So, Who Likes You?

Evidence from a Randomized Field Experiment

Online Appendix

Appendix A

Table A1 – Model Selection Using Akaike information criterion (AIC)

AIC Calculation Across Models	(1) *MatchesReceived*	(2) *MatchesSent*
(1) Female only NB Model for heterogeneity analysis by desirability		
No. of Observations	10218	10218
No. of parameters	45	45
Log Likelihood	-16378.5558	-6996.1094
AIC	32849.1117	14084.2187
(2) Male only NB Model for heterogeneity analysis by desirability		
No. of Observations	24115	24115
No. of parameters	45	45
Log Likelihood	-11252.3608	-24929.5167
AIC	22596.7215	49951.0335
(3) Combined AIC from (1) and (2)	55441.8332	64031.2522
(4) Pooled NB Model for heterogeneity analysis by desirability		
No. of Observations	34333	34333
No. of parameters	90	90
Log Likelihood	-27658.4791	-31947.6538
AIC	55498.9583	64077.3076

Note: Combined AIC in (3) = -2 * (log likelihood in (1) + log likelihood in (2)) + 2 (no. of parameter in (1) + no. of parameter in (2)).

Appendix B: SUTVA Corrected Models

Table B1: Neighbors' Exposure to Treatment in the *ViewsSentPre* Network

For Treated Focal Females (Sample size = 11,171) –

	Total No. of Neighbors	No. of Treated Neighbors	Percentage of Treated Neighbors = $\left(\frac{\text{No. of Treated Neighbors}}{\text{Total No. of Neighbors}} * 100\right)$
Mean	55.25	0.37	1.01
Std.	109.13	0.87	5.21
Median	21	0	0

For Treated Focal Males (Sample size = 28,549) –

	Total No. of Neighbors	No. of Treated Neighbors	Percentage of Treated Neighbors = $\left(\frac{\text{No. of Treated Neighbors}}{\text{Total No. of Neighbors}} * 100\right)$
Mean	89.69	0.50	0.55
Std	197.74	0.50	1.36
Median	26	1	0

Next, e use the more flexible regression adjustment following Chin (2019) to tackle the second order SUTVA violation scenario, where the treated and control group users are connected via a third person, with whom they each interact directly.

To calculate the correction term we:

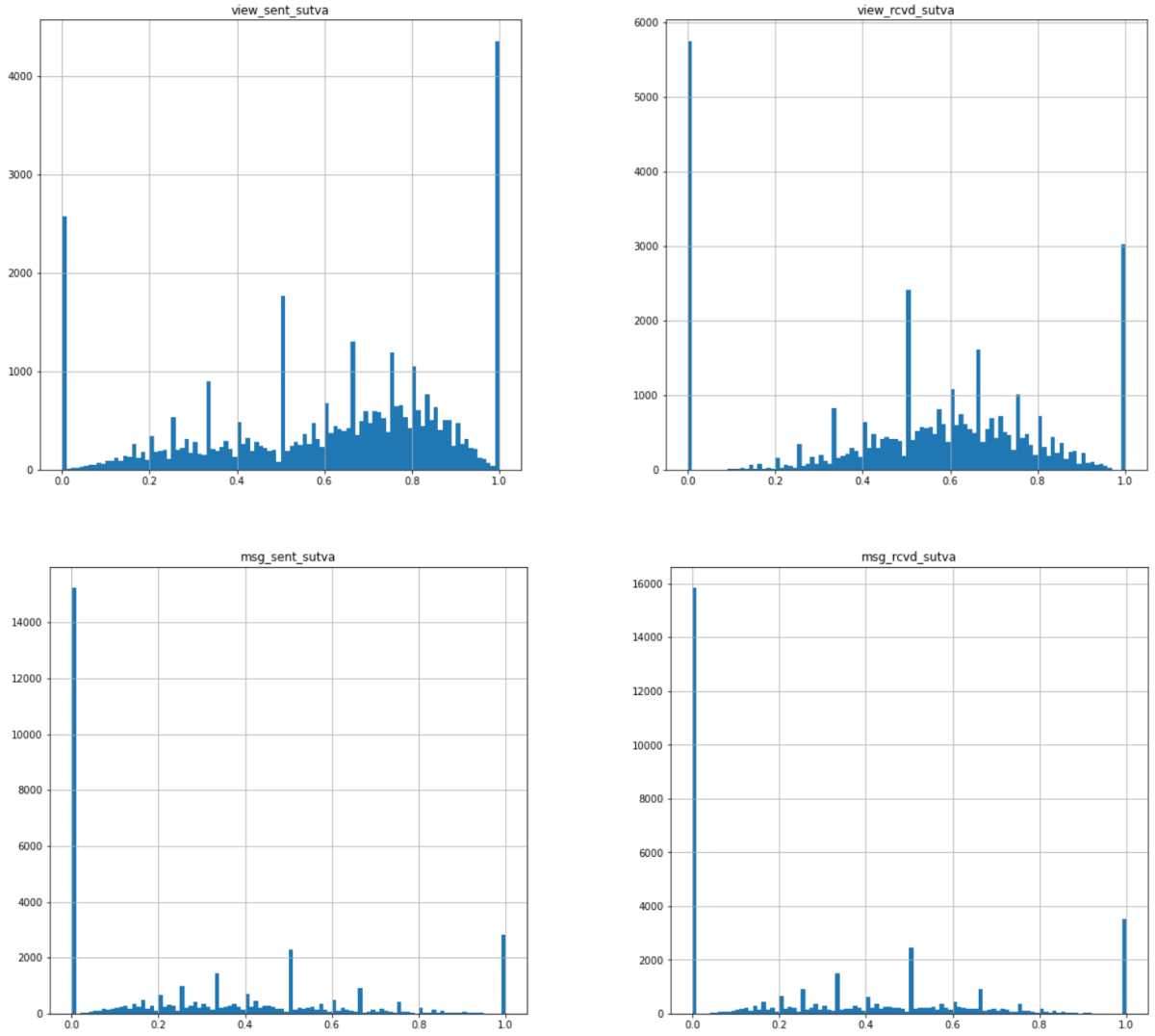
1. **Construct the underlying directed networks for user engagement and matching behavior for the pre-treatment month**. To understand this network, let's consider the 'matches sent' network. Here, the nodes represent dating platform users, which include focal users (i.e., users who eventually become part of the experiment during the experiment month) and other users to whom focal users sent a match. Any directed edge in this network, say from node A to node B, represents a match sent from node A to node B.
2. **Calculate the correction term for each focal user**. In the matches sent network, the correction term is the proportion of the focal user's neighbors who have received matches from at least another user from a target cohort. Note that the target cohort of users depend on the focal user's cohort. For example, if the focal user belongs to the treated female cohort, then the target users belong to the control female cohort. In other words, at least one individual from the target cohort and the focal user have both sent matches to a common neighbor. We term such a neighbor as an infected neighbor. Therefore, the correction term is the total number of infected neighbors divided by the total number of neighbors for a focal user. Further, the correction term calculation here is the proportion of the treated female focal user's neighbors who have received matches from at least one control group female user, in the pre-treatment period. Mathematically:

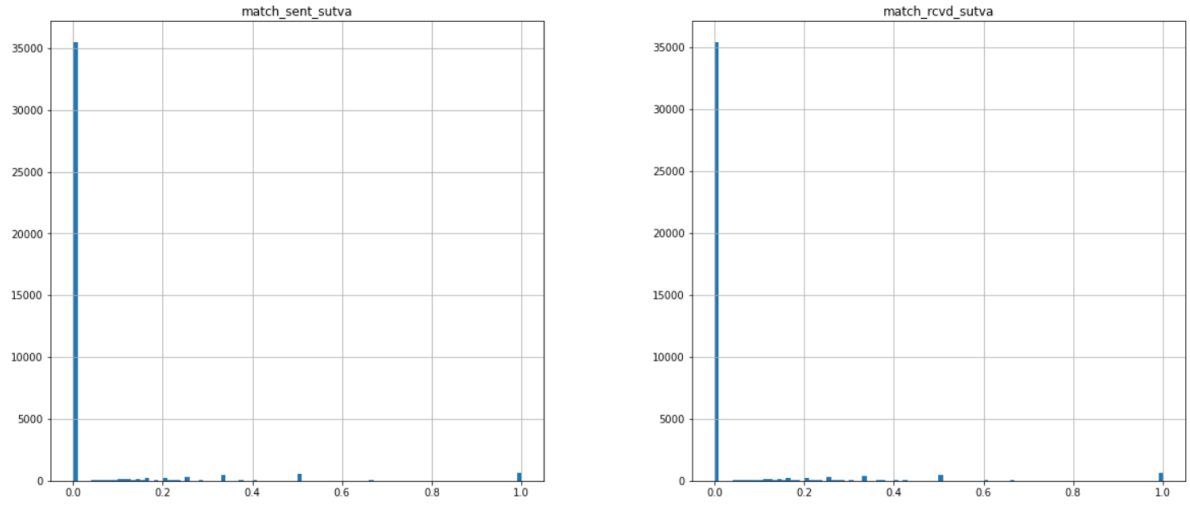
$$\boldsymbol{SUTVA\ Violation\ Correction\ Term_i} = \frac{\sum_j \boldsymbol{Infected\ Neighbor_{i,j}}}{\sum_j \boldsymbol{Neighbor_{i,j}}}$$

$$\boldsymbol{Neighbor_{i,j}} = 1\ if\ node\ j\ is\ a\ neighbor\ of\ node\ i;\ 0\ otherwise$$

$$\boldsymbol{Infected\ Neighbor_{i,j}} = 1\ if\ node\ j\ is\ a\ neighbor\ of\ i\ and\ node\ j's\ neighbors\ contain\ at\ least\ one\ user\ from\ a\ target\ cohort;\ 0\ otherwise$$

3. **Create histograms of the SUTVA violation correction term.** Here, we present histograms for the frequency distribution of the SUTVA violation correction term across six networks – views sent, views received, messages sent, messages received, matches sent, and matches received. Here, the x-axis is the value of the correction term (which is between 0 and 1), and the y-axis is the frequency (i.e., number of focal users).





4. **Add correction terms in the regression models (as suggested by Chin 2019)**. For example, if the dependent variable is match sent, then we use the corresponding correction term from the match sent network. Similarly, for other dependent variables, we use individual or multiple correction terms based on the networks involved for those analyses. This way, we deal with SUTVA violation in different contexts uniquely. For instance, the above figure clearly shows that SUTVA violation is very evident for views sent and views received networks, yet not that prominent for matches sent and matches received networks. So, we utilize the correction terms in our regressions as the context demands.

Table B2 – Female: SUTVA Corrected NB Model for Basic Outcomes

VARIABLES	(1) *ViewsReceived*	(2) *ViewsSent*	(3) *MessagesReceived*	(4) *MessagesSent*	(5) *MatchesReceived*	(6) *MatchesSent*
Treatment	0.0452*	0.0978**	0.0444	0.0635	0.1414***	0.1305**
	(0.0250)	(0.0413)	(0.0274)	(0.0397)	(0.0428)	(0.0603)
Control Variables						
Age	✓	✓	✓	✓	✓	✓
Body Types	✓	✓	✓	✓	✓	✓
Education Levels	✓	✓	✓	✓	✓	✓
Ethnicities	✓	✓	✓	✓	✓	✓
Pre-treatment activities (PC1 only)	✓	✓	✓	✓	✓	✓
SUTVA Correction Term	1.4994***	0.0527	1.0942***	0.9088***	0.9691***	0.9727**
	(0.0599)	(0.0876)	(0.0538)	(0.0864)	(0.1006)	(0.3834)
Constant Term	3.2403***	1.1976***	2.0788***	0.7910***	-0.0354	-1.7454***
	(0.1077)	(0.1675)	(0.1127)	(0.1577)	(0.1673)	(0.2259)
Observations	11171	11171	11171	11171	11171	11171

Robust standard errors in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

Table B3 – Male: SUTVA Corrected NB Model for Basic Outcomes

VARIABLES	(1) *ViewsReceived*	(2) *ViewsSent*	(3) *MessagesReceived*	(4) *MessagesSent*	(5) *MatchesReceived*	(6) *MatchesSent*
Treatment	0.0265	0.0436	0.0718***	0.0989***	0.1348***	0.1101***
	(0.0180)	(0.0278)	(0.0230)	(0.0299)	(0.0414)	(0.0332)
Control Variables						
Age	✓	✓	✓	✓	✓	✓
Body Types	✓	✓	✓	✓	✓	✓
Education Levels	✓	✓	✓	✓	✓	✓
Ethnicities	✓	✓	✓	✓	✓	✓
Pre-treatment activities (PC1 only)	✓	✓	✓	✓	✓	✓
SUTVA Correction Term	1.0801***	0.5002***	0.2913***	1.4540***	0.5680***	0.8573***
	(0.0311)	(0.0634)	(0.0362)	(0.0468)	(0.1396)	(0.0888)
Constant Term	0.3205***	2.5034***	-0.1766*	0.8983***	-2.7707***	-0.8732***
	(0.0774)	(0.1277)	(0.0950)	(0.1265)	(0.1639)	(0.1359)
Observations	28549	28549	28549	28549	28549	28549

Robust standard errors in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

Table B4 – Female: SUTVA Corrected NB Model for Advanced Outcomes

VARIABLES	(1) *VoteViewsSent*	(2) *VoteViewMessagesReceived*
Treatment	0.0944**	0.0939**
	(0.0425)	(0.0386)
Control Variables		
Age	✓	✓
Body Types	✓	✓
Education Levels	✓	✓
Ethnicities	✓	✓
Pre-treatment activities (PC1 only)	✓	✓
SUTVA Correction Terms	✓	✓
Constant Term	1.9474***	0.0881
	(0.1723)	(0.1580)
Observations	11171	11171

Robust standard errors in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

Table B5 – Male: SUTVA Corrected NB Model for Advanced Outcomes

VARIABLES	(1) *VoteViewsSent*	(2) *VoteViewMessagesReceived*
Treatment	0.0634**	0.0884***
	(0.0299)	(0.0283)
Control Variables		
Age	✓	✓
Body Types	✓	✓
Education Levels	✓	✓
Ethnicities	✓	✓
Pre-treatment activities (PC1 only)	✓	✓
SUTVA Correction Terms	✓	✓
Constant Term	2.5606***	-0.4838***
	(0.1375)	(0.1303)
Observations	28549	28549

Robust standard errors in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

Table B6 – Female: SUTVA Corrected NB Models for Match Efficiency and Time to Match Outcomes

VARIABLES	(1) $\frac{MatchesReceived}{MessagesReceived}$	(2) $\frac{MatchesSent}{MessagesSent}$	(3) Time to first match received	(4) Time to first match sent
Treatment	0.0079***	0.0055	0.1138***	0.0495
	(0.0027)	(0.0037)	(0.0340)	(0.0519)
Control Variables				
Age	✓	✓	✓	✓
Body Types	✓	✓	✓	✓
Education Levels	✓	✓	✓	✓
Ethnicities	✓	✓	✓	✓
Pre-treatment activities (PC1 only)	✓	✓	✓	✓
SUTVA Correction Terms	✓	✓	✓	✓
Constant Term	0.0647***	0.0319**		
	(0.0110)	(0.0137)		
Observations	8,462	4,889	10,218	10,218

Note. Models (1) and (2) uses ordinary least square regression, while Models (3) and (4) uses Cox-Proportional Hazard model. Robust standard errors in parentheses.
*** p < 0.01, ** p < 0.05, * p < 0.1

Table B7 – Male: SUTVA Corrected NB Models for Match Efficiency and Time to Match Outcomes

VARIABLES	(1) $\frac{MatchesReceived}{MessagesReceived}$	(2) $\frac{MatchesSent}{MessagesSent}$	(3) Time to first match received	(4) Time to first match sent
Treatment	0.0034	0.0020	0.1356***	0.0902***
	(0.0032)	(0.0031)	(0.0385)	(0.0270)
Control Variables				
Age	✓	✓	✓	✓
Body Types	✓	✓	✓	✓
Education Levels	✓	✓	✓	✓
Ethnicities	✓	✓	✓	✓
Pre-treatment activities (PC1 only)	✓	✓	✓	✓
SUTVA Correction Terms	✓	✓	✓	✓
Constant Term	0.0823***	0.1035***		
	(0.0126)	(0.0127)		
Observations	11,682	11,522	24,115	24,115

Note. Models (1) and (2) uses ordinary least square regression, while Models (3) and (4) uses Cox-Proportional Hazard model. Robust standard errors in parentheses.
*** p < 0.01, ** p < 0.05, * p < 0.1

Table B8 – Female: SUTVA Corrected NB Model for Heterogeneity Analysis by Desirability

	VARIABLES	(1) *MatchesReceived*	(2) *MatchesSent*
(1)	Treatment	0.4638***	0.8603***
		(0.1595)	(0.2676)
(2)	Focal User's Desirability (High)	0.9804***	0.6419***
		(0.1449)	(0.2444)
(3)	Focal User's Desirability (Medium)	0.9480***	1.0644***
		(0.1468)	(0.2493)
(4)	Targeting Users' Desirability (High)	-0.0460	0.9104***
		(0.1575)	(0.2539)
(5)	Targeting Users' Desirability (Medium)	0.3906**	0.2310
		(0.1709)	(0.3106)
(6)	Focal User's Desirability (High) ✶ Targeting Users' Desirability (High)	0.1415	-0.5636*
		(0.1981)	(0.3011)
(7)	Focal User's Desirability (Medium) ✶ Targeting Users' Desirability (High)	-0.1151	-1.0687***
		(0.2003)	(0.3107)
(8)	Focal User's Desirability (High) ✶ Targeting Users' Desirability (Medium)	-0.3489*	-0.1956
		(0.2041)	(0.3471)
(9)	Focal User's Desirability (Medium) ✶ Targeting Users' Desirability (Medium)	-0.4110*	-0.3562
		(0.2103)	(0.3590)
(10)	Treatment ✶ Focal User's Desirability (High)	-0.3262*	-0.6954**
		(0.1951)	(0.3099)
(11)	Treatment ✶ Focal User's Desirability (Medium)	-0.6584***	-1.1806***
		(0.2043)	(0.3303)
(12)	Treatment ✶ Targeting Users' Desirability (High)	0.1888	-1.0081***
		(0.2146)	(0.3376)
(13)	Treatment ✶ Targeting Users' Desirability (Medium)	-0.5215**	-0.4754
		(0.2400)	(0.4057)
(14)	Treatment ✶ Focal User's Desirability (High) ✶ Targeting Users' Desirability (High)	-0.3530	0.8454**
		(0.2721)	(0.4049)
(15)	Treatment ✶ Focal User's Desirability (Medium) ✶ Targeting Users' Desirability (High)	0.2132	1.4357***
		(0.2762)	(0.4234)
(16)	Treatment ✶ Focal User's Desirability (High) ✶ Targeting Users' Desirability (Medium)	0.4514	0.4811
		(0.2859)	(0.4585)
(17)	Treatment ✶ Focal User's Desirability (Medium) ✶ Targeting Users' Desirability (Medium)	0.9497***	1.1442**
		(0.2956)	(0.4795)
(18)	Constant Term	-0.8471***	-2.5765***
		(0.1989)	(0.3077)
	Control Variables –		
	Age, Body Types, Education Levels, Ethnicities	✓	✓
	Pre-treatment activities (PC1 only)	✓	✓
	SUTVA correction term	✓	✓
	Observations	10218	10218

Robust standard errors in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

Table B9 – Male: SUTVA Corrected NB Model for Heterogeneity Analysis by Desirability

	VARIABLES	(1) *MatchesReceived*	(2) *MatchesSent*
(1)	Treatment	0.5404**	0.1270
		(0.2298)	(0.1253)
(2)	Focal User's Desirability (High)	1.8963***	1.7529***
		(0.1969)	(0.1114)
(3)	Focal User's Desirability (Medium)	1.0765***	0.5300***
		(0.2074)	(0.1149)
(4)	Targeting Users' Desirability (High)	0.0051	-0.5721***
		(0.2657)	(0.1495)
(5)	Targeting Users' Desirability (Medium)	0.3274	-0.2453
		(0.2606)	(0.1494)
(6)	Focal User's Desirability (High) ✶ Targeting Users' Desirability (High)	0.1545	0.5436***
		(0.2814)	(0.1699)
(7)	Focal User's Desirability (Medium) ✶ Targeting Users' Desirability (High)	-0.2896	0.4679***
		(0.3059)	(0.1810)
(8)	Focal User's Desirability (High) ✶ Targeting Users' Desirability (Medium)	-0.1401	0.1171
		(0.2750)	(0.1681)
(9)	Focal User's Desirability (Medium) ✶ Targeting Users' Desirability (Medium)	-0.2187	0.2941
		(0.2960)	(0.1804)
(10)	Treatment ✶ Focal User's Desirability (High)	-0.3644	-0.0233
		(0.2498)	(0.1516)
(11)	Treatment ✶ Focal User's Desirability (Medium)	-0.5543**	-0.1806
		(0.2682)	(0.1591)
(12)	Treatment ✶ Targeting Users' Desirability (High)	-0.3052	0.3059
		(0.3464)	(0.2001)
(13)	Treatment ✶ Targeting Users' Desirability (Medium)	-0.3631	-0.0336
		(0.3433)	(0.2075)
(14)	Treatment ✶ Focal User's Desirability (High) ✶ Targeting Users' Desirability (High)	0.1433	-0.3972*
		(0.3694)	(0.2300)
(15)	Treatment ✶ Focal User's Desirability (Medium) ✶ Targeting Users' Desirability (High)	0.5488	0.0125
		(0.4042)	(0.2453)
(16)	Treatment ✶ Focal User's Desirability (High) ✶ Targeting Users' Desirability (Medium)	0.3958	0.0811
		(0.3643)	(0.2344)
(17)	Treatment ✶ Focal User's Desirability (Medium) ✶ Targeting Users' Desirability (Medium)	0.3356	0.0901
		(0.3970)	(0.2521)
(18)	Constant Term	-3.9816***	-1.6514***
		(0.2378)	(0.1557)
	Control Variables –		
	Age, Body Types, Education Levels, Ethnicities	✓	✓
	Pre-treatment activities (PC1 only)	✓	✓
	SUTVA Correction term	✓	✓
	Observations	24115	24115

Robust standard errors in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

Table B10 – Female: SUTVA Corrected NB Model for Robustness Related Outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Monthly Level		Weekly Level				
TIME FRAMES	Month 2	Month 3	Month 2 Week 1	Month 2 Week 2	Month 2 Week 3	Month 2 Week 4	Month 3 Week 1
Treatment	0.1414***	0.0428	0.1664***	0.1100**	0.0938*	0.1477**	-0.0327
	(0.0428)	(0.0513)	(0.0494)	(0.0533)	(0.0556)	(0.0577)	(0.0598)
Control Variables							
Age	✓	✓	✓	✓	✓	✓	✓
Body Types	✓	✓	✓	✓	✓	✓	✓
Education Levels	✓	✓	✓	✓	✓	✓	✓
Ethnicities	✓	✓	✓	✓	✓	✓	✓
Pre-treatment activities (PC1 only)	✓	✓	✓	✓	✓	✓	✓
SUTVA Correction Term	0.9691***	1.0017***	1.1049***	0.8729***	0.7851***	0.8407***	0.9689***
	(0.1006)	(0.1215)	(0.1104)	(0.1218)	(0.1281)	(0.1324)	(0.1362)
Constant Term	-0.0354	-0.0827	-1.3002***	-1.2084***	-1.1969***	-1.5149***	-1.3720***
	(0.1673)	(0.2016)	(0.1866)	(0.2024)	(0.2118)	(0.2205)	(0.2293)
Observations	11171	11171	11171	11171	11171	11171	11171

Notes. Month 2 is the experiment month, and Month 3 is the post-experiment month. The dependent variable for columns (1) to (7) is MatchesReceived. Robust standard errors in parentheses.

*** p < 0.01, ** p < 0.05, * p < 0.1

Table B11 – Male: SUTVA Corrected NB Model for Robustness Related Outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Monthly Level		Weekly Level				
TIME FRAMES	Month 2	Month 3	Month 2 Week 1	Month 2 Week 2	Month 2 Week 3	Month 2 Week 4	Month 3 Week 1
Treatment	0.1348***	0.0290	0.1403**	0.1820***	0.1831***	0.0123	0.0789
	(0.0414)	(0.0465)	(0.0636)	(0.0671)	(0.0710)	(0.0724)	(0.0739)
Control Variables							
Age	✓	✓	✓	✓	✓	✓	✓
Body Types	✓	✓	✓	✓	✓	✓	✓
Education Levels	✓	✓	✓	✓	✓	✓	✓
Ethnicities	✓	✓	✓	✓	✓	✓	✓
Pre-treatment activities (PC1 only)	✓	✓	✓	✓	✓	✓	✓
SUTVA Correction Term	0.5680***	0.6231***	0.6236***	0.7200***	0.5947***	0.5790**	0.5575**
	(0.1396)	(0.1566)	(0.2015)	(0.2065)	(0.2271)	(0.2323)	(0.2384)
Constant Term	-	-	-	-	-	-	-
	2.7707***	2.9239***	4.1480***	4.1010***	4.4223***	3.8127***	4.0813***
	(0.1639)	(0.1816	(0.2565)	(0.2659)	(0.2853)	(0.2772)	(0.2829)
Observations	28549	28549	28549	28549	28549	28549	28549

Notes. Month 2 is the experiment month, and Month 3 is the post-experiment month. The dependent variable for columns (1) to (7) is MatchesReceived. Robust standard errors in parentheses.

*** p < 0.01, ** p < 0.05, * p < 0.1