

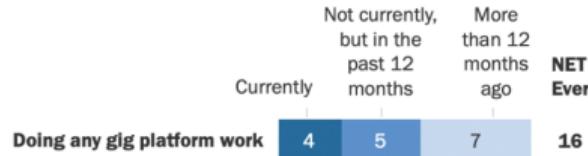
Gratuities in a Digital Services Marketplace

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University of California, San Diego
Work in progress

16% of Americans have ever earned money on online gig platforms

% of U.S. adults who say they have earned money by ...



This includes:

Jobs via platforms that directly connect people with others who want to hire them	Making deliveries from a restaurant or store for a delivery app	1	3	3	7
	Performing household tasks or running errands	1	2	3	6
	Driving for a ride-hailing app	1	1	2	5
	Shopping for or delivering groceries or household items	1	2	1	4
	Doing something else	1	1	2	4
	Using a personal vehicle to deliver packages to others via an app or website	1	1	1	3

Note: Gig platform work refers to earning money by using a mobile app or website to find jobs that directly connect workers with people who want to hire them, or by using a personal vehicle to deliver packages to others. Figures may not add up to the NET values due to rounding. Those who did not give an answer are not shown.

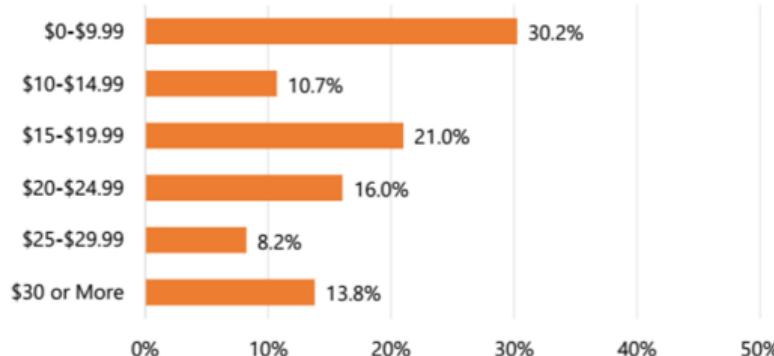
Source: Survey of U.S. adults conducted Aug. 23-29, 2021.

"The State of Gig Work in 2021"

PEW RESEARCH CENTER

Figure 14: Distribution of Imputed Wages After Expenses for App-Based Drivers

Distribution of Estimated Net Wages for App-Based Drivers



Source(s): Authors' analysis of a November 2021 through March 2022 survey of 502 app-based drivers in and around the Chicago metropolitan area ([Qualtrics, 2022](#)).

were limited to respondents with positive earnings and the income from app-based driving after expenses for both questions.

Figure 29: Main Reason for Working a "Gig Economy" Job, Sample

"What is Your Main Reason for Working a 'Gig Economy' Job?"	N =	Pct.
<u>Flexibility and/or Preference</u>	<u>251</u>	<u>50.0%</u>
<i>I Enjoy the Work</i>	123	24.5%
<i>I Prefer Being an Independent Contractor Instead of an Employee</i>	61	12.2%
<i>I Need Flexible Schedules Because of Caregiving Responsibilities</i>	58	11.6%
<i>I Need Flexible Schedules Because I Am Enrolled in Classes</i>	9	1.8%
<u>Out of Necessity</u>	<u>238</u>	<u>47.4%</u>
<i>I Need Additional Income to Supplement Earnings from My Other Job</i>	186	37.1%
<i>I Can't Find a Non-Gig Job that Pays Enough or Provides Enough Hours</i>	43	8.6%
<i>I Experienced Job Discrimination When Seeking Non-Gig Employment</i>	9	1.8%
Another Reason	13	2.6%
Total Sample	502	100.0%

Source(s): Authors' analysis of a November 2021 through March 2022 survey of 502 app-based drivers in and around

Uber

← Tuesday to 1455 Market St



★ ★ ★ ★ ★

Give a compliment

Add a tip for David

\$1 \$2 \$5

Enter Custom Amount

DONE

lyft

\$15.84 520-84 ⓘ

Add tip

No tip	18% \$3.18	20% \$3.53	25% \$4.42	...
--------	---------------	---------------	---------------	-----

VISA + Promo

Rate your ride



GREAT

Awesome! What went well?

Good Driving

Friendly Driver

Clean Car

Fun Conversation

Share with Lyft

GRUBHUB

DOORDASH

Your order

Royal Thai

Delivery, ASAP (55-65 mins)

Change

+ Add more items

2. 2. Steamed Shrimp Dumpling \$15.98

ea \$7.99

1 36. Panang Curry \$13.50

Chicken
Jasmine White Rice

Items subtotal: \$29.48

Sales tax: \$2.95

Total: \$32.43

X Empty bag



\$ Select a tip amount	15% \$4.86
Cash Tip	10% \$3.24
	15% \$4.86
	20% \$6.49
	Custom

Continue to checkout: \$37.29



Restaurants



My Grubhub



Bag



Checkout

Delivery Details

Address

Drop-off

Leave it at my door

Add more details

Phone Number

Send as a gift

New >

Delivery Times

ASAP

25 - 35mins

Scheduled

Choose a time >

Payment

Dasher Tip ⓘ

\$3.00

\$2

\$3

\$4

Other

The recommended Dasher tip is based on the delivery distance and effort. 100% of the tip goes to your Dasher.

Payment

Apple Pay >



\$17.04

\$5.88 tip

No Tip	10%	15%	20%	25%
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Tips are optional and 100% goes to the Tasker.

Submit



I'm BACK ... in 2k ... fighting CRABS ...
5.8K views · 5 days ago

Barbara 17K subscribers SUBSCRIBED

Comments 2.5K

Thanks

This playthrough was AMAZING, love it!

Buy Super Thanks

Thank Barbara

Buy yourself an animated Super Thanks. As an added bonus, we'll post the following public comment on your behalf. Learn more

Bonus

Laura Mipsum \$2.00 Thanks!

\$2.00 \$5.00 \$10.00 \$50.00



9:41

Ashley Jackson @ashjackson Following

2043 followers 1168 following

Director of Brand at Purdie. Ready to meet

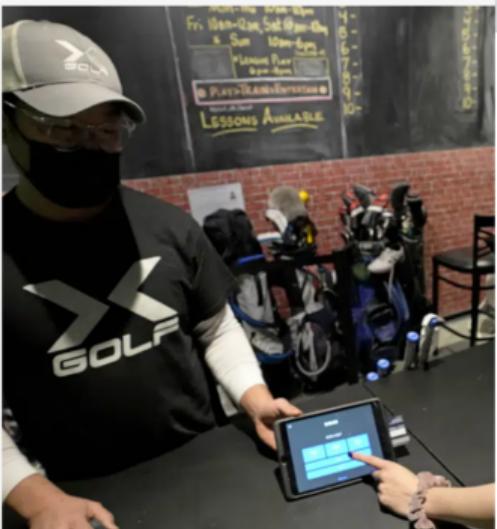
Ashley Jackson Back

Send Ashley \$20

Visa 1234 \$0.91 Fee >

Is tipping getting out of control? Many consumers say yes

By HALELUYA HADERO January 28, 2023



Why is tipping so confusing now?

ABC News' Trevor Ault seeks to get to the bottom of why tipping can seem so confusing, as people express frustration over "tipping fatigue."

February 13, 2023

Haleluya Hadero

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Click to copy

NEW YORK (AP) — Across the country, there's a silent frustration brewing about an age-old practice that many say is getting out of hand: tipping.

Some fed-up consumers are posting rants on social media complaining about tip requests at drive-thrus, while others say they're tired of being asked to leave a gratuity for a muffin or a simple cup of coffee at their neighborhood bakery. What's next, they wonder — are we going to be tipping our doctors and dentists, too?

As more businesses adopt digital payment methods, customers are automatically being prompted

Our research questions / contributions

- ① Can platforms appeal to specific tipping motivations to increase tipping?
- ② How can platforms measure tip request effects on {tips, orders, ratings, spending, etc}: new vs repeat buyers, SR vs LR, buyers vs sellers?
- ③ What buyer and seller factors moderate tipping norm compliance? (*in progress*)

Why you might care

- Tips directly pay providers, many of whom are vulnerable
- Possible indirect effects:
Service effort, quality, personalization & satisfaction; Price, quantity, repatronage
- “Platform Analytics,” Global marketplace, Nudge
- Why not? Design flaw, untested treatments, external validity

What we'll do today

- ① Tipping theory & literature: What do we know?
- ② Context, descriptives
- ③ Field experiment: Design, causal effects, 2 post-test analyses
- ④ Longer-term analyses & moderators
- ⑤ *Pause for questions?*

Why do consumers give tips? Azar (2010) asked them

Table 1
Reasons Given for Tipping

Reason for tipping	United States	Israel
1. Avoid feeling guilty	60.2%	13.3%
2. Avoid embarrassment	44.1%	23.2%
3. Tipping being a social norm	84.7%	58.1%
4. Show gratitude	67.8%	68.9%
5. Waiters depend on tips	66.9%	32.4%
6. Get poor future service if I don't tip	13.6%	2.5%
7. The waiter may yell at me if I don't tip	4.2%	0.0%
Total number of reasons	3.42	1.98
Number of observations	118	241

Why do consumers give tips?

- Lynn (2015):
 - ▶ Helping servers, rewarding service, buying future service, buying social esteem, sense of duty or obligation
 - ▶ Tipping norms develop and evolve: Initially, some consumers use tips to buy better service, then tips become necessary to receive good service, then tips become expected and customary
 - ▶ Tipping norms can become ingrained: Customary tips still given after poor service

Why do consumers give tips?

- Lynn (2016):

Table 2

Means, and pattern loadings from a principle components analysis with Promax rotation, of rated strength of various motives' effect on participants' decisions about tipping restaurant waiters and waitresses.

	Mean Rating	Component			
		1	2	3	4
		Service/ Esteem Motives	Altruistic Motives	Duty Motives	Reciprocity Motives
Get Server to Remember Me	2.9	.969	-.088	-.219	.178
Get Better Service Next Time	3.2	.877	-.148	-.127	.290
Gain Server's Liking	2.8	.827	.062	-.042	-.003
Get Server's Respect	2.8	.733	.184	-.056	-.100
Make Good Impression	2.8	.609	-.153	.353	-.101
Make Up for Low Server Wages	4.4	-.078	.956	-.042	-.106
Help Server	4.7	-.070	.945	-.036	.026
Comply with Tipping Norms	4.4	-.184	-.018	.945	.298
Fulfill Obligation	4.0	.010	-.018	.859	.063
Reward Service	5.2	.073	-.020	.222	.895
Repay Server's Effort	4.9	.057	.500	.060	.507
Make Server Happy	4.1	.303	.538	.050	.157
Avoid Upsetting Server	3.0	.485	.152	.249	-.246
Avoid Making a Bad Impression	3.0	.547	.016	.316	-.252
Coefficient Alpha of Index		.85	.87	.69	NA
Formed by Items in Grey					

Digital mediated payments: Tips are requested, not just given

- Haggag and Paci (2014), Donkor (2021): NYC taxis, avg tip rate = **97-98%**
 - ▶ HP quasi-experiment:
(\$2, \$3, \$4, Custom) to (20%, 25%, 30%, Custom) at \$15 raised avg tip 10% at threshold
 - ▶ D: $U(\text{tipping})=f(\text{Idiosyncratic ethical-ideal tip}, \text{norm noncompliance cost}, \text{calculation cost})$
 - ▶ D: Model+data imply large costs of norm noncompliance and tip calculation
- Chandar, Gneezy, List, Muir (2019)
 - ▶ Uber tipping, avg tip rate = **16%**
 - ▶ Experiment: (\$1, \$3, \$5) to (\$2, \$4, \$6) raised avg tip from \$0.467 to \$0.479
 - ▶ “defaults affect tip levels, but are much less powerful than ... in the taxi cab industry.”
 - ▶ Why? Speculation: Tips after rider left driver's presence are less interpersonal
- Alexander, Boone, Lynn (2021)
 - ▶ (10%, 15%, 20%) to (15%, 20%, 25%) raised avg tip from \$4.70 to \$5.63, but reduced tip rate from **58% to 50%**
 - ▶ Default tips did not significantly change customer satisfaction, repatronage or spending

Tipping in Digitally Intermediated Contexts

- Duhaime and Woessner (2019):
 - ▶ Buyers tip employees more than autonomous gig workers
- Chen, Xu, Rodas, Liu (2023):
 - ▶ Ratings reward service, so tips increase when tips precedes ratings
- Lu, Yao, Chen, Grewal (2021):
 - ▶ Larger apparent audience sizes reduced tips to live streamers audience size
- In sum: Digital tipping responds to contextual factors, but no one has directly appealed to tipping motivations

Empirical Context: Fiverr

1. **Discovery** Buyer searches or explores service listings, like graphic design, copy editing, professional translation, or digital marketing
2. **Order** Buyer contacts seller(s) about service attributes, price, delivery date, specific reqs. Buyer pays Fiverr upon ordering
3. **Delivery** Seller delivers the work via Fiverr. Buyer confirms work matches reqs, then Fiverr pays seller
4. **Rating and Tip** Fiverr asks buyer to rate, then asks buyer to tip

Original Tip Request and Default Tips: Control condition

Would You Like To Leave A Tip To Cheniouseller?

You won't be charged yet. Service fees apply.

\$5.00

\$10.00

Custom Tip

Later

Tip Now

(a) When price $\leq \$25$

Would You Like To Leave A Tip To Cheniouseller?

You won't be charged yet. Service fees apply.

20%

30%

Custom Tip

Later

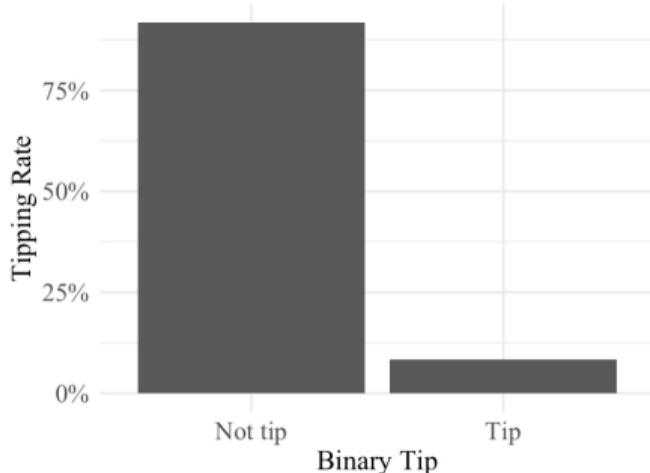
Tip Now

(b) When price $> \$25$

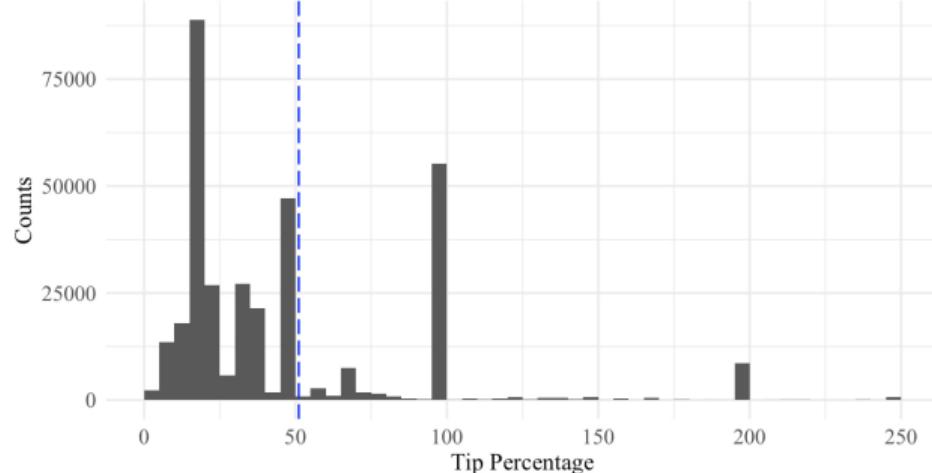
Pre-Experiment Data

- 4.1MM transactions between 1.3MM buyers and 171K sellers
 - ▶ \$152MM in total spending, inc. \$3.9MM in 341K tips
- Period: 01/01/2019–06/09/2019
- Buyer & seller IDs, regions, limited demos, order categories; transaction char: orders, prices, tips, ratings, seller tip mentions

Tipping Rate and Tip Percentages



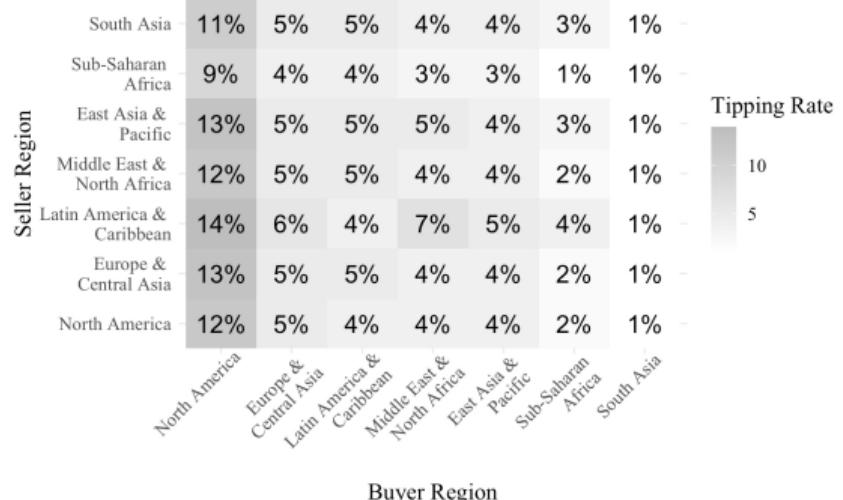
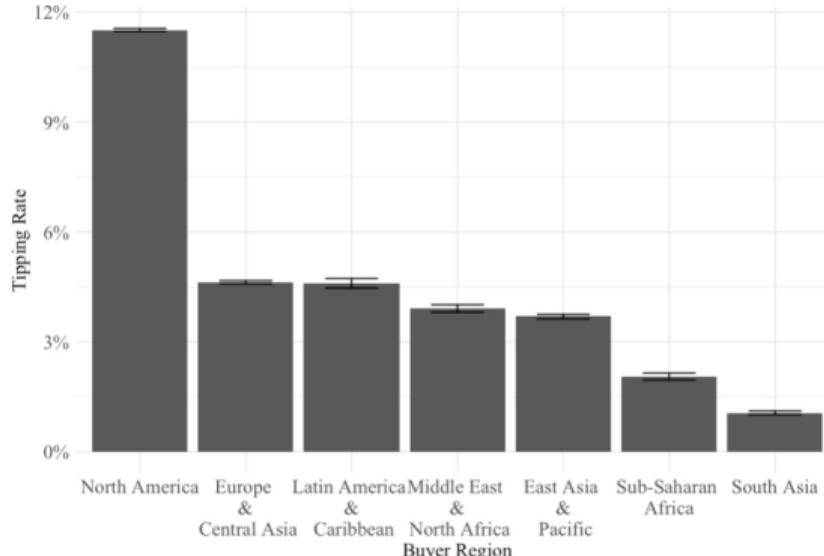
(a) Tipping Rate



(b) Tip Percentages

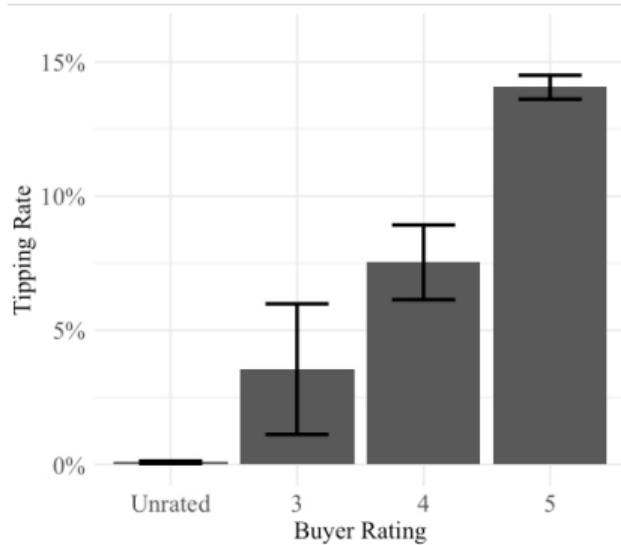
- Buyers tipped sellers in 8.3% of transactions overall
- Among tipped transactions, the average tip observed is 52% of the order price

Key Fact I: Buyer region predicts tipping more strongly than seller region

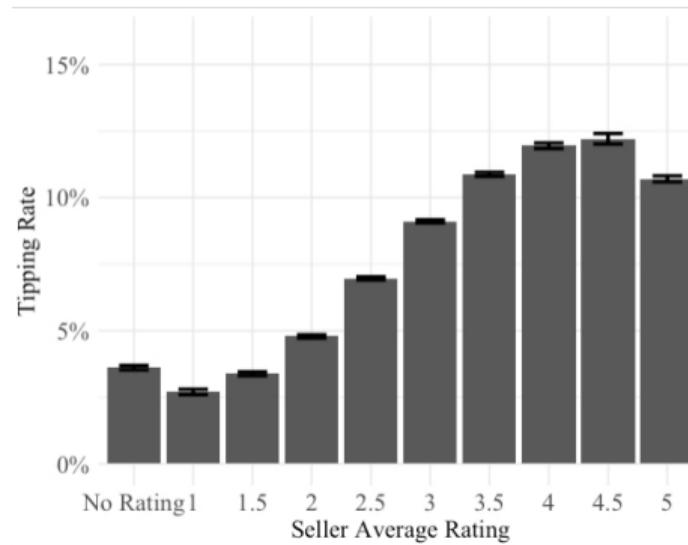


- North Americans tipped in 11.5% of all transactions

Key Fact II: Buyer tipping increases with satisfaction rating



(a)



(b)

- TR was four times higher among 5-star transactions than 3-star transactions
- TR increases with sellers' average rating

Table A1 Variables and Summary Statistics in Pre-Treatment Transaction Data

	Mean	Standard Deviation
<i>Buyer Characteristics X^B</i>		
Buyer Prior Orders	10.51	42.89
Buyer Prior Ratings	9.03	31.22
Buyer Average Rating (Given)	4.96	0.15
Buyer Prior Tips	0.51	2.98
Buyer Tenure (Months)	20.97	25.21
User-defined Female	1.20%	
User-defined Male	3.11%	
<i>Transaction Characteristics X^T</i>		
Buyer-Seller Repeat Indicator	29.93%	
Count of Buyer-Seller Repeat Orders	1.78	9.21
Buyer Rating = 3	0.53%	
Buyer Rating = 4	3.34%	
Buyer Rating = 5	56.55%	
Price	\$ 36.86	\$ 82.29
Seller Tip Mention	2.98%	
<i>Seller Characteristics X^S</i>		
Seller Prior Orders	225.1	641.84
Seller Prior Ratings	120.90	337.99
Seller Average Rating (Received)	4.95	0.07

Note: Buyer Region, Seller Region, and Seller Category are also observed but excluded for brevity.

Key Fact III: Buyer characteristics, seller characteristics, and transaction characteristics all help to predict tipping, but buyer effects matter most

	(1)	(2)	(3)	(4)	(5)
Category FE	Y	Y	Y	Y	Y
Buyer Region FE		Y		Y	
Seller Region FE	Y	Y	Y		
Buyer FE			Y		Y
Seller FE				Y	Y
Observations	3,439,974	3,439,974	3,439,974	3,439,974	3,439,974
R ²	0.115	0.127	0.505	0.185	0.533
Adjusted R ²	0.115	0.127	0.398	0.155	0.407

Field Experiment: 2 Constraints

- Testing software constrained experiment to 4 conditions
 - ▶ Status quo was an obvious control
 - ▶ We wanted to test injunctive Norm without sellername. Controversial
 - ▶ Tested Implicit Reciprocity without sellername, and Reciprocity with sellername
 - ★ Tip request timing implied reciprocity motivation might be salient
- CFO included new default tips condition with Reciprocity and Norm messages
 - ▶ Default tips effect depends on default tips manipulation size:
Imagine \$5→\$500 or 30%→ 30.01%
 - ▶ Recent data: Default tips change was minor adjustment
 - ▶ We can separate message & default effects using post-experiment data
- Despite imperfections, a rare instance of platform design manipulation and results

Field Experiment Design

Tip Request Treatments

Thanks For Your Review!

Show your appreciation to your seller by giving a tip.

You won't be charged yet. Service fees apply.

\$5	\$10	<input checked="" type="checkbox"/> Custom
-----	------	--

Later

Tip Now

(a) Implicit Reciprocity

Thanks For Your Review!

Leave eliranseller a tip to show your appreciation for a job well done.

You won't be charged yet. Service fees apply.

\$5	\$10	\$15	<input checked="" type="checkbox"/> Custom
-----	------	------	--

Later

Tip Now

(b) Reciprocity

Thanks For Your Review!

It's customary to leave a tip for the seller's service.

You won't be charged yet. Service fees apply.

\$5	\$10	\$15	<input checked="" type="checkbox"/> Custom
-----	------	------	--

Later

Tip Now

(c) Norm

Treatment Manipulation Analysis

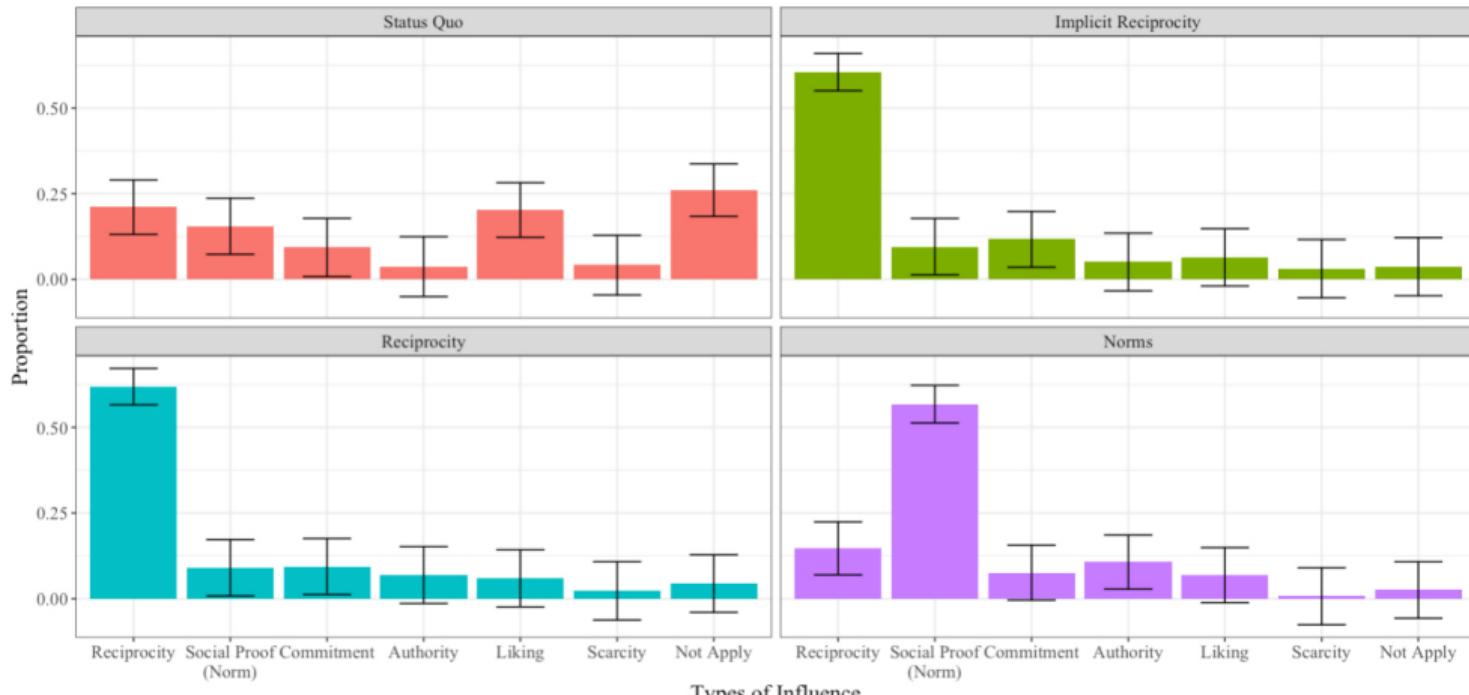
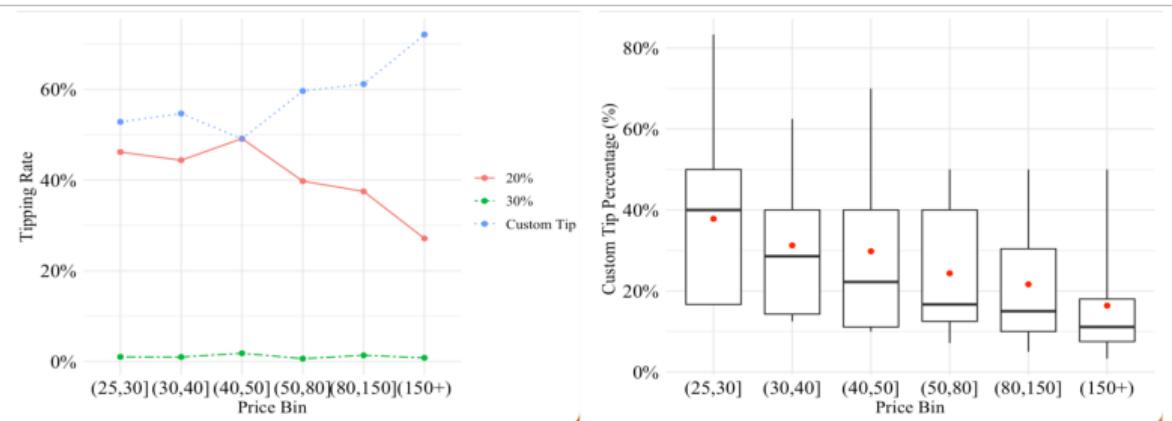
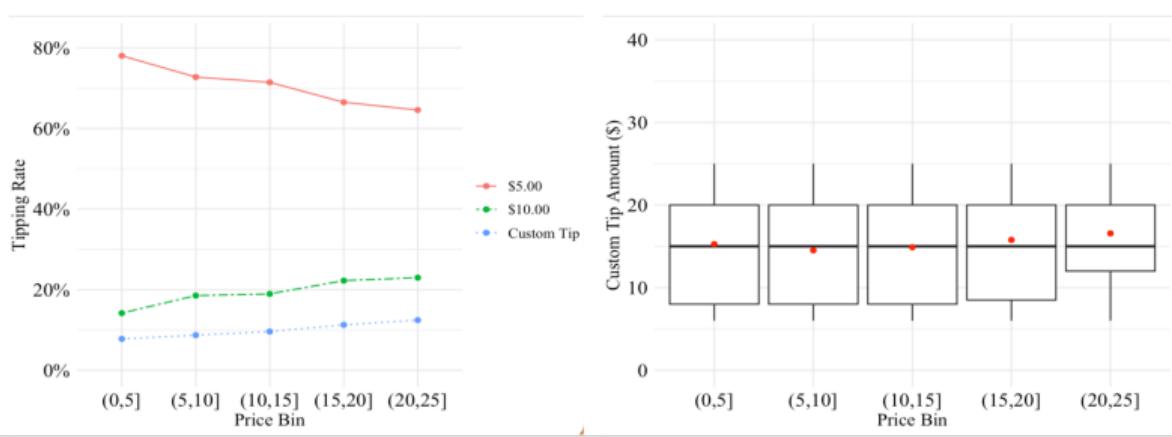
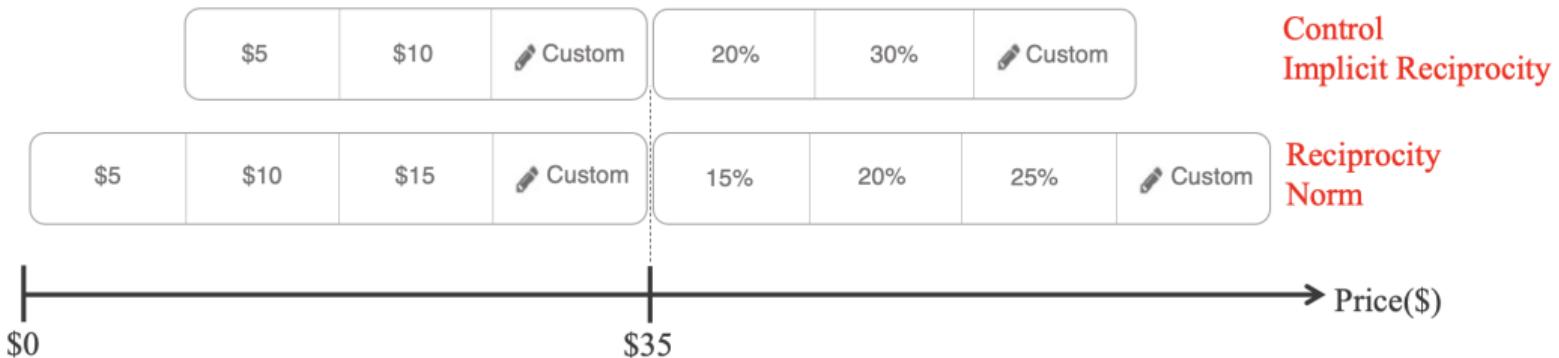


Figure: Perception for Each Tip Message



Field Experiment Design

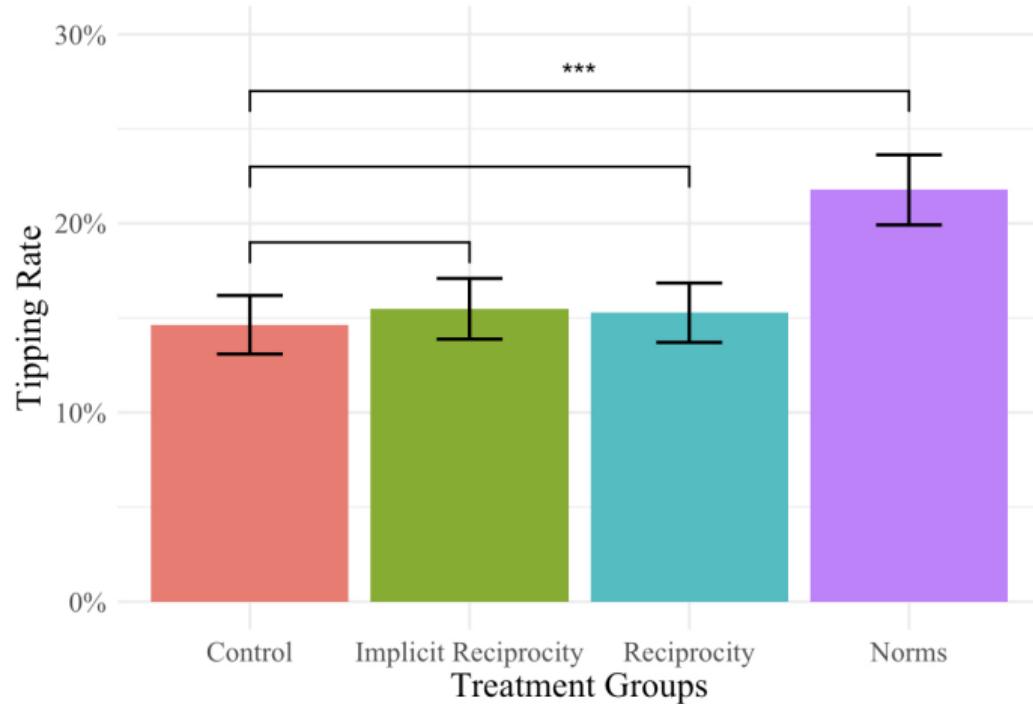
Default Tip Manipulation



Field Experiment: Sample

- Predetermined 4 weeks, 06/10/2019-07/07/2019
- Randomly assigned all 40,823 repeat buyers and 7,880 new buyers
- Treatment occurs after buyer's first rating, then held constant
 - ▶ 1st treatment is truly exogenous; buyers may self-select into repeated treatment
- We distinguish new vs repeat buyers, and buyer order numbers during test

Nonparametric TEs: New Buyers 1st Treated Transaction



Specification for New Buyers

- Fixed Effect Regression

$$y_i = \sum_{M=1}^3 \beta_1^{M_i} \text{Treat}_{M_i} + \beta_2 X_i^B + \beta_3 X_i^T + \beta_4 X_i^S + \epsilon_i$$

$$y_i = \begin{cases} 1, & \text{tip is observed} \\ 0, & \text{otherwise} \end{cases}$$

$$\text{Treat}_{M_i} = \begin{cases} 1, & \text{if buyer is under treatment M} \\ 0, & \text{otherwise} \end{cases}$$

$M_i \in \{\text{Implicit Reciprocity, Reciprocity, Norm}\}$

X_i^B = Buyer prior {Orders, Ratings, Tips}, Region, Tenure, User-defined gender

X_i^T = Rating, price, price², seller tip mention, category, repeat indicator and count

X_i^S = Seller prior {Orders, Ratings}, Region

Specification for New Buyers

- Fixed Effect Regression

$$y_i = \sum_{M=1}^3 \beta_1^{M_i} \text{Treat}_{M_i} + \beta_2 X_i^B + \beta_3 X_i^T + \beta_4 X_i^S + \epsilon_i$$

- Estimate treatment effects separately
 1. All test-period transactions
 2. New buyers' first transactions
 3. New buyers' second transactions
 4. New buyers' third transactions

New Buyers Tipping Regression

	Pool (1)	First (2)	Second (3)	Third (4)
Implicit_Reciprocity	0.001 (0.006)	0.011 (0.011)	-0.013 (0.009)	0.003 (0.012)
Reciprocity	0.005 (0.006)	0.006 (0.011)	-0.003 (0.010)	0.006 (0.012)
Norms	0.035*** (0.007)	0.071*** (0.012)	0.015 (0.010)	0.008 (0.013)
Category FE	Y	Y	Y	Y
Buyer Region FE	Y	Y	Y	Y
Seller Region FE	Y	Y	Y	Y
Observations	25,215	7,880	7,258	3,545
Number of Buyers	7,880	7,880	7,258	3,545
R ²	0.161	0.077	0.242	0.335
Adjusted R ²	0.160	0.073	0.238	0.329

Note:

** p<0.05; *** p<0.01

Treatment Effect on Repeat Transaction

New Buyers

$$y_i = \sum_{M=1}^3 \beta_1^{M_i} \text{Treat}_{M_i} + \beta_2 X_i^B + \beta_3 X_i^T + \beta_4 X_i^S + \epsilon_i$$

- Estimate treatment effects on new buyers' repeat purchases during the sample period separately
 1. Second Order Exists with new buyers' **first** transactions

$$Y_i = \begin{cases} 1, & \text{a new buyer completed a second transaction during the sample period} \\ 0, & \text{otherwise} \end{cases}$$

2. Third Order Exists with new buyers' **second** transactions

$$Y_i = \begin{cases} 1, & \text{a new buyer completed a third transaction during the sample period} \\ 0, & \text{otherwise} \end{cases}$$

- X_i^B, X_i^T, X_i^S : buyer, transaction, and seller characteristics

New Buyer Repeat Transaction Regression

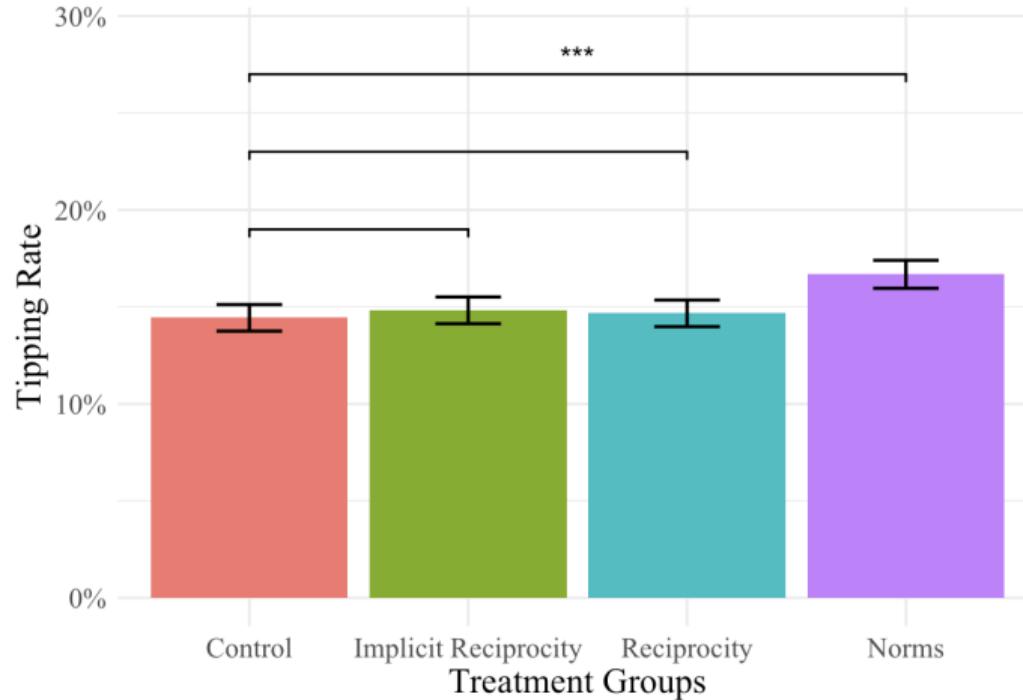
	Second Order Exists (1)	Third Order Exists (2)
Implicit_Reciprocity	0.005 (0.008)	0.011 (0.016)
Reciprocity	-0.006 (0.009)	-0.017 (0.016)
Norms	0.008 (0.008)	0.012 (0.017)
Category FE	Y	Y
Buyer Region FE	Y	Y
Seller Region FE	Y	Y
Observations	7,880	7,258
Number of Buyers	7,880	7,258
R ²	0.024	0.028
Adjusted R ²	0.020	0.024

Note:

** p<0.05; *** p<0.01

- Norms and Implicit Reciprocity treatments led to slightly more repeat purchases on average
- None of the effects were statistically significant

Nonparametric TEs: Repeat Buyers 1st Treated Transaction



Identification Strategy

Repeat Buyers

- Differences-in-differences (DID)

(Transaction Characteristic (X_{it}) + Buyer Fixed Effect (μ_i) + Seller Fixed Effect (λ_s) + Category FE (γ_c) + Cluster SEs)

$$y_i = \beta_1 \text{Post}_i + \beta_2^{M_i} (\text{Treat}_{M_i} \cdot \text{Post}_i) + \beta_3 X_i^T + \mu_{b_i} + \lambda_{s_i} + \epsilon_i$$

$$Y_{it} = \begin{cases} 1, & \text{tip} \\ 0, & \text{otherwise} \end{cases}$$

$$\text{Treat}_i^M = \begin{cases} 1, & \text{if buyer is under treatment M} \\ 0, & \text{otherwise} \end{cases}$$

$$M \in \{Norm, Reciprocity, Appreciation\}$$

$$\text{Post}_t = \begin{cases} 1, & \text{test period} \\ 0, & \text{otherwise} \end{cases}$$

Result

Repeat Buyers

	Pool (1)	First (2)	Second (3)	Third (4)
Implicit_Reliability:Post	−0.001 (0.002)	0.003 (0.004)	−0.006 (0.004)	−0.006 (0.005)
Reciprocity:Post	0.002 (0.002)	0.006 (0.004)	0.002 (0.004)	−0.004 (0.005)
Norms:Post	0.005** (0.002)	0.020*** (0.004)	0.005 (0.004)	−0.005 (0.005)
Post	−0.0004 (0.002)	0.002 (0.003)	0.002 (0.003)	0.0003 (0.004)
Category FE	Y	Y	Y	Y
Buyer FE	Y	Y	Y	Y
Transaction Char.	Y	Y	Y	Y
Seller FE	Y	Y	Y	Y
Observations	760,135	638,196	581,651	464,295
Number of Buyers	40,823	40,823	34,871	22,226
R ²	0.544	0.562	0.562	0.569
Adjusted R ²	0.453	0.462	0.461	0.469

Note:

p<0.05; *p<0.01

Treatment Effect on Repeat Transaction

Repeat Buyers

$$y_i = \beta_1 \text{Post}_i + \sum_{g=1}^3 \beta_2^{M_g} (\text{Treat}_{M_g} \cdot \text{Post}_i) + \beta_3 X_i^T + \mu_{b_i} + \lambda_{s_i} + \epsilon_i$$

- Estimate treatment effects on repeat buyers' revisit during the sample period separately
 1. Second Order Exists with new buyers' **first** transactions

$$Y_i = \begin{cases} 1, & \text{a repeat buyer completed a second transaction during the sample period} \\ 0, & \text{otherwise} \end{cases}$$

2. Third Order Exists with new buyers' **second** transactions

$$Y_i = \begin{cases} 1, & \text{a repeat buyer completed a third transaction during the sample period} \\ 0, & \text{otherwise} \end{cases}$$

- X_i^T :transaction characteristics, μ_{b_i} , λ_{s_i} : buyer, and seller fixed effects

Treatment Effect on Repeat Transaction

	Second Order Exists	Third Order Exists
	(1)	(2)
Implicit_Reciprocity:Post	-0.001 (0.005)	-0.010 (0.007)
Reciprocity:Post	-0.001 (0.005)	-0.008 (0.007)
Norms:Post	0.005 (0.005)	0.007 (0.007)
Post	-0.142*** (0.003)	-0.334*** (0.005)
Category FE	Y	Y
Buyer FE	Y	Y
Seller FE	Y	Y
Observations	638,196	581,651
Number of Buyers	40,823	34,871
R ²	0.455	0.594
Adjusted R ²	0.330	0.500

Note:

** p<0.05; *** p<0.01

- Norms treatments led to slightly more repeat purchases on average but the effect was not statistically significant

Post-Experiment Platform Design Intervention

- Recall, 2 message treatments were confounded with default tips change
- Two post-test interventions separate messages from default tips

	Control	Implicit Reciprocity	Reciprocity	Norms
Test Period	Status Quo Message & Two Defaults + Custom Tip	Implicit Reciprocity Message & Two Defaults + Custom Tip	Reciprocity Message & Three Defaults + Custom Tip	Norms Message & Three Defaults + Custom Tip
Post-test Period I (3 weeks)				
Post-test Period II				

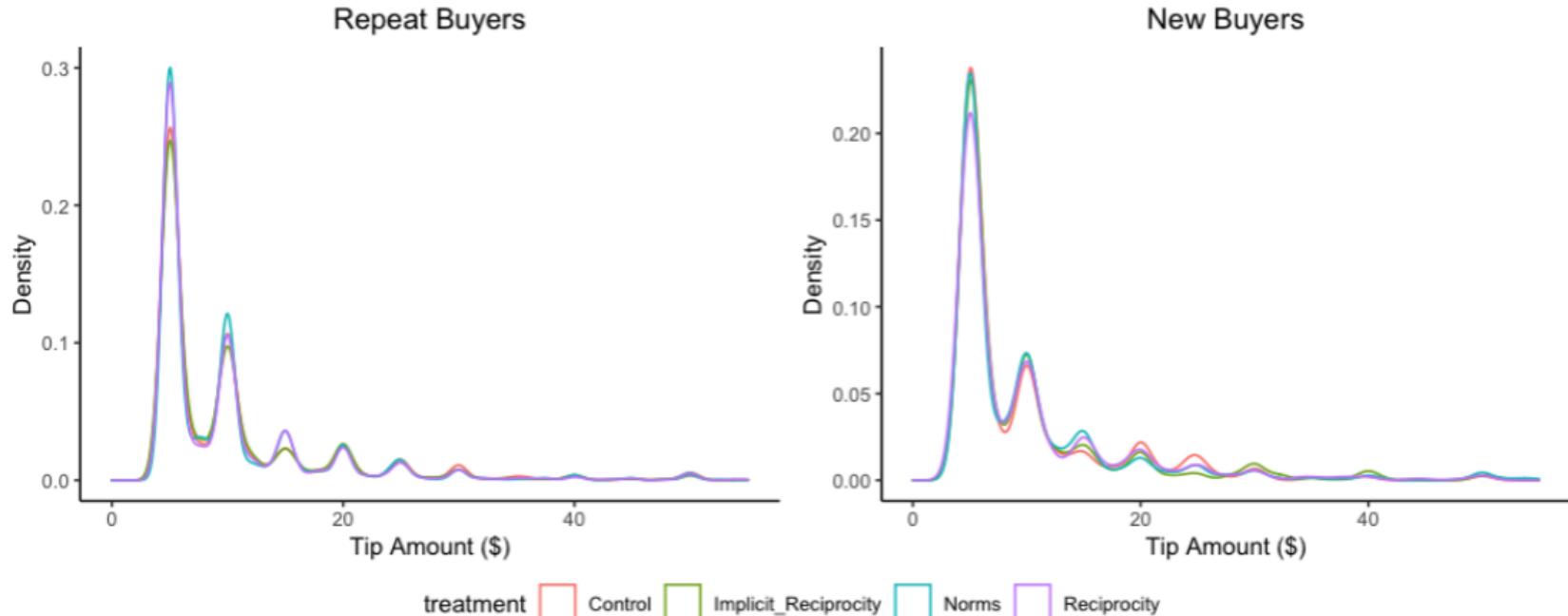
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Test Period	Status Quo Message & Two Defaults + Custom Tip	Implicit Reciprocity Message & Two Defaults + Custom Tip	Reciprocity Message & Three Defaults + Custom Tip	Norms Message & Three Defaults + Custom Tip
Post-test Period I (3 weeks)			Status Quo Message & Three Defaults + Custom Tip	
Post-test Period II				

- $y_i = \beta_1 \text{Post_Test}_i + \beta_2^{M_i} (\text{Treat}_{M_i} \cdot \text{Post_Test}_i) + \alpha_1 X_i^T + \mu_{b_i} + \lambda_{s_i} + \epsilon_i$
 - ▶ β_1 : Causal effect of the 3-option default tips
 - ▶ $\beta_2^{\text{Norm}}, \beta_2^{\text{Reciprocity}}$: Causal effect of removing Norm and Reciprocity messages

Nonzero Tips by Treatment Group



Post-Experiment Platform Design Intervention

$$y_i = \beta_1 \text{Post_Test}_i + \beta_2^{M_i} (\text{Treat}_{M_i} \cdot \text{Post_Test}_i) + \alpha_1 X_i^T + \mu_{b_i} + \lambda_{s_i} + \epsilon_i$$

	New Buyers (1)	Repeat Buyers (2)
Implicit.Reciprocity:Post_Test	-0.012 (0.016)	-0.001 (0.003)
Reciprocity:Post_Test	-0.051*** (0.017)	-0.004 (0.003)
Norms:Post_Test	-0.039** (0.017)	-0.003 (0.003)
Post_Test	0.024** (0.012)	-0.002 (0.002)
Category FE	Y	Y
Buyer FE	Y	Y
Seller FE	Y	Y
Observations	19,676	221,352
Number of Buyers	2,946	26,850
R ²	0.791	0.667
Adjusted R ²	0.447	0.501

Note:

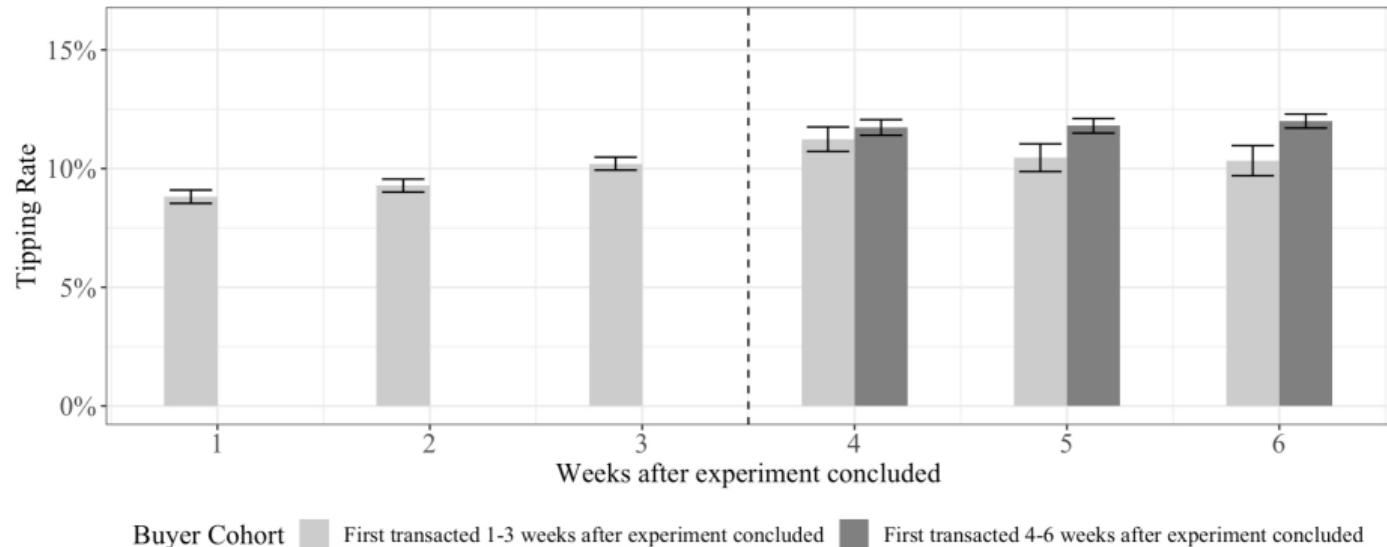
p<0.05; *p<0.01

Post-Experiment Platform Design Intervention

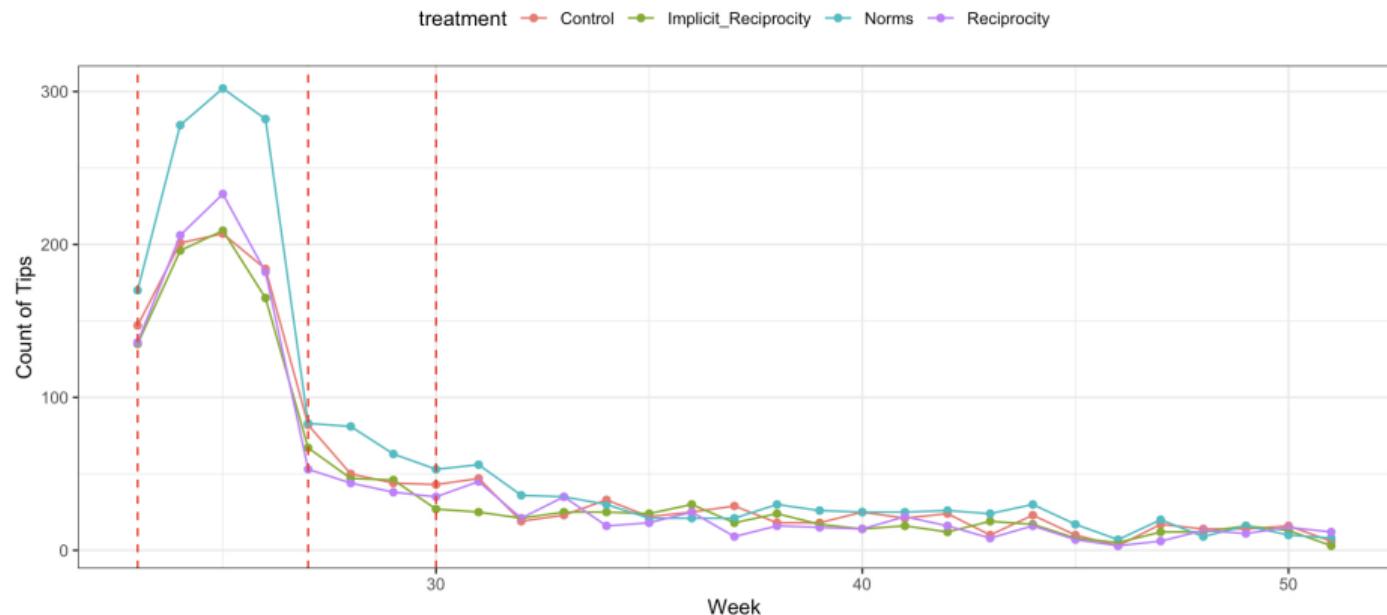
	Control	Implicit Reciprocity	Reciprocity	Norms
Test Period	Status Quo Message & Two Defaults + Custom Tip	Implicit Reciprocity Message & Two Defaults + Custom Tip	Reciprocity Message & Three Defaults + Custom Tip	Norms Message & Three Defaults + Custom Tip
Post-test Period I (3 weeks)	Status Quo Message & Three Defaults + Custom Tip			
Post-test Period II	Norm Message & Three Defaults + Custom Tip			

- Compare weekly tipping rates between two cohorts
 - ▶ Cohort I- New buyers during Post-test period I
 - ▶ Cohort II - New buyers during Post-test period II

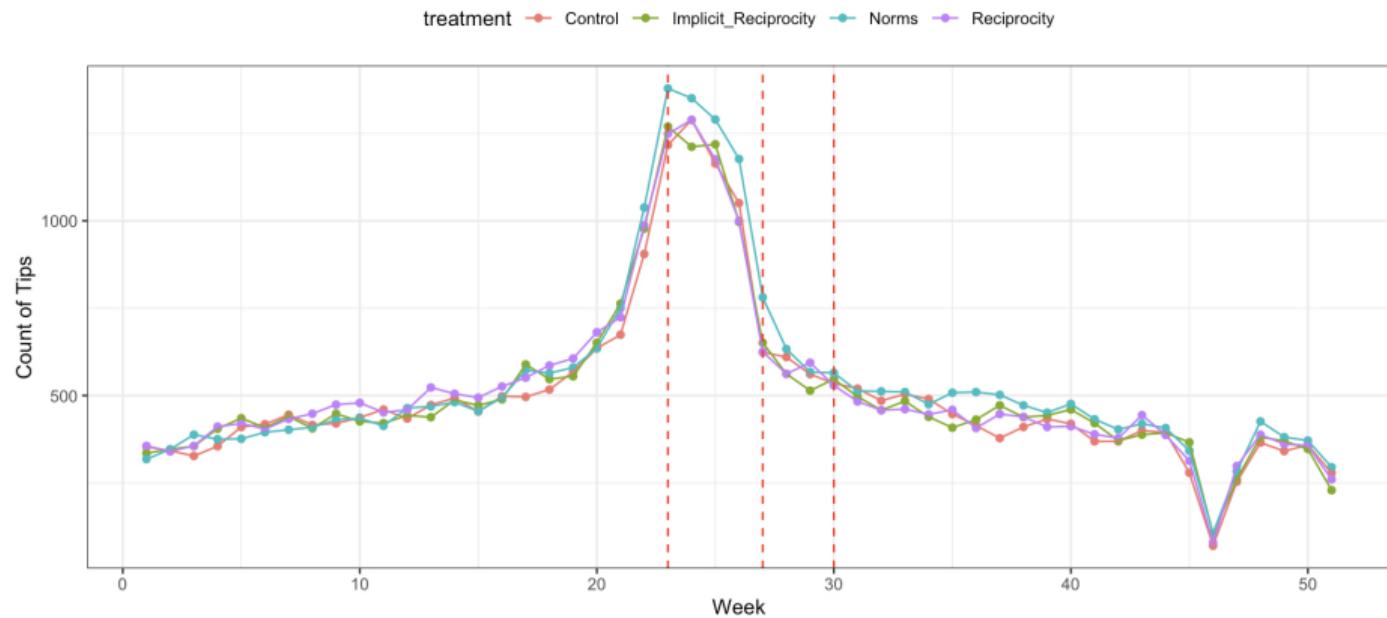
Post-Experiment Platform Design Intervention



New Buyers: Tips over a longer horizon



Repeat Buyers: Tips over a longer horizon



Longer-Term Buyer Analyses

- We regress buyer (Transactions, Ratings, 5-star ratings, Spend, Tips, Tip Spending) on (buyer effects, seller effects, week effects, treatment * period interactions) for new buyers and repeat buyers
- We find no significant differences between treatment groups outside the test period
- Hence we do not find long-term effects of injunctive norm on any buyer behaviors

What about seller behaviors?

- Define “indirect treatment” as each seller’s first indirect exposure to buyer treatment condition
- When we distinguish sellers by indirect treatment groups, we find no significant differences
 - ▶ Non-findings also hold for new sellers, and for sellers who first transacted with new buyers
 - ▶ But, buyer treatments were unobserved by sellers, and treatments did not induce many incremental tips
- We are using treatment dummies to instrument for endogenous tipping effects on subsequent seller behaviors, including (gigs, price, ratings, tips, tip mentions)
 - ▶ Results to date don’t indicate any significant effects

What predicts injunctive norm compliance?

- We pool pre-test and test data with all buyers

(Transaction Characteristic (X_{it}) + Frequent Buyer Fixed Effect (α_{b_i}) + Seller Fixed Effect (λ_s) + Cluster SEs)

$$y_i = \beta_0^{M_i} (\text{New}_i \cdot \text{Treat}_{M_i} \cdot \text{Post}_i) + \beta_1^{M_i} (\text{New}_i \cdot \text{Treat}_{M_i} \cdot \text{Post}_i \cdot X_i^{\{B,T,S\}}) + \\ \beta_2^{M_i} (\text{Treat}_{M_i} \cdot \text{Post}_i) + \beta_3^{M_i} (\text{Treat}_{M_i} \cdot \text{Post}_i \cdot X_i^{\{B,T,S\}}) + \\ \beta_4 X_i^T + \alpha_{b_i} + \lambda_{s_i} + \gamma_{c_i} + \epsilon_i$$

New_i indicates buyer b_i 1st transacted during the test period

Treat_i^M indicates buyer treatment $M_i \in \{\text{Norm}, \text{Reciprocity}, \text{Appreciation}\}$

Post_i indicates transaction occurred during test period

α_{b_i} defined for buyers with 4+ transactions

What predicts injunctive norm compliance?

	New Buyers	Repeat Buyers
Norms:Post	-0.0443***	-0.0048
*Buyer Prior Orders	0.0040**	0.0000
*Buyer Prior Ratings	-0.0050**	-0.0000
*Buyer Average Rating	-0.0011	-0.0013
*Buyer Tenure		-0.0001**
*User-defined Female	-0.0453	-0.0025
*User-defined Male	-0.0045	0.0005
*North_America	0.0393***	0.0154***
*Buyer-Seller Repeat Indicator	0.0146	-0.0023
*Count of Buyer-Seller Repeat Orders	-0.0058	0.0000
*3stars	-0.0042	0.0090
*4stars	0.0150	0.0028
*5stars	0.0403***	0.0043
*Price	0.0001**	0.0000
*Seller Tip Mention	-0.0275	0.0032
*Seller Prior Orders	-0.0003**	0.0000
*Seller Prior Ratings	0.0004**	-0.0000
*Seller Average Rating	0.0000	0.0009
Observations	332,734	

Note:

p<0.05; *p<0.01

Takeaways

1. Can platforms appeal to specific tipping motivations to increase tipping?

- ▶ Yes, injunctive Norm message increased tipping among new buyers upon first exposure, without reducing demand
- ▶ Smaller first-exposure effect on repeat buyers
- ▶ Limited evidence of long-term behavior changes
- ▶ Reciprocity messages did not change behavior

2. How can platforms measure tip request effects on tips, orders, ratings, spending, etc: new vs repeat buyers, SR vs LR, buyers vs sellers?

- ▶ Manipulate attributes independently, consider buyer experience, multiple behaviors
- ▶ Estimate effects on sellers via indirect treatments or instrumental variables
- ▶ Even with population data, noise and estimation error remains considerable

3. What buyer and seller factors moderate tipping norm compliance?

- ▶ North American buyers, new buyer satisfaction
- ▶ Still working on this one

If time

- Implications
 - ▶ More platforms should test tipping motivation effects on tipping
 - ▶ Test carefully to understand full spectrum of responses
- Limitations
 - ▶ Service/esteem and altruism tipping motivations remain untested
 - ▶ Optimal phrasing likely remains untested
- What can we do better; what else should we do?
 - ▶ Develop the theoretical framework? How?
 - ▶ A structural model? How so, for what purpose?
 - ▶ Test a fuller spectrum of treatment messages in online experiments?
 - ▶ Suggestions solicited

Thank you!