Designing Inclusive Platforms

Abhay Aneja [1]   Michael Luca [2] Oren Reshef [3]

[1]University of California, Berkeley

[2]Harvard Business School

[3]Washington University in St. Louis

April 2022

Online platforms have come to play a central role in the economy, helping to facilitate a large share of economic activity.

Review Platforms

Online Marketplaces

Level of Anonymity

- A core question platform designers face is what information to reveal regarding platform participants?

Level of Anonymity

- A core question platform designers face is what information to reveal regarding platform participants?

"On the Internet, nobody knows you're a dog."

1. Early platforms: Arms length transactions
   - eBay, Amazon, Priceline
   - Digitization reduces discrimination (Morton and Zettelmeyer 2003)

2. Shifts towards less anonymity
   - *"Online anonymity has to go away"* Facebook marketing director, 2010
   - *"When you remove anonymity, it brings out the best in people"* Airbnb CEO Brian Chesky, 2013

"Remember when, on the Internet, nobody knew who you were?"

Negative Effects of Reducing Anonymity

- Recently, evidence of discrimination in online marketplaces
  - Airbnb - Edelman, Luca, and Svirsky (2017); Cui, Li, Zhang (2019)
  - eBay - Ayres, Banaji, and Jolls (2015); Von Essen and Karlsson (2019)
- Echoes a larger literature of blinding and discrimination
  - Goldin and Rouse (2000), Bertrand and Mullainathan (2004), Agan and Starr (2018)
3. Movement towards increasing anonymity
  - Airbnb (2018) - hiding guests' photos
  - Airbnb Oregon (2022) - hiding guests' names

This Paper

- Focus on the introduction of a "Black-owned Business" feature on Yelp.
  - Allowed consumers to search for black-owned businesses near them.
- Study the demand for black-owned restaurants after introduction.
- Use internal Yelp data: clicks on the business, calls, orders via the platform, etc.
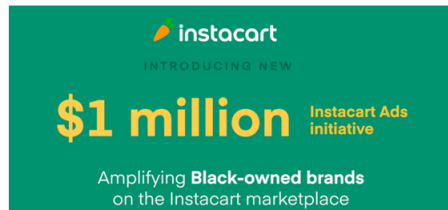- Heterogeneity across geographies, the racial composition of reviewers, and business attributes.

Research questions

1. Can increasing salience of race increase demand for businesses owned by racial minorities?

2. Can platform design changes leverage consumer demand to help marginalized groups?

- Revealing minority ownership improves performance on the platform.
 - Effect mostly driven by white liberals

Related Literature

- Platform design and governance
  - Boudreau and Hagiu (2009), Dinerstein et al. (2018), Parker and Van Alstyne (2018), Cusumano, Gawer, and Yoffe (2019)

- Discrimination and salience of race
  - Benjamin et al. (2010), Doleac and Stein (2013), Edelman, Luca, and Svirsky (2017), Agan and Starr (208)

- Minority-owned businesses and entrepreneurship
  - Blanchflower and Zimmerman (2003), Fairlie and Robb (2007), Chatterji and Seamens (2012), Failie et al. (2021)

Background and Setting

- Yelp, founded 2004, provides user-generated ratings for local businesses.
  - Covers a range of sectors: restaurants and hotels to plumbers and locksmiths.
- Currently, more than 200 million reviews and almost 200 million unique monthly visits.

Background and Setting

- In June 2020, Yelp launched a tool (feature) allowing users to search for black-owned businesses.
  - Women-owned (Jan 2020), Latinx-owned (Aug 2020), and Asian-owned (Apr 2021)
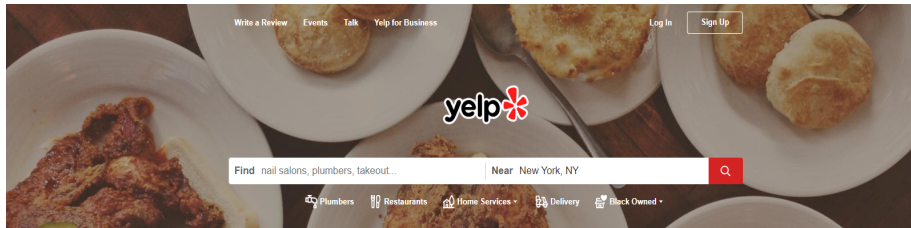
- Users can find BOBs by applying the filter or by typing the relevant keywords.

Background and Setting

- Businesses are marked as black-owned based on businesses opting in or users' reviews (at least two reviews).
  - Currently, no vetting process.

Adoption of the Feature

Data

- Proprietary Yelp data from seven markets: San Francisco, Los Angeles, New York, Minneapolis, Atlanta, Chicago, and Houston
- April 2019 through September 2021
- Outcomes:
  - ▶ Page views, website visits, calls
  - ▶ Orders through platform, revenue from orders
- The unit of observation is business-week.
- Additional datasets:
  - ▶ NETS
  - ▶ ACS
  - ▶ Voting data
  - ▶ Scraped photos and facial recognition

Research Design

- Coarsened exact matching (CEM) by:
    - rating
    - cuisine
    - zip code
    - chain status

- Final sample includes 28,412 businesses (1,694 black-owned).

- (Weighted) Difference-in-Differences research design.

- Business and week fixed effects, clustered at the business-level.

- Robustness: focus on businesses that opted in from the beginning, focus only on black-owned businesses, linear time trends, etc.

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
Panel A: All Black-owned Businesses					
Post X Black	27.642***	2.869***	1.874***	0.706***	22.060***
	(4.859)	(0.408)	(0.204)	(0.131)	(4.105)
Panel B: Claimed Black-owned Businesses					
Post X Black	51.718***	4.927***	2.067***	0.958***	28.859***
	(8.991)	(0.783)	(0.295)	(0.231)	(7.907)
Panel C: Reviewed as Black-owned Businesses					
Post X Black	26.403***	2.937***	2.083***	0.672***	20.171***
	(6.044)	(0.506)	(0.253)	(0.144)	(4.333)
Observations	3190188	3190188	3190188	775478	775478
# of Clusters	27934	27934	27934	6456	6456
Dep Var. Mean	77.00	5.56	2.64	2.08	61.30

Results
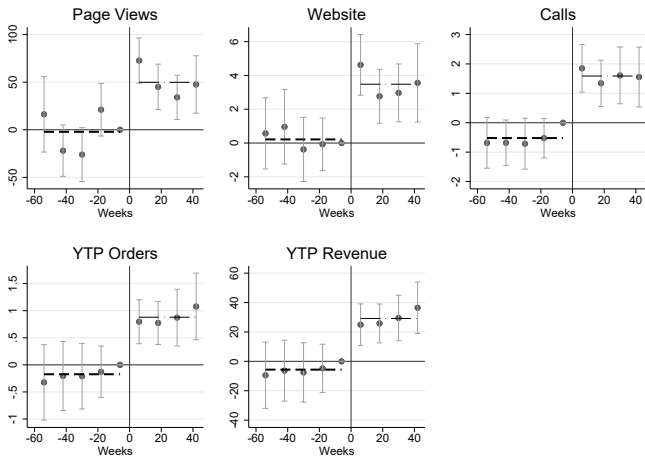
Empirical Concerns

1. Selection into treatment:
   - Reviewed as black
   - Non-staggered DiD
   - Staggered DiD correction (need to do)

2. Correct counterfactual:
   - CEM
   - Only black businesses

3. National trends:
   - Linear time trends
   - Only late adopters

Robustness Tests

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
			Panel A: Asinh Outcomes		
Post X Black	0.562***	0.308***	0.274***	0.146***	0.305***
	(0.025)	(0.023)	(0.016)	(0.026)	(0.063)
			Panel B: Linear Time Trend		
Post X Black	76.605***	1.837***	1.145***	0.459***	16.303***
	(8.178)	(0.367)	(0.207)	(0.145)	(4.709)
			Panel C: Non-Staggered Diff-in-Diff		
Post × Black	28.184***	2.771***	1.848***	0.580***	18.253***
	(4.726)	(0.400)	(0.207)	(0.136)	(4.246)
Observations	3190188	3190188	3190188	775478	775478
# of Clusters	27934	27934	27934	6456	6456
Dep Var. Mean	77.00	5.56	2.64	2.08	61.30
			Panel D: Only Late Adopters		
Post X Black	29.261***	2.051***	1.123***	0.725***	24.062***
	(5.067)	(0.519)	(0.187)	(0.153)	(5.531)
Observations	3088422	3088422	3088422	716631	716631
# of Clusters	27167	27167	27167	6020	6020
Dep Var. Mean	72.03	5.26	2.48	2.08	61.13

Using Only Black-Owned Businesses Controls

	(1) Page Views	(2) Calls	(3) Website	(4) YTP Orders	(5) YTP Revenue
Panel A: Using Black-Owned Busiensses on Yelp as Controls					
Post X MOB	35.314***	2.204***	2.860***	0.869***	28.967***
	(8.535)	(0.296)	(0.518)	(0.179)	(6.347)
Observations	186393	186393	186393	108339	108339
# of Clusters	1694	1694	1694	924	924
Dep Var. Mean	195.14	6.13	12.89	1.81	55.53
Panel B: Using Black-Owned Busiensses on NETS as Controls					
Post X MOB	28.296***	1.943***	2.838***	0.963*	20.466
	(6.770)	(0.322)	(0.441)	(0.514)	(12.723)
Observations	209008	209008	209008	113227	113227
# of Clusters	1868	1868	1868	959	959
Dep Var. Mean	180.71	5.87	11.79	1.89	57.06

Mechanisms and Heterogeneity

Who responds to the BOB feature?

- Characteristics of area:
  - Demographics
  - Political attitudes
- Reviewer characteristics:
  - Race of reviewer
  - Homophily vs. allyship
- Business characteristics:
  - Which attributes moderat the effect?
  - Which type of businesses opt in?

Political Attitudes

- Within US, political divide on views on race and discrimination
- E.g. support for Black Lives Matter movement

Among White adults

Rep/Lean Rep	2	14	**16**
Dem/Lean Dem	51	36	**88**

September 2020 Pew survey

Political Attitudes

- Within US, political divide on views on race and discrimination
- E.g. support for Black Lives Matter movement

Among White adults

Rep/Lean Rep 2 14   16

Dem/Lean Dem 51 36   88

September 2020 Pew survey
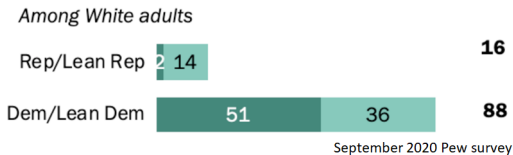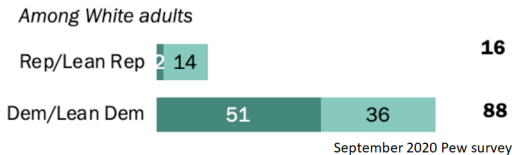
- Merge in voter data at the county- and city-level (spatial matching using precinct data).
  - ▶ Caveat: the vast majority of counties and cities in our sample are left-leaning.
- Interact the main effect with political leaning.

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
	Panel A: Majority Democrats (By County)				
Post X Black	5.893	-1.114	-0.173	-0.269	-10.891*
	(13.636)	(1.529)	(0.506)	(0.165)	(6.177)
Post X Black × Majority Dem.	31.256**	5.394***	2.624***	1.410***	48.048***
	(15.641)	(1.690)	(0.589)	(0.234)	(8.582)
Observations	1744528	1744528	1744528	436733	436733
# of Clusters	15102	15102	15102	3608	3608
Number of Counties	39	39	39	9	9
Dep Var. Mean	100.71	7.00	3.75	2.76	83.62
	Panel B: Majority Democrats (By City)				
Post X Black	41.910***	3.374***	1.105***	0.210*	6.665
	(9.118)	(0.980)	(0.364)	(0.127)	(4.915)
Post X Black × Majority Dem.	-14.494	-0.426	0.835**	0.541***	16.699***
	(10.411)	(1.068)	(0.419)	(0.165)	(6.079)
Observations	3047460	3047460	3047460	744958	744958
# of Clusters	26624	26624	26624	6189	6189
Number of Cities	248	248	248	78	78
Dep Var. Mean	78.37	5.63	2.69	2.11	62.32

Homophily or Allyship?

- Homophily: Black customers who want to support black-owned businesses
  - Prediction: the effects are mostly driven by black costumers.
- Allyship: Non-black customers who want to support black-owned businesses
  - Prediction: the effects are mostly driven by non-black costumers.
- Tests:
  1. Neighborhood demographics.
  2. Racial composition of restaurant goers

Heterogeneity By Neighborhood Demographics

	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
Post X Black	36.663***	4.896***	3.230***	1.371***	47.175***
	(8.967)	(0.806)	(0.374)	(0.248)	(8.121)
Post X Black × Frac. Black	-23.436	-5.262***	-3.519***	-1.706***	-64.410***
	(16.806)	(1.217)	(0.579)	(0.384)	(12.510)
Observations	3188561	3188561	3188561	775478	775478
# of Clusters	27910	27910	27910	6456	6456
Dep Var. Mean	77.04	5.56	2.64	2.08	61.30

- Scraped photos of all reviewers in Atlanta
- Used DeepFace to infer race from pictures
  - Only reviews with identifiable face and race
- Final sample of 1,246 businesses (approx. 30%), 120 of which are black-owned

Heterogeneity By Reviewers Race

- Scraped photos of all reviewers in Atlanta
- Used DeepFace to infer race from pictures
  - Only reviews with identifiable face and race
- Final sample of 1,246 businesses (approx. 30%), 120 of which are black-owned

Table: Effect on Reviewers' Race (Georgia)

	(1) White Reviewer	(2) Non-Minority Reviewer	(3) Prob. White Reviewer
Post X Black	0.047***	0.042**	2.534**
	(0.017)	(0.020)	(1.142)
Observations	19670	19670	24470
# of Clusters	916	916	948
Dep Var. Mean	0.41	0.59	31.24

Heterogeneity By Business' Characteristics

Interaction of the main effect with firm (pre-feature) characteristics.

- No effect of time since establishment.
- Positive effects for: rating and pre-feature performance
  - Consumers are differentially choosing the best BOBs.
- Negative effect for chain dummy.
 - Reduced benefits for chains with black owners.

Table

Conclusion

- Making race of black business-owners salient can increase demand
  - Driven by ideology and allyship

- Targeted anonymity can help reduce racial bias...
- BUT there are also important social movements aimed at supporting historically marginalized groups
- Increasing salience of race in a targeted way has the potential to help marginalized groups
  - Platform design choices have big effects on inclusivity

Thank You

Results
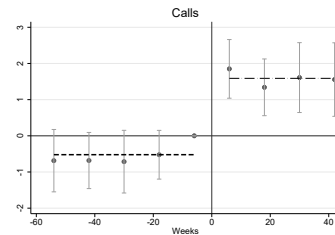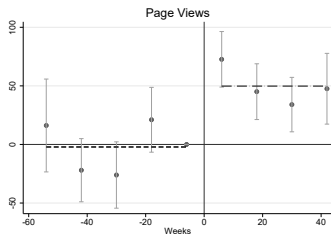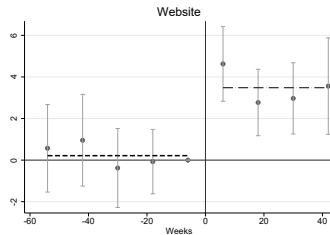
Back

Results

Back

Heterogeneity By Business' Characteristics

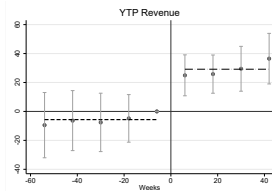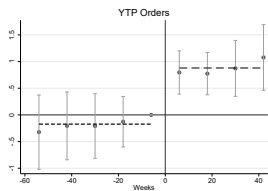|	(1) Page Views	(2) Website	(3) Calls	(4) YTP Orders	(5) YTP Revenue
Panel A: Rating (Continuous)					
Post X Black	-106.861***	-10.155***	-3.455***	-1.863***	-51.109***
	(24.803)	(2.066)	(0.990)	(0.604)	(17.644)
Post X Black × Ratings	34.434***	3.340***	1.328***	0.656***	18.679***
	(6.808)	(0.573)	(0.272)	(0.171)	(4.892)
Observations	1488725	1488725	1488725	710150	710150
# of Clusters	11174	11174	11174	5266	5266
Panel B: Rating (Dummy)					
Post X Black	5.497	0.811*	1.010***	0.452***	16.391***
	(5.686)	(0.448)	(0.245)	(0.148)	(5.370)
Post X Black × Ratings	45.083***	4.238***	1.471***	0.486**	10.687
	(10.413)	(0.881)	(0.435)	(0.238)	(7.698)
Observations	1488725	1488725	1488725	710150	710150
# of Clusters	11174	11174	11174	5266	5266
Panel C: Performance Pre-feature (Five Outcomes Index)					
Post X Black	21.266***	0.832*	-0.133	0.382***	8.846***
	(6.469)	(0.485)	(0.249)	(0.114)	(3.280)
Post X Black × Index	8.176	1.481***	1.089***	0.196***	8.109***
	(5.725)	(0.381)	(0.217)	(0.074)	(2.530)
Observations	737397	737397	737397	737397	737397
# of Clusters	5505	5505	5505	5505	5505
Panel D: Performance Pre-feature (Three Outcomes Index)					
Post X Black	21.943***	1.466**	0.542*	0.376***	8.558**
	(5.714)	(0.645)	(0.308)	(0.128)	(3.873)
Post X Black × Index	4.182	0.986*	0.918***	0.180**	7.452***
	(5.584)	(0.575)	(0.281)	(0.078)	(2.703)
Observations	3065005	3065005	3065005	737397	737397
# of Clusters	24238	24238	24238	5505	5505
Panel E: Franchisee					
Post X Black	27.908***	2.942***	1.920***	0.722***	22.692***
	(4.948)	(0.415)	(0.208)	(0.133)	(4.157)
Post X Black × Franchisee	-13.285	-3.680***	-2.268***	-0.795	-30.879*
	(11.794)	(1.402)	(0.353)	(0.657)	(16.980)
Observations	3190188	3190188	3190188	775478	775478
# of Clusters	27934	27934	27934	6456	6456

Back