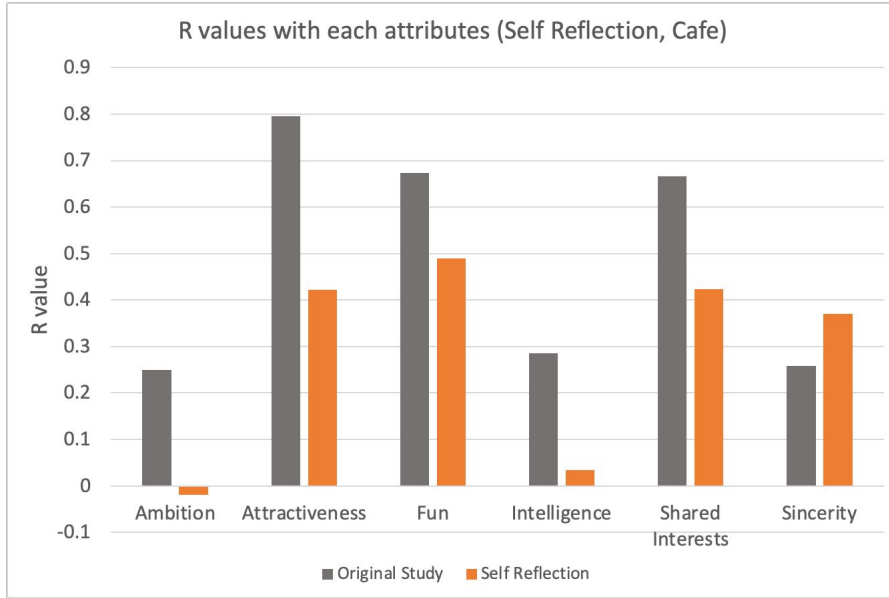
Positive response rate: how many positive responses an agent get.
For example, if a agent met with 10 agents and 6 of them indicated that they would like to meet again, the positive response rate would be 60%.

Y-axis: averaged scores the agent received from the 10 other agents.



Self Reflection





Results – Consistency Score

Setting	Self Reflection	Transcript Based
Tree House	99.68%	90.91%
Local Cafe	96.90%	89.76%
Exhibition	99.98%	75.23%

Individual Agent Accuracy

Qualitative Analyses

✓ - Individual Agent Interview matches base data

Good retrieval of relevant information.

Distinguish the public appearance & private self.

✓ - Positive reviews from human: “It’s saying things that I would say if I were in a date!”

✗ - Hallucinations: Claiming to have done things that the transcripts never mentioned

Group Accuracy

✗ - Response given by Agents **lack variability** and show **too much of agreeability**

MainAgent	TargetAgent	Reflection Satisfaction Score	Reflection Length Feedback	Self Reflection Decision
Diego	Arjun	75	Just right	yes
Diego	Camila	75	Just right	yes
Diego	Elena	78	Just right	yes
Diego	Eleni	78	Just right	yes
Diego	Ethan	75	Just right	yes
Diego	Jinara	78	Just right	yes
Diego	Jinaya	78	Just right	yes
Diego	Jinhee	78	Just right	yes
Diego	Jinsoo	78	Just right	yes
Diego	Jinwoo	78	Just right	yes
Diego	Julian	78	Just right	yes
Diego	Kai	78	Just right	yes
Diego	Kiran	78	Just right	yes
Diego	Leila	78	Just right	yes

✓ - Show Similar Patterns of correlation coefficients with the human study

Summary

- Output can **vary drastically** given different dating context
 - Self Reflection worked well in cafe
 - Transcript worked well in exhibition; Did not work well in treehouse
- Problems: Agents gives **similar response and are overly positive**
 - Tried different prompts, including “be brutally honest”, or few-shot prompts with examples => still too positive



Prompt Engineering & Testing on smaller datasets

Human Validations: does the agent decision match human's decision?

Higher Fidelity of the Agents => better results

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