

Racial Discrimination and Housing Outcomes in the United States Rental Market

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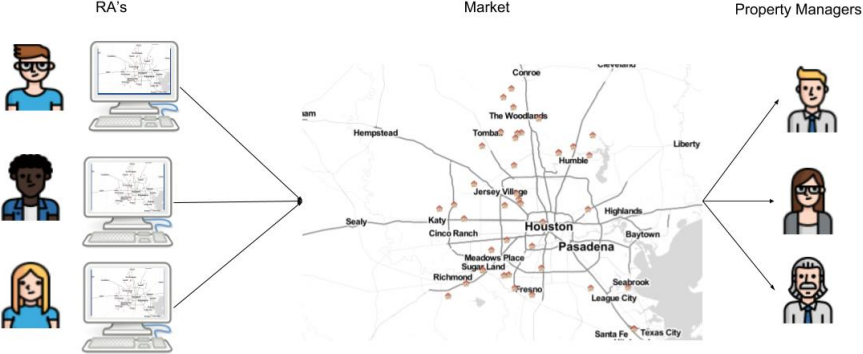
Motivation

- Recent research has shown that the neighborhood where people live has important implications for short-run, long-run and even intergenerational outcomes. (Akbar et al., 2019, Chetty et al., 2018, Currie, 2011, Currie and Neidell, 2005)
- Observational data make it difficult to disentangle the multiple factors that explain residential location choice.
 - ▶ Disparities in income, differences in information about neighborhood attributes (Banzhaf et al., 2019, Aliprantis et al., 2019, Logan, 2011)
 - ▶ Housing/neighborhood preferences that also affect residential sorting behavior (Depro et al., 2015, Banzhaf and Walsh, 2013)
 - ▶ Racial discrimination (Ewens et al., 2014, Carlsson and Eriksson, 2014, Hanson and Hawley, 2011, Ahmed and Hammarstedt, 2008, Christensen and Timmins, 2022, Christensen et al., 2022)

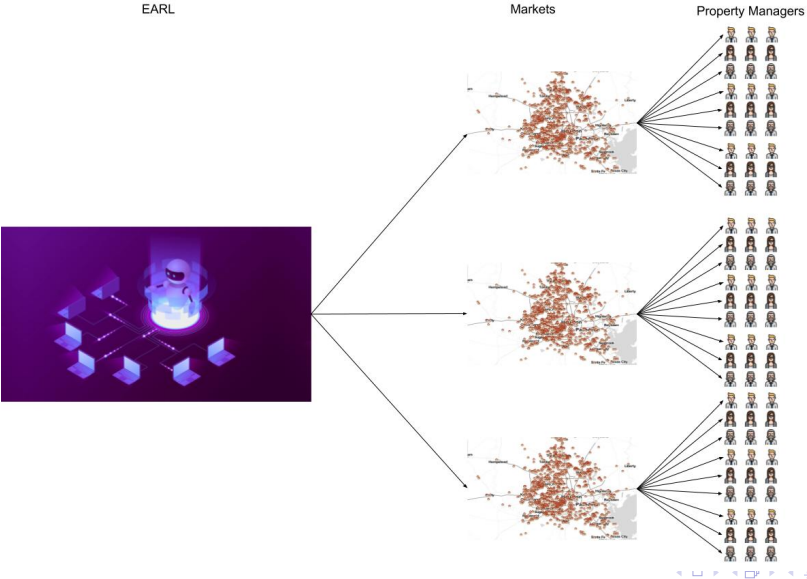
Contributions

- We contribute to two strands of the economics literature on racial discrimination and inequality in U.S. cities
 - ① Measurement of discrimination in housing markets ([Ewens et al., 2014](#), [Hanson and Hawley, 2011](#), [Ahmed et al., 2013, 2010](#), [Ahmed and Hammarstedt, 2008, 2009](#))
 - ★ This study provides the largest correspondence study in the US rental market discrimination to date, enabling statistically powered analysis at neighborhood (census tract) or city scales
 - ★ Response rates will be made publicly available at tract-level for further use by researchers
 - ★ Sampling design (parallel random draws) designed to allow comparability across 50 largest U.S. housing markets
 - ② The nascent literature on the relationship between discrimination, segregation, and housing outcomes ([Christensen et al., 2022](#), [Christensen and Timmins, 2021](#), [Li, 2019](#), [Shertzer and Walsh, 2019](#), [Boustan, 2012, 2010](#), [Card et al., 2008](#), [Chetty et al., 2018](#)).

Traditional Way: Correspondence



What we do: Distributed Processing



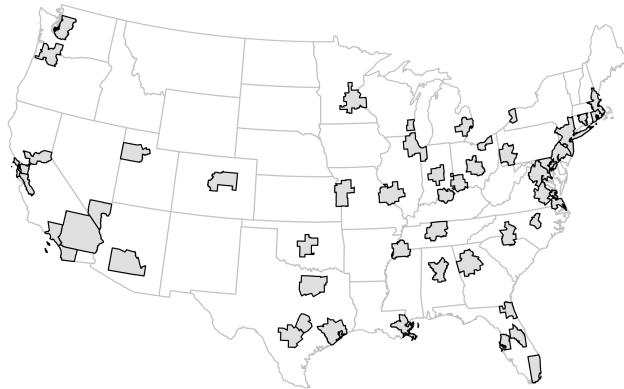
Experimental Design

Sample of Markets

- 50 Largest CBSA's (\sim 50% of US population)

Experimental Design

Figure: CBSA's in Experiment



Experimental Design

Sample of Markets

- 50 Largest CBSA's (~ 50% of US population)
- First day a listing is active we send an inquiry
 - ▶ Scrape all listing characteristics
 - ▶ Randomly assign one of 18 names that are associated with racialized perceptions of African American, Hispanic/LatinX, and white social groups in US ([Gaddis, 2017](#), [2018](#))

Experimental Design

Panel A. Identification Rates from Gaddis (2017a,b) (%)				
Race	First Name	No Last Name	Last Name Included	Quartile mother's education
African American	Nia	41	65	High
African American	Jalen	63	71	High
African American	Ebony	91	95	Med
African American	Lamar	88	94	Med
African American	Shanice	93	92	Low
African American	DaQuan	91	96	Low
Hispanic/LatinX	Isabella	48	98	High
Hispanic/LatinX	Jorge	86	98	High
Hispanic/LatinX	Mariana	78	99	Med
Hispanic/LatinX	Pedro	98	99	Med
Hispanic/LatinX	Jimena	49	97	Low
Hispanic/LatinX	Luis	83	99	Low
White	Aubrey	90	93	High
White	Caleb	77	84	High
White	Erica	82	93	Med
White	Charlie	86	91	Med
White	Leslie	72	93	Low
White	Ronnie	71	89	Low

Experimental Design

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 - ▶ 3 male/female, 1 high/medium/low maternal educational attainment
 - ▶ continue for the following 2 days with the remaining races

Experimental Design: Form-filled Inquiries

Contact This Property

Property Manager

~~(855) 878-8785~~

Name

Phone

Email

Message

I am interested in this rental and
would like to schedule a viewing.

Experimental Design

Sample of Markets

- 50 Largest CBSA's (~ 50% of US population)
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 - ▶ 3 male/female, 1 high/medium/low maternal educational attainment
 - ▶ continue for the following 2 days with the remaining races
- Record Responses (1 if responded with availability), 0 o.w.
 - ▶ email
 - ▶ phone
 - ▶ text sms
- Final sample: ~ 25,000 inquiries (~ 8,300 properties)

Estimation

- The experimental design involves a sequence of binomial decisions ($j = 1, 2, 3$), where a property manager of a given listing i decides whether
 - ▶ to make property available ($Response_{ij} = 1$)
 - ▶ or not ($Response_{ij} = 0$).
- The magnitude of discriminatory constraints are estimated using a within-listing linear probability model:

$$Response_{ij} = \beta_A African\ American_j + \beta_L Hispanic / Latin X_j + \theta X_j + \delta_i + \epsilon_{ij} \quad (1)$$

- ▶ $African\ American_j$ and $Hispanic / Latin X_j$ are indicator variables for the respective race/ethnicity.
- ▶ X_j is a vector of identity-specific control variables: gender, education level, and the order in which the inquiry was sent.
- ▶ δ_i is the listing fixed effect

Estimation

- We then calculate the Relative Response Rates

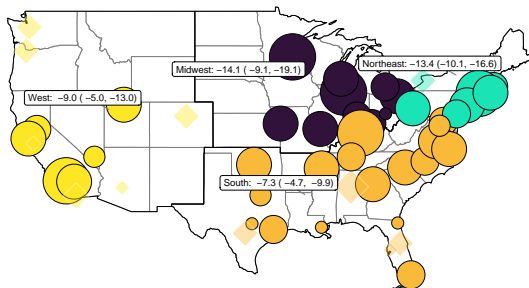
$$RR_A = \frac{P(\text{Response} | \text{AfAm} = 1)}{P(\text{Response} | W = 1)} = \frac{\beta_A}{\mu_W} \quad (2)$$

$$RR_L = \frac{P(\text{Response} | \text{LatinX} = 1)}{P(\text{Response} | W = 1)} = \frac{\beta_L}{\mu_W} \quad (3)$$

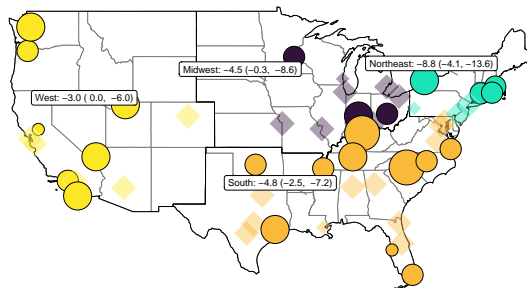
- where β_A and β_L are the coefficients from the previous regression
- μ_W is the average response for whites.
- We report Empirical Bayes shrunken posterior means ([Armstrong et al., 2022](#)) procedure.

The Geography of Discriminatory Behavior in the US

African American

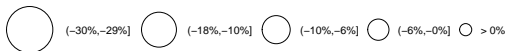


Hispanic/LatinX



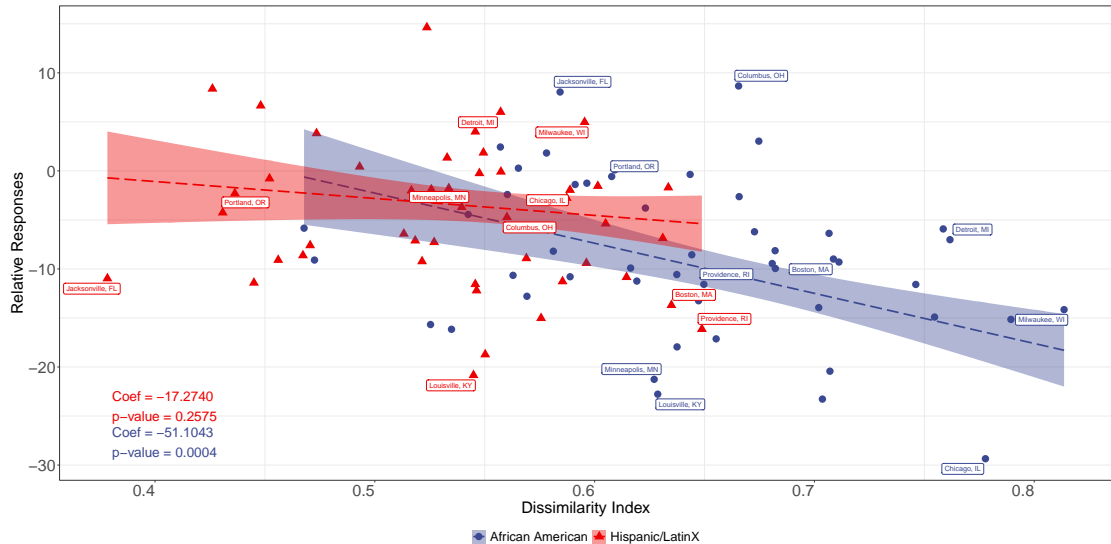
Region ● Midwest ● Northeast ● South ● West

Response Rates
(Relative to White Identities)

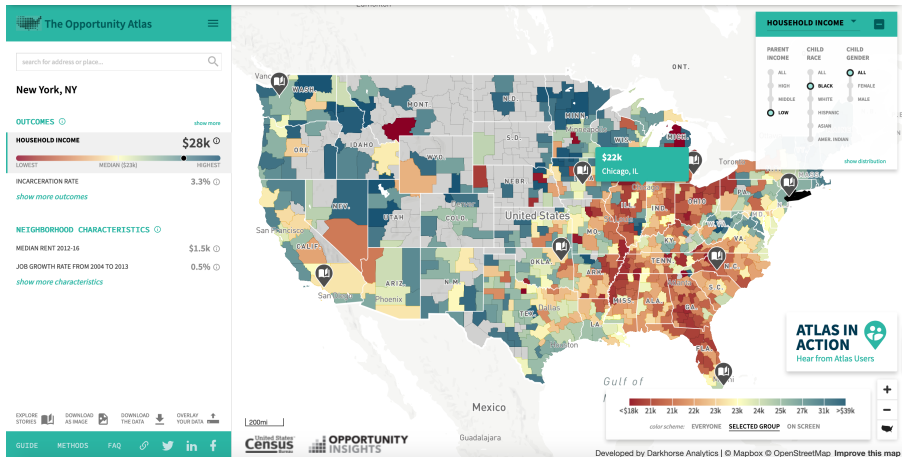


Statistically Significant Not Significant

Discriminatory Behavior and Segregation

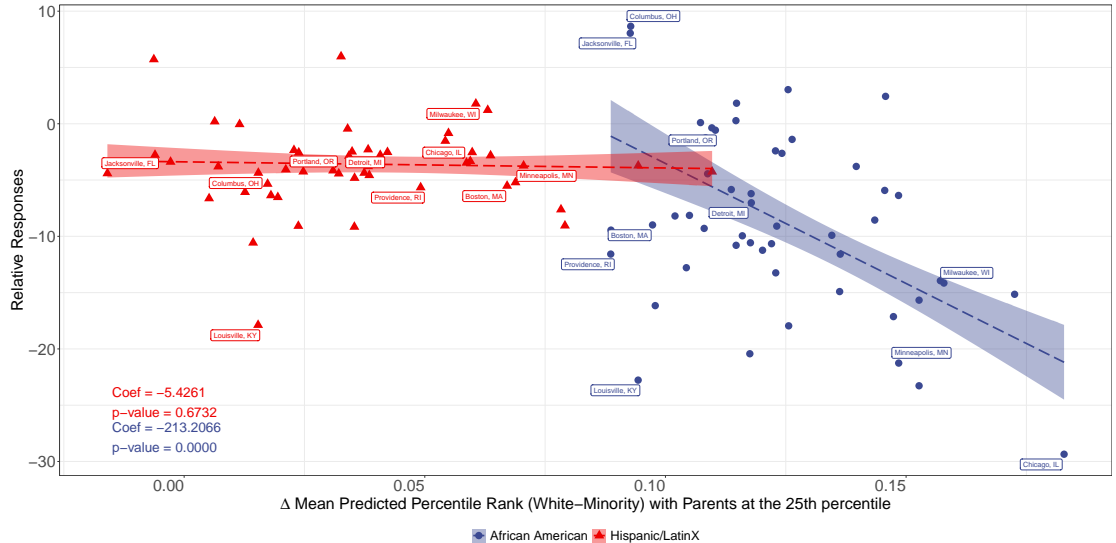


Discriminatory Behavior and the Income Mobility Gap



Source: <https://www.opportunityatlas.org/>

Discriminatory Behavior and the Income Mobility Gap



Discriminatory Behavior and Housing Outcomes

- A key limitation of the correspondence method is that the researcher never directly observes the effects of constraints faced by fictitious applicants on actual housing outcomes (Heckman, 1998).
- Recently-available data on renter housing location choices provide an opportunity to link the listed rental properties sampled for the experiment to the racial/ethnic identities of households that subsequently rented them in 2020
 - ▶ InfoUSA's consumer database tracks 120 million households and 292 million individuals between 2006-2019, and is maintained using 29 billion records from 100 sources including census statistics, billing statements, telephone directory listings and mail order buyers/magazine subscriptions.
 - ▶ Household-level identifiers provide information on the gender, race/ethnicity, age, address, renter/owner status and estimated household income of renters.
- Of the sample of properties in the correspondence experiment, 12% are ultimately rented by African American households, 11% by LatinX renters, 71% by white households, and the remaining 6% by households from other groups.

Discriminatory Behavior and Housing Outcomes

Tests of Differential Treatment and Housing Outcomes

- We estimate the following a series of within-listing linear probability models

$$\textit{Same Race}_{ij} = \beta_R \textit{Response}_j + \alpha + \theta X_j + \delta_i + \epsilon_{ij} \quad (4)$$

- ▶ *Same Race*_{ij} (*SR*) takes a value of one if the race/ethnicity of the renter observed to inhabit the property matches the race/ethnicity of experimental identity that sent the inquiry *j* to listing *i*; and zero otherwise.
- ▶ *Response*_{*j*} is an indicator that takes a value of one if the identity received a response.
- ▶ *X*_{*j*} is a vector of identity-specific control variables: gender, education level, and the order in which the inquiry was sent.
- ▶ δ_i is a listing-specific fixed effect that controls for any within listing time-invariant characteristics.

Discriminatory Behavior and Housing Outcomes

Tests of Differential Treatment and Housing Outcomes

- Using all groups and the full sample, we estimate the relative probability that the racial/ethnic identity of the renter that inhabits the property is the same as the identity that sends the inquiry:
- We use coefficients from Eq. 4 to compare these probabilities under the two experimental response conditions.

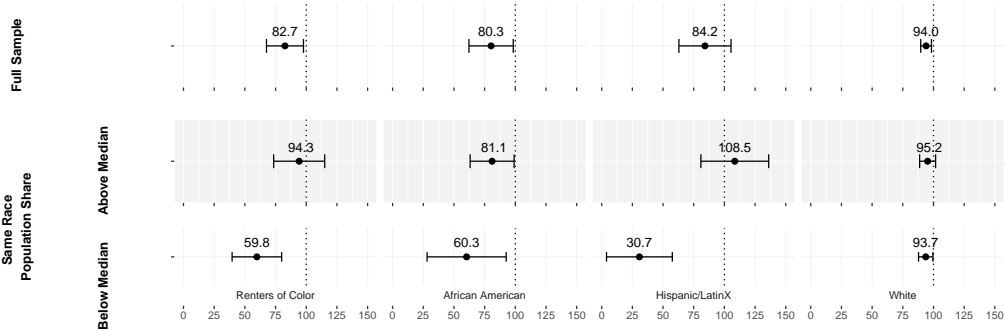
$$\frac{P(\text{Same Race} | \text{Response} = 0)}{P(\text{Same Race} | \text{Response} = 1)} = \frac{\alpha}{\beta_R + \alpha} \quad (5)$$

- This allows us to test the hypothesis that discriminatory constraints identified in the experiment also predict housing market outcomes outside the experiment.

Discriminatory Behavior and Housing Outcomes



Discriminatory Behavior and Housing Outcomes



Conclusions

- Our design provides a direct comparison of the magnitude of discriminatory behavior across the 50-city sample, allowing for a statistical ranking of the markets with the highest and lowest rates of discriminatory constraints.
 - ▶ Our results indicate that households of color face constraints when searching for rental properties in most U.S. markets
 - ▶ Intercity correlation between response rates to African American and LatinX renters is low (0.12)
- We find strong relationships between
 - ▶ neighborhood segregation and racial discrimination for African Americans in the rental market.
 - ▶ the income mobility gap and discriminatory constraints facing African American renters.
- Researchers have been unclear about the power of the correspondence design to predict differences in actual housing outcomes.
 - ▶ We provide the first test of the relationship between experimental evidence of disparate treatment and subsequent differences in renter location choices, revealing that discriminatory constraints provide important information about housing market outcomes

Thanks!

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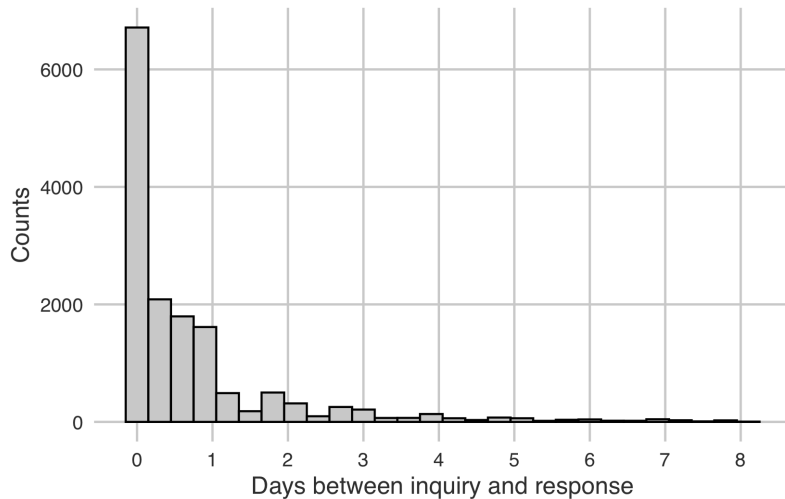
First Inquiry

	<i>Dependent variable:</i> <i>Response</i>	
	Full Sample (1)	First Inquiry (2)
African American	-0.0561*** (0.0063)	-0.0669*** (0.0133)
Hispanic/LatinX	-0.0277*** (0.0057)	-0.0302** (0.0133)
Mean Response (White)		
Gender	Yes	Yes
Education Level	Yes	Yes
Inquiry Order	Yes	
Observations	25428	8477

Notes: Table reports in column (1) coefficients from a within-property linear regression model including controls for gender, education and order the inquiry was sent. In column (2) from a linear model using only the sample of responses from the 1st inquiry made to a given listing. Standard errors clustered at the CBSA Downtown/Suburb level reported in parentheses.

* Significant at 10% level, ** significant at 5% level, *** significant at 1% level.

Randomization



Randomization

	(1)	(2)	(3)	(4)	(5)
<i>Panel A: Inquiry Order</i>					
	First	Second	Third		
African American	0.0101 (0.0093)	-0.0073 (0.0094)	-0.0028 (0.0094)		
Hispanic/LatinX	0.0074 (0.0094)	0.0027 (0.0094)	-0.0100 (0.0093)		
<i>Panel B: Evidence of Differential Choices by Weekday</i>					
	Mon	Tue	Wed	Thurs	Fri
African American	-0.0011 (0.0058)	-0.0015 (0.0052)	-0.0013 (0.0063)	0.0021 (0.0053)	-0.0011 (0.0062)
Hispanic/LatinX	0.0000 (0.0056)	0.0017 (0.0055)	0.0002 (0.0063)	-0.0004 (0.0053)	0.0012 (0.0055)
<i>Panel C: Gender and Mother's Education Level</i>					
	Gender		Mother's Education		
	Male	Female	Low	Medium	High
African American	-0.0006 (0.0080)	0.0006 (0.0080)	-0.0073 (0.0075)	0.0024 (0.0072)	0.0049 (0.0070)
Hispanic/LatinX	-0.0027 (0.0076)	0.0027 (0.0076)	-0.0050 (0.0072)	0.0016 (0.0071)	0.0035 (0.0079)
Mean Response (White)	0.60	0.60	0.60	0.60	0.60
Observations	25,428	25,428	25,428	25,428	25,428

Last Names

Panel B. Last Names Frequency of Occurrence in 2010 Census (%)				
Race	Last Name	African American	Hispanic/LatinX	White
African American	Harris	42.4	2.3	51.4
African American	Jackson	53.0	2.5	39.9
African American	James	38.9	3.1	51.6
African American	Williams	47.7	2.5	45.8
African American	Thomas	38.8	2.5	52.6
African American	Robinson	44.9	2.6	48.7
Hispanic/LatinX	Lopez	0.6	92.9	4.9
Hispanic/LatinX	Rodriguez	0.5	93.8	4.8
Hispanic/LatinX	Morales	0.6	93.2	4.6
Hispanic/LatinX	Sanchez	0.5	93.0	5.0
Hispanic/LatinX	Ramirez	0.3	94.5	3.9
Hispanic/LatinX	Torres	0.6	92.2	5.4
White	Murphy	11.5	2.3	83.1
White	Peterson	10.1	2.4	84.4
White	Cox	12.1	2.3	82.6
White	Myers	10.5	2.1	84.5
White	Wood	5.6	2.4	88.7
White	Miller	10.8	2.2	84.1

George Floyd and Covid

	<i>Dependent variable:</i>					
	<i>Response</i>					
	Full Sample (1)	Drop Month After G. Floyd Homicide (2)	Lockdowns		<i>p</i> -value diff. (1)-(2) (5)	<i>p</i> -value diff. (3)-(4) (6)
			Before (3)	After (4)		
<i>Panel A: Relative Responses</i>						
African American × Midwest	-0.1231*** (0.0251)	-0.1225*** (0.0288)	-0.1168*** (0.0325)	-0.1257*** (0.0334)	0.946	0.970
African American × Northeast	-0.1215*** (0.0176)	-0.1329*** (0.0196)	-0.1362*** (0.0326)	-0.1138*** (0.0151)	0.294	0.176
African American × South	-0.0755*** (0.0159)	-0.0808*** (0.0168)	-0.1021*** (0.0261)	-0.0599** (0.0233)	0.291	0.165
African American × West	-0.0788*** (0.0212)	-0.0825*** (0.0205)	-0.0724*** (0.0279)	-0.0814*** (0.0260)	0.104	0.948
Hispanic/LatinX × Midwest	-0.0359* (0.0207)	-0.0363* (0.0198)	-0.0607*** (0.0217)	-0.0237 (0.0293)	0.897	0.263
Hispanic/LatinX × Northeast	-0.0813*** (0.0278)	-0.0895*** (0.0306)	-0.1074*** (0.0345)	-0.0686** (0.0312)	0.849	0.125
Hispanic/LatinX × South	-0.0516*** (0.0153)	-0.0483*** (0.0156)	-0.0701*** (0.0239)	-0.0406* (0.0213)	0.397	0.279
Hispanic/LatinX × West	-0.0260* (0.0157)	-0.0116 (0.0179)	0.0302 (0.0278)	-0.0510** (0.0201)	0.016	0.033

Downtown and Suburbs

	<i>Dependent variable: Response</i>
	(1)
African American	-0.0545*** (0.0091)
African American Suburb	-0.0033 (0.0125)
Hispanic/LatinX	-0.0231*** (0.0074)
Hispanic/LatinX Suburb	-0.0093 (0.0114)
Mean Response (White) Downtown	0.62
Mean Response (White) Suburb	0.58
Gender	Yes
Education Level	Yes
Inquiry Order	Yes
Address FE	Yes
Observations	25,428

Match Rate InfoUSA

Race	Freq.	Percent
Af. American	665	12.24
Hispanic/LatinX	605	11.14
Other	317	5.83
White	3,846	70.79
Total	5,433	100

Match Rate InfoUSA

