

# Intent Prediction in Online Dating:

**Algorithmic Alignment & Causal Drivers of Family Planning**

 python  pandas  spaCy

  Shap

# Executive Summary

Optimizing Match Relevance by Decoupling Interest from Intent



## Demographics fail to capture the nuance of user intent.

Demographics provide **79% baseline** accuracy for family planning but miss the **child-free** vs. **not ready** distinction.



## Romance signals are not a proxy for family planning.

Users seeking “love” and “connection” showed **no meaningful increase** in family planning, highlighting an inverse of algorithmic assumptions.



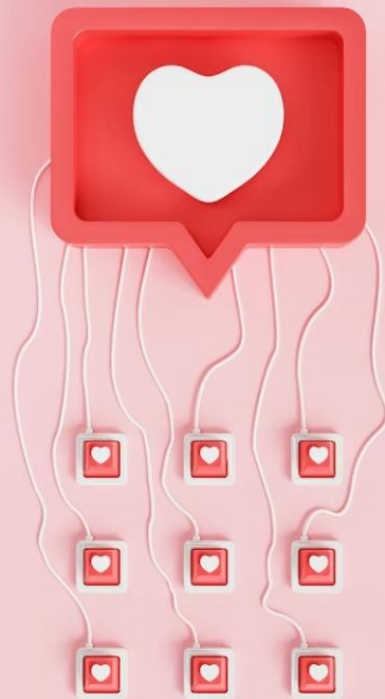
## Psychographic personas provide improved matching.

**Socialite** behaviors **increase** family planning by **+18.5%**, while **Techie** interests **decrease** family planning by **-19.8%**.



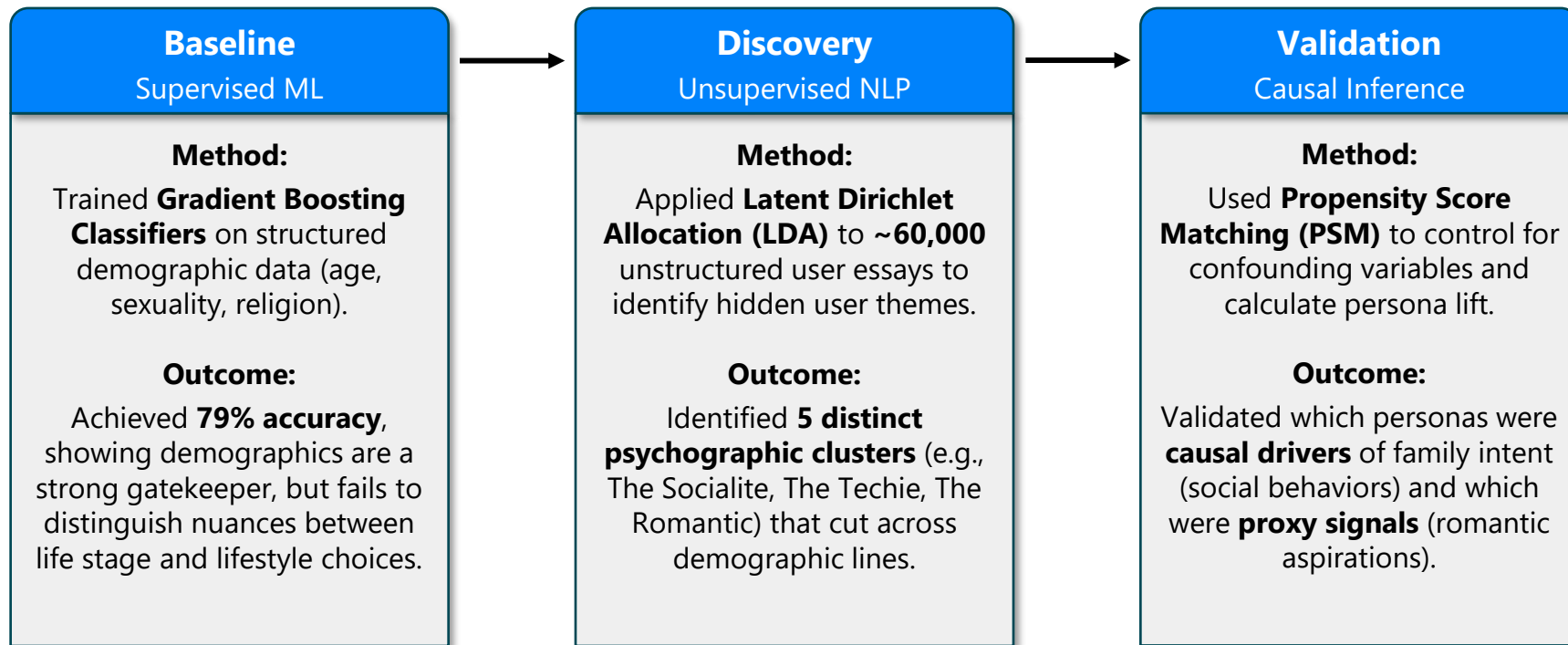
## Algorithmic alignment requires distinct tracks.

Decouple **interest-based** matching from **intent-based** matching to reduce false positives and avoid nudging users toward incompatible partners.



# From Data to Insight: The Research Pipeline

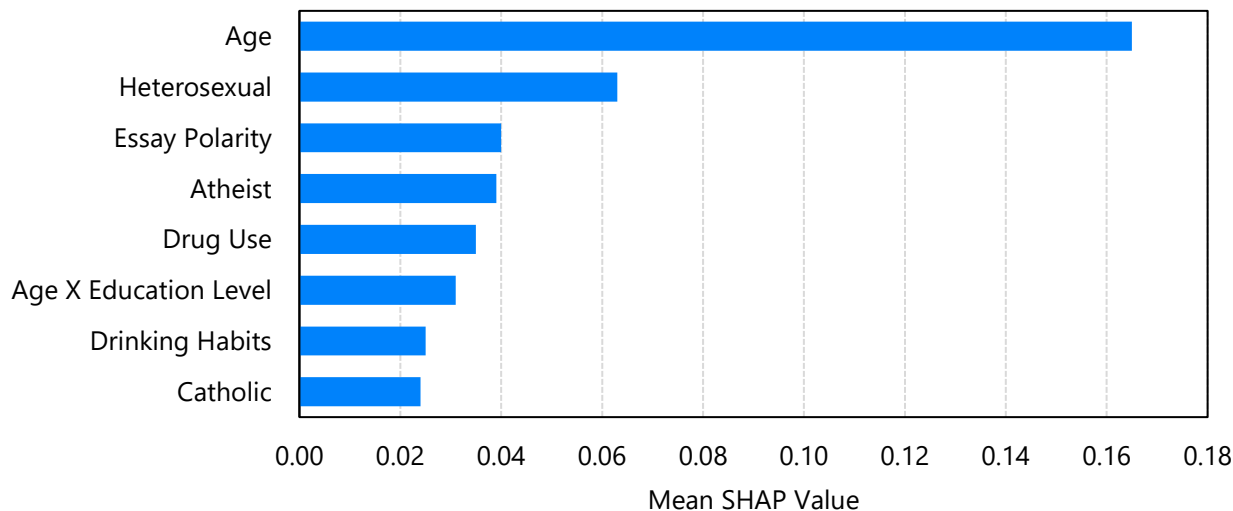
Triangulating User Intent via Machine Learning, Natural Language Processing, and Causal Inference



# Demographics Miss Lifestyle Choice Nuance

Baseline Gradient Boosting Model: SHAP Feature Importance Analysis

Global Feature Importance



## Demographic Predictors

(> .02 SHAP Value)

### Life Stage:

Age & Age X Education Level

### Identity:

Sexual Orientation & Religion

### Emotional Disposition:

Essay Polarity

### Habits:

Drug Use & Drinking Habits

The model focuses too heavily on **Life Stage** and misses **Lifestyle Choices**

A 35-year-old **child-free** user is **identical** to a 35-year-old **family-seeker**, leading to high-friction matches.

# Unlocking Psychographics: Language is a Behavior

Latent Dirichlet Allocation (LDA) Topic Modeling of User Essays



## The Artist

*Keywords:*  
Art, Film, Band

*Signal:* Non-traditional lifestyle; values expression, creativity, and aesthetics



## The Techie

*Keywords:*  
Game, Video, Computer

*Signal:* Niche interests; highly specific media and tech culture compatibility



## The Socialite

*Keywords:*  
TV, Sports, Dinner

*Signal:* High social activity; values community and shared experiences



## The Professional

*Keywords:*  
Work, Home, Business

*Signal:* High ambition; prioritizes stability and career trajectory



## The Romantic

*Keywords:*  
Relationship, Soul, Heart

*Signal:* Intimacy-focused; explicitly seeking deep emotional connection

# Lifestyle Choices Drive Family Planning

Validating Causal Drivers via Propensity Score Matching (PSM)

## Propensity Score Matching

### Challenge:

Are certain personas (e.g., Socialites) more family-oriented, or just older?

### Method:

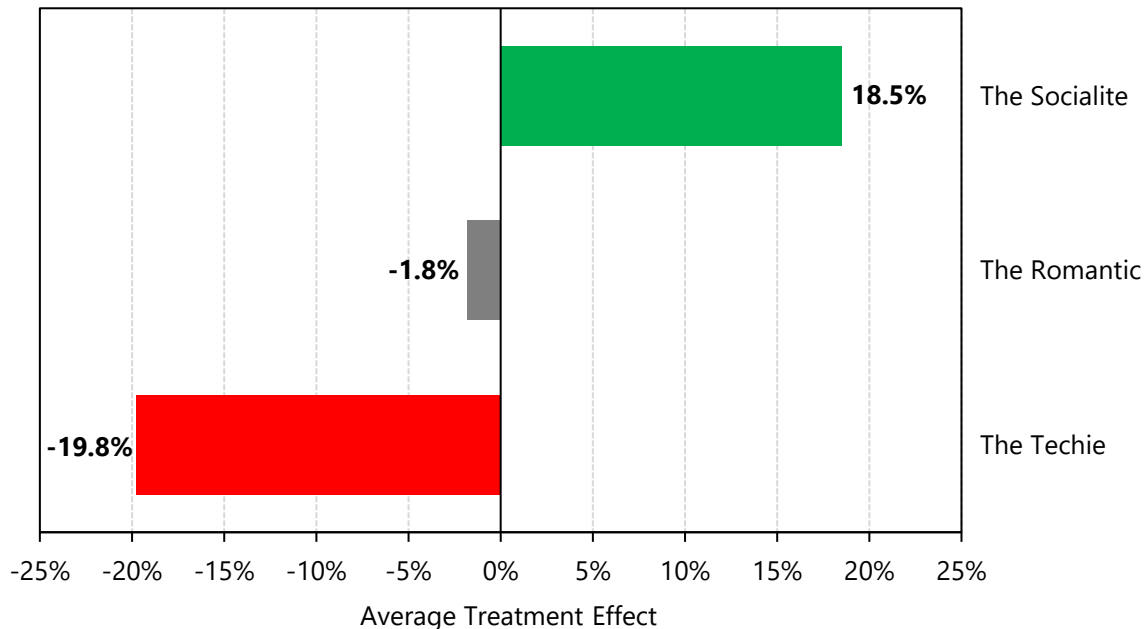
Create statistical “twins” for every user (a demographically identical “non-persona”) to isolate causal effects.

### Insight:

Lifestyle choice is a significant causal driver.

- **Socialites:** Community focus aligns with family goals.
- **Techies:** Niche interests compete with family planning.
- **Romantics:** “Love” signals are noise, proving intent is distinct from connection.

## Causal Lift on Family Planning



# From Insight to Impact: Strategic Recommendations

Optimizing Product Features Based on Psychographic Drivers



## The Algorithm

Decouple Interest from Intent

### Insight:

Niche interests **actively suppress** family intent signals.

### Recommendation:

Downweight **interest-based** matching. Prioritize **latent psychographics** as a primary feature.



## The Onboarding

"Lifestyle" Signal Onboarding

### Insight:

Demographics achieve **79% accuracy** but miss nuance.

### Recommendation:

Replace static demographic filters with a **visual lifestyle quiz**. Let users self-select into specific psychographic tracks (e.g., Socialite, Romantic).



## The Growth

Segmented Value Proposition

### Insight:

"Romantics" seek **connection**, not commitment.

### Recommendation:

Stop retargeting "Romantic" users with ads about family. Shift focus to **"deep connection" messaging** to align with actual intent.