



Are Yang and McSteamy More Receptive to a Hot Vote than Meredith and George? Heterogeneity in Treatment Effects in Online Dating

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Online Dating Is Big!



- ❑ “... More than one third of those married between 2005 and 2012 met on-line.” (Cacioppo et al., 2013)
- ❑ “Usage [of online dating] by 18- to 24-year-olds has increased nearly threefold since 2013, while usage by 55- to 64-year-olds has doubled” (PewResearch, 2016)

Popular Online Dating Sites



Online Dating Site Features Influence User Behavior

- ❑ **Anonymous Viewing:** Bapna et al. (2016) studied anonymous profile viewing, and found that it negatively impacted online dating matches, particularly for females!
- ❑ This feature was known to hinder the **weak-signaling** strategy.

Study of Anonymous Viewing in Bapna et al. (2016)



- ❑ In this paper we study a **strong-signaling** strategy that is activated by our **vote-identity revelation** feature!

Main Research Question



- ❑ **Our research studies the impact of vote-identity revelation feature on users' online dating engagement and matching outcomes.**

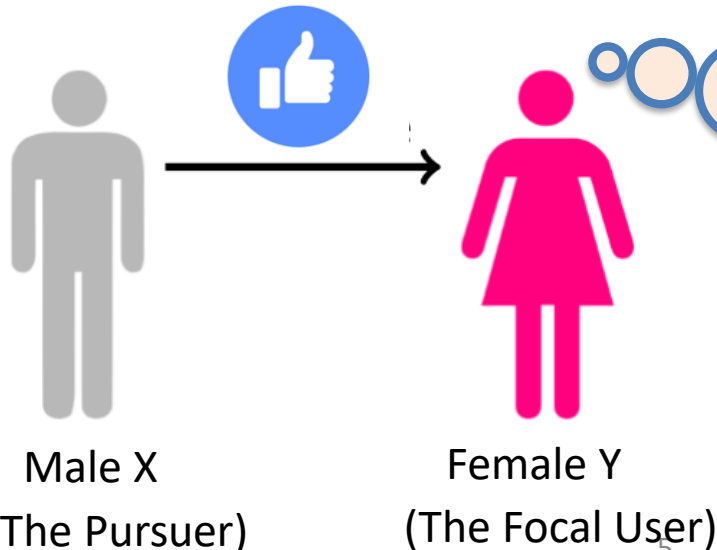
Question 1: How does the vote-identity revelation feature impacts users' online dating engagement and matching outcomes?

Question 2: Is there any differential impact of this feature based on attractiveness levels of the focal users and those who pursue them with a like vote?

The Vote-Identity Revelation Feature



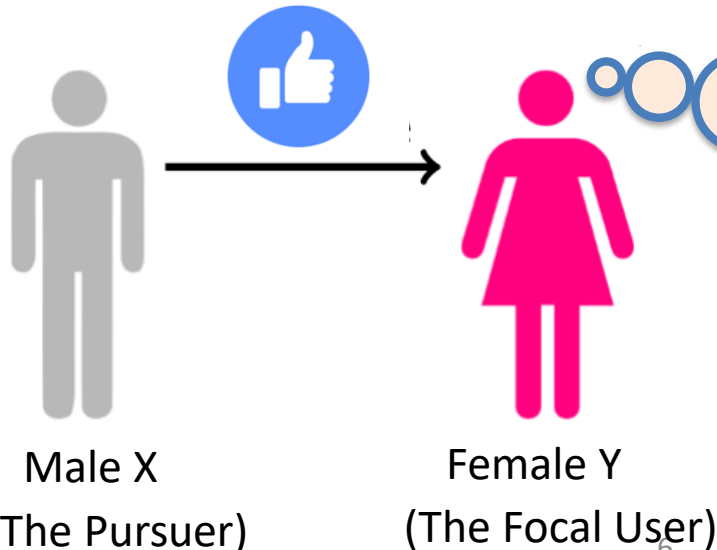
- ❑ **Definition:** It is the feature that allows treated users to see the identity of other users who voted them with a like.
- ❑ **In the Control Group:** Users only see the count of who likes them.



The Vote-Identity Revelation Feature







- ❑ **Definition:** It is the feature that allows treated users to see the identity of other users who rated them with a like.
- ❑ **In the Treatment Group:** Users can see the identity of who likes them.



How Can the Vote-Identity Revelation Feature's Impact Span Out?



❑ **Answer:** It's not clear.

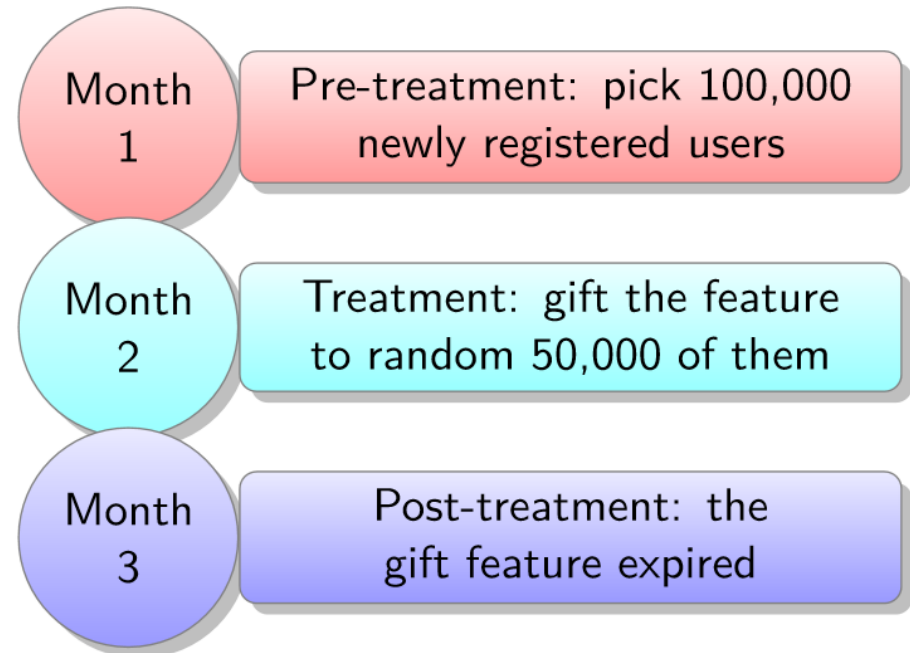
		Pursuer's Attractiveness	
		High	Low
Focal User Attractiveness	High	 or 	 (Thibaut & Kelley, 1959)
	Low	 (Eagly et al. 1991)	—

The Experiment



- ❑ We ran a large-scale randomized field experiment with a big North American online dating site that we call **monCherie.com**.
- ❑ In this experiment, we follow 100,000 newly registered users, and gift a random sample of 50,000 users with the **vote-identity revelation** feature.

Experiment Design

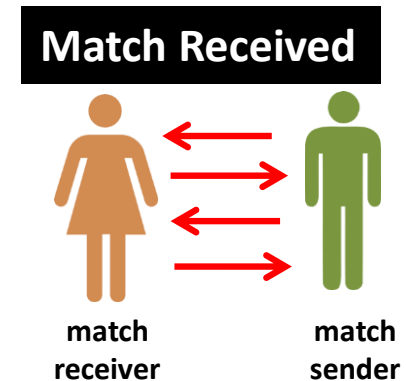
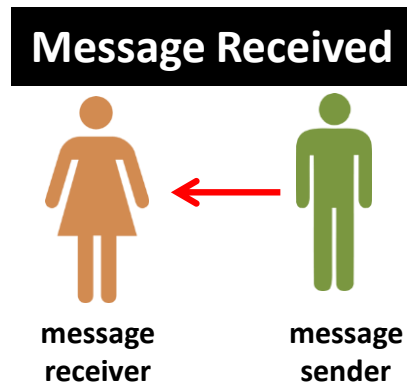
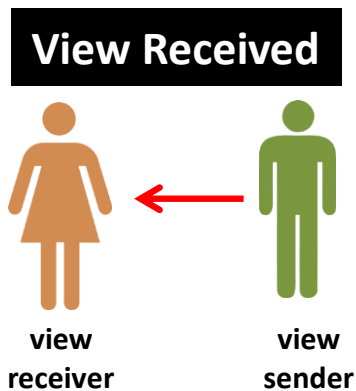
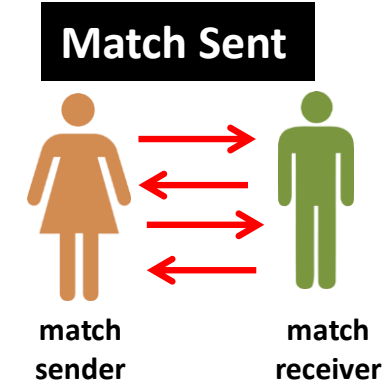
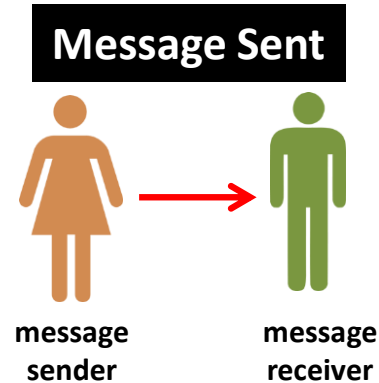
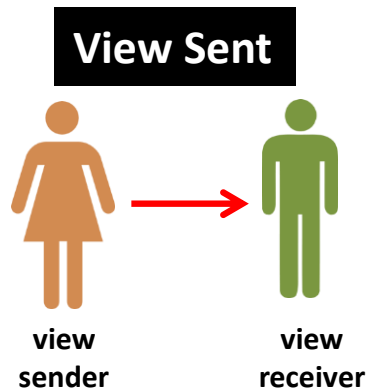


Online Dating Engagement and Matching Outcomes

viewing

messaging

matching



Empirical Model: Poisson Regression Model

- We use the exogenous **vote-identity revelation treatment** provided by the field **experiment setup**, and apply a Poisson **estimation model** of the form:

$$\begin{aligned} \text{Online Dating Activity}_i = & \rho_T \cdot \text{Treatment}_i + \alpha_I \cdot \text{Own Attract}_i + \beta_I \cdot \text{Ave Sender Attract}_i + \\ & \alpha_T \cdot \text{Treatment}_i \cdot \text{Own Attract}_i + \beta_T \cdot \text{Treatment}_i \cdot \text{Ave Sender Attract}_i + \\ & \gamma_T \cdot \text{Treatment}_i \cdot \text{Own Attract}_i \cdot \text{Ave Sender Attract}_i + \mu_I \cdot \mathbf{Controls}_i + e_i \end{aligned}$$

Where,

- i refer to users
- **Online Dating Activity _{i}** is the outcome variable for dating activities like viewing, messaging, and matching for user i .
- **Treatment _{i}** is the binary indicator of the vote-identity revelation.
- ρ_T is the coefficient of main treatment effect
- α_T is the coefficient of treatment effect interacted with focal users attractiveness
- β_T is the coefficient of treatment effect interacted with pursuer's attractiveness
- γ_T is the coefficient of the three-way interaction term among treatment, focal users attractiveness, and pursuer's attractiveness.

The Vote-Identity Revelation Treatment Shows Different Impacts Along the Attractiveness Dimensions

Heterogeneous Treatment Effects for Females

	View Sent	Msg Sent	Match Sent	View Rcvd	Msg Rcvd	Match Rcvd	Total Match
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Treatment	0.161*** (0.01)	0.143*** (0.03)	0.185** (0.09)	0.169*** (0.01)	0.202*** (0.02)	0.260*** (0.04)	0.242*** (0.04)
Own Attractiveness	0.063*** (0.01)	0.121*** (0.02)	-0.086 (0.08)	0.253*** (0.01)	0.308*** (0.01)	0.294*** (0.03)	0.231*** (0.03)
Average Senders Attractiveness	-0.094*** (0.01)	-0.026 (0.02)	0.006 (0.05)	-0.159*** (0.01)	-0.142*** (0.02)	-0.045 (0.03)	-0.035 (0.03)
Treatment * Own Attractiveness	0.008 (0.01)	-0.161*** (0.03)	-0.044 (0.10)	-0.024*** (0.01)	-0.039** (0.02)	-0.262*** (0.04)	-0.216*** (0.04)
Treatment * Average Senders Attractiveness	0.164*** (0.01)	0.345*** (0.03)	0.257*** (0.08)	0.262*** (0.01)	0.319*** (0.02)	0.359*** (0.04)	0.344*** (0.04)
Treatment * Own Attractiveness * Average Senders Attractiveness	-0.124*** (0.01)	-0.106*** (0.03)	-0.450*** (0.09)	-0.016* (0.01)	-0.005 (0.02)	0.026 (0.04)	-0.056 (0.04)
Controls	Y	Y	Y	Y	Y	Y	Y
Observations	1,766	1,766	1,766	1,766	1,766	1,766	1,766

□ Let's dig deep into these results ...

Main Treatment Effect is Positive Across All Online Dating Engagement and Matching Outcomes



Main Treatment Effects for Females

**Vote-Identity
Revelation Treatment**

View Sent	Message Sent	Match Sent	View Received	Message Received	Match Received	Total Match
0.161***	0.143***	0.185**	0.169***	0.202***	0.260***	0.242***
(0.01)	(0.03)	(0.09)	(0.01)	(0.02)	(0.04)	(0.04)

- ❑ **Conclusion:** We find that online dating engagement and matching outcome improved for female users, for both sent and received variables.

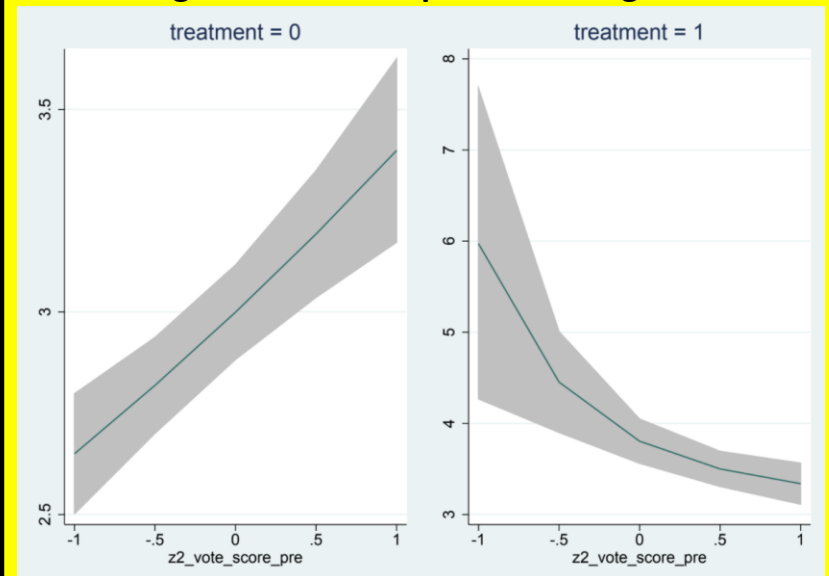
When Treatment Interacts with Focal Users Attractiveness Levels, We find an “Ego Effect”

Heterogeneity in Treatment Effects for Females

	View Sent	Message Sent	Match Sent	View Received	Message Received	Match Received	Total Match
Treatment * Focal Users Attractiveness	0.008 (0.01)	-0.161*** (0.03)	-0.044 (0.10)	-0.024*** (0.01)	-0.039** (0.02)	-0.262*** (0.04)	-0.216*** (0.04)

- ❑ **Conclusion:** We find that due to the treatment there is decrease in engagement and matching outcomes for highly attractive female users. For instance, females self initiated messaging decreases.

Marginal Effects Graph for Message Sent

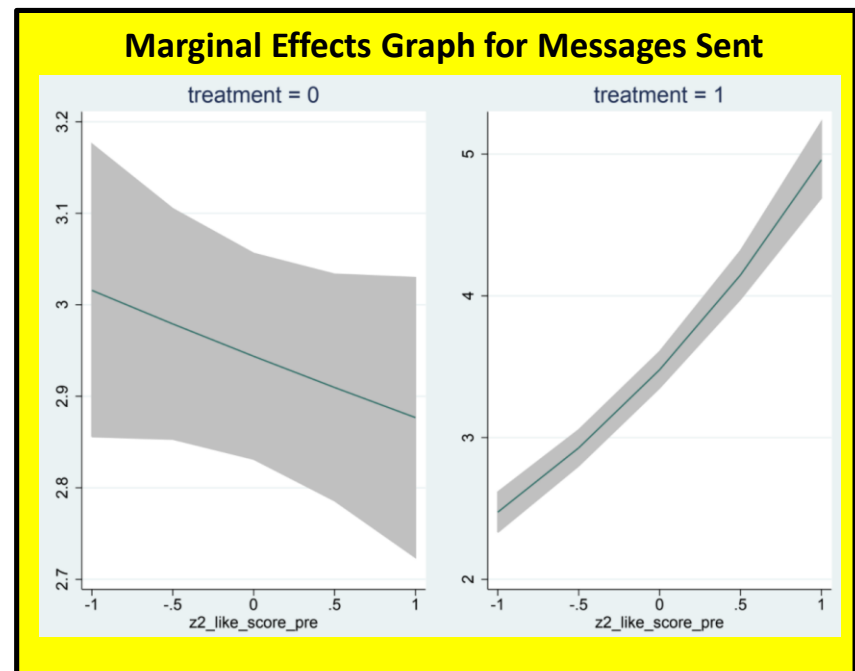


When Treatment Interacts with Pursuer's Attractiveness Levels, We find an “Encouragement Effect”

Heterogeneity in Treatment Effects for Females

	View Sent	Message Sent	Match Sent	View Received	Message Received	Match Received	Total Match
Treatment * Pursuer's Attractiveness	0.164*** (0.01)	0.345*** (0.03)	0.257*** (0.08)	0.262*** (0.01)	0.319*** (0.02)	0.359*** (0.04)	0.344*** (0.04)

- ❑ **Conclusion:** We find that due to treatment, there is increase in engagement and matching outcomes for female users when the user receives likes from attractive pursuers.



For the Three-Way Interaction Term, We Find that “Ego Effect” Dominates “Encouragement Effect”

Heterogeneity in Treatment Effects for Females

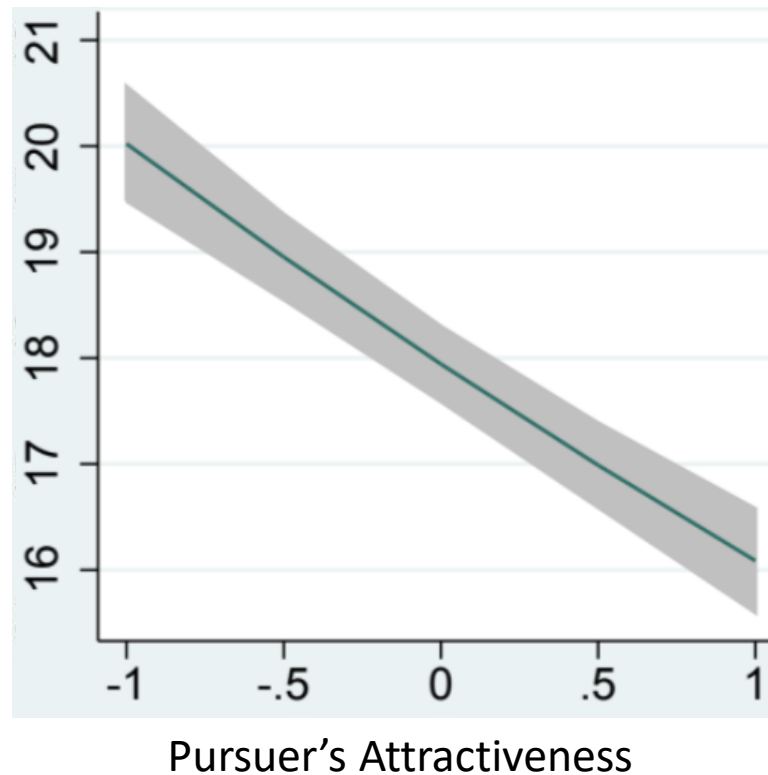
	View Sent	Message Sent	Match Sent	View Received	Message Received	Match Received	Total Match
Treatment * Focal Users Attractiveness * Pursuer's Attractiveness	-0.124*** (0.01)	-0.106*** (0.03)	-0.450*** (0.09)	-0.016* (0.01)	-0.005 (0.02)	0.026 (0.04)	-0.056 (0.04)

- ❑ **Conclusion:** When both “Ego effect” and “Encouragement Effect” are simultaneously present, we find that the ego effect dominates the encouragement effect as shown by the negative significance of the engagement and matching coefficients, particularly for activities that were initiated by female users.

For the Three-Way Interaction Term, We Find that “Ego Effect” Dominates “Encouragement Effect”

Marginal Effects Graph for Views Sent

Focal User Attractiveness = Very High



Research Implications



- ❑ We find that online dating website features, like the vote-identity revelation feature, can increase user engagement.
- ❑ Our analysis suggest that different cohorts reacts differently to the same feature.
- ❑ Our results can inform business stakeholders and website managers on how to go about launching new site features, given the impacts are different across different cohorts!



So, Are Yang and McSteamy More Receptive to a Hot Vote than Meredith and George?



❑ Answer: It depends!

Yang



McSteamy



Meredith



George



Thank You



References



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