

**MULTIDIMENSIONAL DISCRIMINATION IN THE ONLINE RENTAL HOUSING
MARKET: IMPLICATIONS FOR FAMILIES WITH YOUNG CHILDREN**

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A half century after the Fair Housing Act, a wide range of experimental, ethnographic, and observational research continues to document the persistence of racial discrimination in the housing market. While the prevalence of overt racism has declined, exclusionary practices continue to limit housing opportunity for people of color, thereby reproducing racial inequality and residential segregation. This study leverages an online field experiment conducted in 31 cities to investigate the extent to which discrimination by race is exacerbated (or mitigated) by two other dimensions of identity: family structure and source of income. Consistent with prior work, we find that blacks and Latinas face statistically and substantively significant discrimination in the search for rental housing. We further show that the gap between white and non-white outcomes is compounded by family structure. Specifically, only blacks and Latinas are penalized for being single mothers. Our results also indicate that landlord bias against recipients of Section 8 housing vouchers may be stronger than racial biases. Finally, we provide suggestive evidence that state and local laws prohibiting discrimination against voucher recipients may be effective in doing so.

Multidimensional Discrimination in the Online Rental Housing Market: Implications for Families with Young Children

The search for housing is a crucial site for the reproduction of stratification in a persistently segregated and increasingly unequal America (Logan and Stults 2011; Piketty 2014). Differential sorting across neighborhoods facilitates severe racial inequalities in exposure to crime (Peterson and Krivo 2012), school quality (Rich and Jennings 2015), wealth accumulation (Faber 2018; Flippen 2004), and a wide range of other spatially-organized phenomena shown to shape individuals' life chances (Sharkey and Faber 2014). While structural factors are an important driver of residential mobility patterns (Ross 2011), research continues to document discrimination in the housing market, such as racial steering, which entails discouraging blacks and Latinos from seeking housing in white neighborhoods (Bertrand and Duflo 2017; Besbris and Faber 2017; Hanson et al. 2016; Korver-Glenn 2018; Massey et al. 2016; Turner et al. 2013). Additionally, there is evidence that practices of exclusion and exploitation within the housing market have evolved in the decades since federal legislation made discrimination illegal (Massey 2005; Pager and Shepherd 2008). The documented persistence and evolving nature of housing discrimination motivate continued monitoring of the extent of racial bias and careful exploration of nuance in how discrimination manifests.

Existing studies of discrimination in housing focused solely on outcomes by race may both underestimate the true level of housing discrimination experienced by protected categories of home seekers, such as families with children, and obscure how overlapping disadvantage works in concert to shape housing outcomes (Friedman 2015). The present study contributes to this effort through examination of the ways in which racial and ethnic identity interact with

family structure (i.e. marital status and the presence of children) and source of income (i.e. employment and Section 8 housing voucher receipt) to shape disparate outcomes in the housing market. We leverage data collected via an online field experiment in 31 of the largest American cities to estimate multiple dimensions of discrimination. In doing so, we address questions about efficacy and equity in policy implementation for households potentially facing multidimensional discrimination in two key ways.

First, developing an intersectional understanding of bias in the housing market contributes to theories of race, family, and economic status by empirically linking discrimination originating from each identifying characteristic and evaluating the ways in which the real, lived experiences of competing privileges and disadvantages—often evaluated independently in empirical work—shape disparate outcomes (Crenshaw 1989). Second, with recent calls for a substantial increase in the availability of housing vouchers (Desmond 2016; H.R.3700) and HUD’s proposed changes that may broaden the geography available to voucher recipients (HUD 2016a), it is important to gain insight into heterogeneity in how voucher recipients experience the search for housing. For example, do white families with vouchers receive more positive responses from landlords and real estate agents than black or Latino families? Do voucher recipients experience less discrimination in states where source of income discrimination has been made illegal? By examining source of income discrimination in the context of other axes of disadvantage, the present study provides critical insight into patterns in how voucher recipients experience discrimination.

We ultimately find that intersecting identities can compound disadvantage in the search for housing. Specifically, we find evidence that there is strong bias against Section 8 voucher recipients and that this bias is largely concentrated in cities that do not protect voucher holders

against discrimination. We also find that messages with black and Latina names receive significantly fewer responses than white names—though only within the subsample of message that do not mention Section 8. Put differently, the voucher signal is so strong, that it drowns out the race effect. Finally, our results show substantial discrimination against black and Latina single mothers, but not against white single mothers. Together, these findings reveal a complex pattern of discriminatory practices shaped by race, family structure, and source of income.

Background

Causes of Discrimination

Efforts to understand inequality often examine the role of discrimination and its causes at the individual and organizational level (Pager and Shepherd 2008). At the individual level, early works on discrimination emphasized the role of prejudice or racial animus while later works highlight a change in racial attitudes characterized by a combination of negative beliefs about a group and abstract political ideologies that often reinforce inequality. Work at this level also examines the role of racial stereotypes, which studies indicate have remained stable over time. White Americans continue to associate blacks with being lazy and welfare dependent while Latinos are associated with being poor and unintelligent (Bobo & Kluegel 1997; Pager and Shepherd 2008). These stereotypes about racial differences are reflected in conscious and unconscious evaluations and may inform discriminatory treatment, shaping who can and who cannot access a job or housing, for example.

At the organizational level, studies examine the organizational context that individual actors operate in and how organizational practices inform these actors' cognitive biases and stereotypes (Pager and Shepherd 2008; Reskin 2000). Additionally, as Pager and Shepherd

(2008) emphasize, organizations themselves are situated within a larger context, with prevailing economic, legal, and social environments conditioning an organization's responses. When anti-discrimination laws are passed or amended, organizations may make an effort to signal compliance, with the substantive results of these efforts varying by the extent of government enforcement.

In the context of housing discrimination, factors at both the individual and organizational level may come in to play in enhancing access to housing for some and denying access to others. For example, an individual landlord may tell a rental applicant that an empty apartment is unavailable based on negative stereotypes held about the applicant's group membership. At the organizational level, rental agencies that are not subject to a legal framework that prohibits source of income discrimination may flat out deny a voucher recipient access to an apartment based on negative assessments of voucher recipients. Conversely, agencies located in a jurisdiction with these protections in place may exhibit varying levels of receptivity towards voucher recipients. As such, both individuals and organizations can play a role in producing inequality by denying a qualified applicant housing based on negative beliefs held about their group membership.

Measuring Housing Discrimination

In addition to understanding the causes of discrimination, studies also seek to determine the nature of discrimination and the degree to which it persists. Five commonly used approaches for measuring discrimination are: 1) reports from subordinate groups regarding their experiences with discrimination; 2) reports from potential discriminators focusing on their attitudes and actions; 3) statistical analyses investigating inequality in outcomes between groups; 4) studies of law and legal records and 5) experimental approaches, which include laboratory and field

experiments (Pager & Shepherd 2008; Quillian 2006). Unlike other measures, experimental approaches have the advantage of allowing researchers to account for potentially confounding influences through experimental control and randomized assignment making this an ideal method for assessing causality. In testing for discrimination in the housing market, field experiments, also referred to as audit studies, have been common. These studies have been critical in providing evidence of the existence of contemporary discrimination and for highlighting discrimination on the basis of several protected categories, including race, sex, familial status, and more recently, source of income.

While audit studies focused on racial differences in access to housing are numerous, studies examining how race intersects with membership in more than one disadvantaged group are more limited. Massey and Lundy's (1999) study of housing discrimination using a phone audit indicates that such studies are necessary to gain better insight into possible inter- and intra-group differences in exposure to discrimination. Drawing on sociolinguistic research indicating that American listeners can readily infer the race of a speaker through accent, grammar, and diction, researchers trained male and female auditors to call rental agents to inquire about apartments advertised in Philadelphia newspapers or rental guides. Auditors used three linguistic styles when making these calls: White Middle-Class English (WME), Black Accented English (BAE), and Black English Vernacular (BEV). Researchers characterized BAE as Standard English spoken with a "black pronunciation" of certain words and BEV as a combination of non-standard grammar spoken with a black accent, which researchers hypothesized would signal lower class origins.

Massey and Lundy (1999) ultimately found strong evidence of the existence of phone-based discrimination. As compared with whites, blacks were less likely to get through and speak

to a rental agent, less likely to be told of a unit's availability, more likely to pay application fees, and more likely to have creditworthiness mentioned as a potential problem in qualifying for a lease. Since auditors were given the same backgrounds, the most readily identifiable basis for this different treatment was the caller's perceived race.

Researchers also found that racial effects interacted with and were generally exacerbated by gender and class (Massey and Lundy 1999). Black women as a whole experienced the lowest probability of making contact and speaking with a rental agent and when they did make contact, females speaking BEV were the least likely to be told of a unit's availability. Overall, across all measures examined, females who spoke BEV consistently fared the worse. Based on these findings, researchers concluded that at minimum, black females could expect to put in 40% more effort than white males just to reach a rental agent. Results from this study provide strong evidence that research seeking to accurately measure the discriminatory experiences of home seekers must consider whether identifiable subsets of a sample experience discrimination that is different from the overall sample.

Similar to studies examining multiple dimension of discrimination, studies of discrimination on the basis of familial status are also limited. One of the first large paired-testing studies of discrimination against families with children used telephone and in-person paired tests to examine this issue in three metropolitan sites: Dallas, Texas; Dayton, Ohio; and Los Angeles, California (Aron et al. 2016). Findings from this pilot study, commissioned by HUD, indicate that when well-qualified homeseekers with children contacted rental-housing providers to inquire about advertised homes and apartments, those with children were as likely as comparably qualified homeseekers without children to get an appointment and learn about at least one available housing unit.

However, homeseekers with children were shown slightly fewer units and were told about units that were slightly larger and thus slightly more expensive to rent (Aron et al. 2016). For every six in-person visits to housing providers, families with children were shown one fewer rental unit. Taking other characteristics into account, the study found that factors such as the tester's race/ethnicity, marital status, and ages and sexes of the children did not appear to systematically affect how families with children were treated in the rental housing market.

Though limited in terms of generalizability, results from HUD's pilot study provide an springboard for future work examining discrimination against families in the U.S. context on two important facets of family structure: presence of children and marital status. Honing in on this area by estimating intra-racial differences in housing search outcomes (e.g. by comparing outcomes for black households without a child to those with a child) by varying family structure can help build a greater understanding of how this facet of family structure matters for housing outcomes. This includes explanations for why measures of residential segregation are higher among households with children (Owens 2016). Similarly, honing in on applicant marital status permits insight into whether marriage accrues the same benefits to non-white home seekers as prior studies have shown it affords white home seekers (Lauster and Easterbrook 2011). Given that family structure is potentially a site of dramatic racial disparity, it is a key variable in the present study.

At present, national studies examining discrimination against recipients of housing vouchers are also limited. We are aware of two studies that have experimentally evaluated discrimination against voucher holders in the rental housing market. The first, conducted by M. Kathleen Moore (2016), is unpublished and findings from the study are not publicly available. Record of a conference presentation suggests Moore investigated racial discrimination as well as

discrimination against voucher holders in fourteen metropolitan areas that varied in their prohibition of source of income discrimination (Moore 2016). The present study is a substantial expansion on Moore's work based on both our inclusion of more than twice as many cities and our simultaneous investigation of the role of family structure (i.e. marital status and presence of children) in shaping outcomes among voucher holders.

The second, a pilot study commissioned by HUD and referenced earlier in this paper, represents the first large-scale, multi-site examination of whether landlords treat people with vouchers differently than other renters (Cunningham et al. 2018). One goal of the study was to measure the prevalence and extent of voucher-related discrimination, including differences in discrimination against racial and ethnic minorities and differences between low- and high-poverty neighborhoods. The study used a three-stage testing methodology to examine interactions with landlords during the housing search. The first stage, the "voucher acceptance test," was conducted in five sites: Fort Worth, Texas; Los Angeles, California; Newark, New Jersey; Philadelphia, Pennsylvania; and Washington, D.C. During these tests, a female tester who would be perceived as white called landlords advertising rental units and asked whether they accepted housing vouchers. If a landlord indicated that vouchers were accepted, the test moved on to the second and third stages, which were conducted in three sites: Fort Worth, Los Angeles, and Newark.

In the second stage, pairs of white, black, and Latina female testers, matched on all characteristics except for voucher use (i.e. white voucher recipient versus white non-voucher recipient, black voucher recipient versus black non-voucher recipient, and Latina voucher recipient versus Latina non-voucher recipient) conducted telephone tests to determine whether voucher recipients were told about available housing and were able to secure appointments to

view available units (Cunningham et al. 2018). If both testers were able to secure appointments, they proceeded to the third stage, an in-person tests to determine whether voucher recipients were able to meet with a landlord to see available housing.

Results from the study indicate clear evidence of outright denial of vouchers, although denial rates varied widely (Cunningham et al. 2018). Denial rates were highest in Fort Worth (78 percent) and Los Angeles (76 percent) and only somewhat lower in Philadelphia (67 percent). Rates were substantially lower in Newark (31 percent) and Washington, D.C. (15 percent). Across the five sites, between 9 and 25 percent of landlords said that vouchers were accepted only under certain conditions or that they were unsure of the voucher acceptance policy. Additionally, in all the sites but Washington, D.C., voucher denial rates were substantially higher for low-poverty census tracts than for high-poverty tracts.

Notably, the study found lower landlord denial rates in sites that have legal protections against voucher discrimination (Cunningham et al. 2018). In Newark and Washington, D.C., where voucher holders are a protected class under local source of income anti-discrimination laws, denial rates were lower compared with sites without these laws. Authors of the report caution that while these results are suggestive of and consistent with a desirable voucher ordinance effect, it is not possible to conclude that voucher protections cause fewer denials since housing market tightness, public housing authority performance, and other factors could also affect landlord denial rates.

Finally, researchers explained that while they aimed to examine differences by race and ethnicity, high voucher denial rates during the voucher acceptance test hindered efforts to conduct sufficient in-person tests to conclusively analyze whether differential treatment against voucher holders varied by race (Cunningham et al. 2018). Comparison of differences in

treatment experienced by non-white voucher holders with that of white voucher holders would have required a larger sample of in-person paired tests, which could not be conducted due to the high rates of landlord denials. Researchers noted that future testing would need to balance the goal of understanding the role of race in voucher discrimination with that of isolating the incidence and nature of voucher discrimination. The present study takes up both of these critical issues in its specific analyses of housing discrimination at the intersection of race, ethnicity, and voucher use.

Experimental design

We designed and implemented an online field experiment to measure whether the intersecting identities of race, family structure, and voucher receipt trigger discriminatory behavior in the Craigslist online rental housing market. Through e-mail correspondence, we posed as prospective female renters and responded to posts for rental units in a manner that signaled a) race/ethnicity, b) family structure, specifically, parental and marital statuses, and c) source of income, with signals for receipt of a housing voucher and/or employment. Our study took place in 31 cities representing the geographic and demographic diversity of the country (Table 1). We selected the 10 largest American cities and supplemented the sample with 21 additional cities that vary in the legal status of source of income discrimination (Scott et al. 2013).

[Table 1]

We selected an online setting because the search for housing increasingly takes place online and online audits offer greater precision than in-person audits because all aspects of experimental variation are under investigator control (Boeing and Waddell 2016; Oh and Yinger 2015). While there may be concern that the voucher-eligible population is unlikely to use online markets to find housing, searches conducted on Craigslist for “Section 8” result in hundreds of units in all studied cities, providing strong evidence that voucher recipients use this market. For example, a November 23, 2016 search for “Section 8” in New York identified 579 units. There have also been numerous media reports of discrimination against Section 8 recipients on Craigslist in several of the cities included in this study, including New York (Murphy 2016), Chicago (Yousef 2015), and Baltimore (Badger 2016a), which provide additional support for the importance of assessing the extent and nature of discrimination within this online market. Furthermore, recent research has documented that the proportion of units available on Craigslist that are below HUD Fair Market Rents (FMR) is representative of the American rental market—though there is substantial geographic variation in the prevalence of affordable units (Boeing and Waddell 2016). Finally, the ubiquity of Craigslist provides the empirical benefit of access to almost the entirety of the country’s urban rental housing market. Because of this, our study will be the first to systematically evaluate whether discrimination against voucher holders exists in multiple cities while also investigating intersectional bias against black and Latina single mothers.

Signaling race, family structure, and source of income (SOI)

Similar to numerous other field experiments assessing discrimination in a wide range of social interactions, including the search for housing, we used first and last names to signal race,

ethnicity, and gender (for a review, see Bertrand and Duflo 2016). We were primarily concerned with the experiences of white, black, and Latina women because the vast majority (84%) of single parent households are headed by women and this household structure is substantially more common among these groups as compared to Asians: 54% of black children are in single family households, compared to 29% of Latina/Latina children, 20% of white children, and only 13% of Asian children (Census 2015). To examine the experience of blacks and Latinas relative to whites, we used racially identifiable first names for women that have been leveraged in previous research (Gaddis 2015; Lavender 1988; Sharma et al. 2015) and the most racially homogenous last names according to the Census (Census 2000). Using the first and last names displayed in Table 2, we created nine signals of each race/ethnicity, which we randomly assigned to our messages.

[Table 2]

Our inquiries included signals of family structure similar to those used in previous research (Lauster and Easterbrook 2011). Half of our messages signaled the presence of a husband and we randomly assigned mention of an infant, a third grade child, or no child. It is possible that limiting our signals to the presence of one young child may result in a conservative estimate of the discrimination experienced by voucher holders who are parents. The presence of adolescent children—particularly adolescent black and Latina sons—may result in greater discrimination than the presence of an infant or third grader. Though this is clearly an issue

worthy of investigation, we undertake an empirically conservative approach for practical reasons.¹

Each inquiry signaled source of income as follows: 1) no mention of employment, 2) mention of employment, 3) mention of employment with a housing voucher, or 4) mention of just a housing voucher. By comparing the three conditions in which at least employment or voucher receipt are signaled, we are able to examine voucher receipt as a source of income isolated from any stigma associated with it. If landlords did not discriminate against voucher holders, response rates for those who signal both employment and voucher receipt may be higher than those who only signal employment, because the voucher constitutes stable income in addition to wages from a job. Similarly, an observed disparity between those who only have a job and those who only receive a voucher may be interpreted solely as discrimination based on income if the landlord assumes the person only signaling voucher receipt is otherwise unemployed. Therefore, to distinguish discrimination based on source of income from that based on level of income, we need to compare all three experimental signals.

Constructing messages to landlords

Rather than constructing “paired” responses that are identical on all but one characteristic, such as race, we randomly assigned all characteristics in each message. The primary motivation behind this approach was practical: by randomly assigning message components, we reduced the risk of detection by landlords if we unknowingly sent multiple messages to the same respondent (e.g. an apartment broker/landlord who does not include

¹ An exploration of compounding discrimination against families with male adolescents relative to families with younger children would require additional signals for older children (i.e. teenager or tenth-grader), and sex (i.e. boy or girl), and possibly race/ethnicity (i.e. if we do not assume respondents would infer that mothers and sons always have the same race/ethnicity). We were concerned that adding these experimental variations would have limited statistical power.

identifying information in his/her listings). With a large sample, such a method allows for statistical comparisons across experimental signals (e.g. married and unmarried signals) as well as within groups (e.g. Latina women with and without children) (Besbris et al. 2015; Gaddis 2015; Lauster and Easterbrook 2011).² Table 3 provides examples of experimental message structure and intended signals. All inquiries indicate interest in a unit and relevant signals, including a signature with a racialized name. Because the order in which experimental signals are presented may affect estimations of any dimension of discrimination, we randomly assigned messages to either signal race at the front of the inquiry or the end.

[Table 3]

Data Collection

On Mondays and Thursdays, we responded to the most recent post for a one- or two-bedroom unit³ on the first two pages of each local market (i.e. the newest and 100th newest posts). Because voucher recipients who choose units with rents above HUD Fair Market Rents (FMR) must pay the difference between FMR and the higher rent, we limited searches to units with rents below FMR in each city. Consistent with literature on online field experiments, limiting data collection to once a week reduced risk of detection (Oh and Yinger 2015). In

² For examples of field studies that have used random assignment in lieu of constructing experimental pairs, see Besbris et al. (2015); Hanson et al. (2016); Lauster and Easterbrook (2011).

³ This variation allows us to assess the impact of unit size on bias against various family structures. Specifically, families may be refused a unit if the landlord believes it to be too small (Turner 2015) or some landlords may refuse to rent a one-bedroom apartment to a family with a child due to housing codes that mandate children above a certain age sleep in a separate room from their parents. However, we still expect to see racial differences within households with the same family structure driven by, for example, a landlord's greater willingness to circumvent housing codes for tenants they perceive as more attractive (i.e. white families). Similarly, some landlords may simply prefer smaller households because of decreased wear and tear on the unit. Though discrimination based on household size is not illegal, it is worthwhile to explore the extent to which household characteristics interact to shape disparate patterns in the search for rental housing across racial groups.

addition to a conservative sampling schedule, we created protocols to avoid sending a housing agent multiple messages, including searching posts we responded to in the past for identical information (i.e. contact phone number).

We gathered a wide range of information on each advertisement, including the unit's square footage, number of bedrooms and bathrooms, rent, whether the phone number of the representative is included, the full text of the title and advertisement, and the dates of both the original posting as well as any update of the post. Following a similar response coding scheme used by Besbris et al. (2015), our primary outcome of interest was whether our inquiries received at least one response from landlords—multiple responses were too rare to model. Between October 2, 2017 and July 2, 2018, we sent 1,978 inquiries to the representatives of rental units in 31 cities.⁴

Estimating multidimensional discrimination

We statistically model the likelihood of receiving any response using linear probability models for ease of interpretation of interactions. Differences in outcomes across race/ethnicity, family structure, and voucher receipt are of primary concern, as are differences between cities that allow and prohibit discrimination based on housing voucher receipt. Because we are also interested in whether these characteristics work in concert to shape housing opportunity (e.g. do black women incur a larger penalty for voucher receipt than white women?), we estimate additional interacted models. Our statistical models will control for the characteristics of the advertisement as well as experimental characteristics (e.g. variations in our message text, month

⁴ Although the experiment lasted 39 weeks, the total number of observations is not equal to 2418 (i.e. 39 * 2 messages per week * 31 cities) due in part national holidays (on which we did not collect data) as well as occasional issues with data collection (e.g. research assistant hiring cycles). Statistical models include indicator variables for the month in which our message was sent and a measure of the number of messages previously sent in each local market to control for these idiosyncrasies.

in which the message was sent, and the number of previous messages sent in each market). In addition to modeling the likelihood of receiving any response, we will investigate variation across experimental signals in the likelihood of types of response (e.g. negative Section 8 response conditional on response) using similar statistical techniques.

Because our experiment takes place at the initial stage of a housing search (i.e. outreach to brokers/landlords), we will likely understate the total extent of discrimination because we will not capture subsequent interactions, such as face-to-face interviews. Therefore, we will interpret results as lower bound estimates of discrimination.

Results

Of the 1,978 inquiries we sent to landlords between October 2, 2017 and July 5, 2018, 37.9% received at least one response. We observed substantial variation in response rate across experimental signals. For example, only 33.4% of messages that mentioned Section 8 voucher receipt garnered a reply—a rate significantly lower than messages that did not mention a housing voucher (42.3%). Emails that mentioned a husband were significantly more likely to earn a response (40.5%) compared to those that did not (35.4%). On average, messages with and without mention of a child received responses at the same rate (37.9%).

[Figure 1]

Although the difference in response rate was higher for white names (40.5%) compared to Latina (36.6%) and black (36.9%) names, these differences were not significant. However, closer examination of these results reveal important heterogeneity. Figure 1, which shows

differences in response likelihood across both race and Section 8 signals, indicates that there were dramatic (and statistically significant) racial disparities among the 1,007 apartment inquiries that did not mention a voucher. Within this subset of the sample, 48.1% of emails from white names received at least one reply, compared to 41.3% of Latina names and 37.2% of black names. Both the white-black and white-Latina differences are statistically significant. When we did mention a Section 8 voucher, names of all three races received approximately equivalent replies. One interpretation of this dynamic is that only white women are penalized for receiving a housing voucher given that their likelihood of hearing back from a landlord declines to that of a black or Latina woman. A more plausible interpretation is that the voucher signal is so strong that the race signals are made invisible.

[Figure 2]

While, on average, mentioning a husband increased response rate, further analysis of the subset of messages without a voucher signal provide evidence of substantial variation in the importance of family structure by race. Figure 2, which shows response rates by race and the presence of a child among single women without a voucher signal (i.e. for messages that did not mention a husband or voucher), suggests that only black women suffer a penalty for being a single mother. Only 31.5% of emails from single, black mothers received a response, compared to 48.7% among single, white mothers. We explore these dynamics in more detail below.

Model estimates of multidimensional discrimination

We next move on to regression estimates of the outcomes described descriptively above. Table 4 presents selected results⁵ from a series of linear probability models predicting the likelihood that a message receives a response. Because we did not conduct a matched-pair study, all models include a full set of controls for experimental variables (e.g. message text and signal order), apartment listing characteristics (e.g. number of bedrooms and bathrooms), as well as city fixed effects and month fixed effects.

[Table 4]

Model 1, which is estimated among the full sample of sent messages, reflects what was described above: the Section 8 voucher signal significantly decreases the likelihood of reply, while mentioning a husband significantly increases that likelihood. The coefficients for Black and Latina signals are negative, though not significant. Models 2 and 3 disaggregate the sample by voucher signal. In Model 2, which only includes inquiries with the Section 8 signal, the only significant coefficient is that for husband—it remains positive. Once voucher messages are excluded in Model 3, the coefficients for black and Latina names gain significance. The response rate among black women was 14% lower than white women. Among Latina women, the rate was 8% lower. These results are in line with prior work showing that an applicant’s race and ethnicity can help or hinder their access to housing.

[Table 5]

⁵ Full results available upon request.

Regression models provide further support for racial heterogeneity in the role of family structure initially indicated in Figure 2 above. Table 5 displays selected results from linear probability models estimating response likelihood including an interaction between husband and child signals. The first model shows that, on average, messages that mentioned both a husband and a child were more likely to receive a response than messages that signaled a single mother (i.e. the reference category). However, the next four models, which disaggregate results by race and ethnicity, indicate that family structure only matters for non-white women. Among black women (column 3), messages that a) mentioned both a child and husband and b) messages that signaled neither child nor husband were both more likely to receive a response compared to messages from single mothers. Among Latinas (column 4), messages signaling a married couple without children received the most replies. These observed patterns suggest that landlords and realtors may hold assumptions regarding acceptable family structures that vary by race and ethnicity and may penalize families that deviate from these assumptions (Sarkisian and Gerstel 2012).

[Figure 3]

We also find evidence that the severity of racial discrimination varies within the rental market itself in an interaction between race signal and the asking rent for an apartment. Figure 3 displays marginal effects from a model predicting response likelihood with such an interaction. The model includes a full set of controls and excludes messages that included the Section 8 signal. The pattern is striking: discrimination against black and Latina women is strongest among

units with the lowest rents and essentially disappears at the top of the distribution.⁶ These results suggest that the poorest people of color face the greatest racial barriers in the housing search—a troubling compounding of disadvantage.

[Table 6]

SOI Antidiscrimination policy efficacy

Our main findings (Table 4) regarding SOI discrimination indicate that mentioning receipt of a housing voucher leads to significantly worse outcomes for women seeking rental apartments. We also estimated the efficacy of state and local antidiscrimination laws by stratifying the sample based on the legal status of source of income discrimination. In 13 of the 31 cities in our sample, SOI discrimination was illegal at some point during our study (Table 1). When we estimated the likelihood of response within these cities (Model 1 of Table 6), the coefficient for the Section 8 signal is not significantly distinguishable from zero. Conversely, within the 18 cities that never had anti-SOI discrimination laws, the coefficient for the voucher signal is negative and highly significant (Model 2 of Table 6).

Robustness checks

We conducted numerous robustness checks to confirm our findings. We first tested whether our findings of racial discrimination depended on the specific name used because previous research has shown that the strength of the race signal can depend on name choice (Gaddis 2015). We reestimated the magnitude of racial discrimination within the subsample of messages that did not

⁶ It is important to note that we only applied to units with a listed rent below the local Fair Market Rent, so we are not capturing the entire rental market.

include a Section 8 signal 27 times—each time removing one of the names from the sample. Appendix Figure A1 plots coefficients from each of these models and indicates that no single name is driving the negative correlation between black or Latina signals and the likelihood of receiving a response. We also conducted a similar analysis to investigate whether our estimates of bias against black and Latina women were due to a single city. Appendix Figure A2 plots coefficients from 31 models in which we removed each city from the sample. The pattern of racial discrimination was consistent across subsamples.

Discussion

This study explored multiple, intersecting dimensions of discrimination in the market for rental housing in 31 of the largest cities in the United States through an online field experiment. We find substantively and statistically significant evidence that race, family structure, and source of income shape the likelihood of success in the search for rental housing in important and compounding ways.

Landlords were less likely to respond to our inquiries when we signaled receipt of a Section 8 housing voucher. This signal was so strong, that our race signals did not significantly affect response rates among messages that mentioned Section 8. However, race was a powerful predictor of response likelihood within the subset of emails that did not mention voucher receipt. Both black and Latina names received significantly fewer responses than white names. Additional analyses show that racial discrimination was most severe at the lower end of the rental market, suggesting that the most economically disadvantaged blacks and Latinas face compounding discrimination in the search for housing. Furthermore, we find that only blacks and

Latinas are penalized for being single mothers. Among whites, family structure is not predictive of response rate.

Though our results provide critical insight into the challenges families seeking housing might encounter based on race, ethnicity, family structure and voucher receipt, and the intersection of these dimensions, there are limitations to our findings. First, although we find some evidence that state and local laws may be successful in preventing source of income discrimination, our estimates are obtained by comparing outcomes in cities that ever had such laws to those that never did during the period of study, rather than through assessment of change over time in the legality of SOI discrimination within cities. These results, therefore, are threatened by concerns of endogeneity and offer imperfect causal estimates. Specifically, it is possible that the relationship between SOI antidiscrimination laws and outcomes explored in this manuscript are confounded by an omitted variable (e.g. variation in propensity to discriminate across cities). Future work should leverage pending legislation to more cleanly measure the effect of SOI antidiscrimination policies.

Second, while the search for housing is a multi-stage process, our experiment only explores discrimination at the very first point of interaction between landlord and home seeker. If we assume that discriminatory patterns are also present at stages beyond initial contact (Korver-Glenn 2018), we are likely underestimating the total amount of discrimination against women of color and voucher holders in the entirety of the housing search.

Third, our experiment only explored the extent of discrimination within one market. Although Craigslist is the largest online housing market and evidence suggests it is representative of the entire rental market (Boeing and Waddell 2016), it is possible that discriminatory patterns are different in the other housing search contexts. It is unclear whether

such patterns are more or less severe in in-person housing searches, for example, though qualitative work has documented systemic bias against people of color (Besbris and Faber 2017; Desmond 2016) and voucher recipients in these contexts (Rosenblatt and DeLuca 2012).

Despite these limitations, this paper carries implications for our understanding of race, family, and policy. Although racial discrimination in the housing market is certainly not a new phenomenon, continued monitoring of its extent and nature is of crucial importance to scholars of segregation and racial stratification more broadly (Massey 2005; Pager and Shepherd 2008; Quillian et al. 2017). Importantly, our experimental design allows for estimation of heterogeneity in the experience of discrimination across and within racial/ethnic groups. For example, our finding that only blacks and Latinas face discrimination for being single mothers suggests that previous estimates of discrimination based on race and family structure may be obfuscating crucial nuance regarding the ways in which the real, lived experiences of competing privileges and disadvantages shape disparate outcomes. In terms of policy, our findings suggest that dramatically expanding the Section 8 program needs to coincide with a broadening of SOI antidiscrimination laws.

Next steps

We will extend this project in three ways between Fall 2018 and PAA in 2019. First, and most importantly, we will continue data collection. Although the analyses presented here are based on data through July, the experiment is ongoing and scheduled to conclude in March, 2019. By PAA, we will have approximately twice as many observations, which will result in far more precise estimates—especially regarding models interacting experimental variations (e.g. race and family structure).

Second, we will conduct a more thorough analysis of the efficacy of source of income antidiscrimination laws. The current findings, which suggest these laws may reduce discrimination against Section 8 voucher holders, only operationalizes legal protection by stratifying the sample into cities that ever had such laws and those that did not. However, there was variation over time within several of the study cities (i.e. Pittsburgh, Minneapolis, and Washington D.C.). We hope to leverage this variation to more precisely estimate the effect of these laws on discrimination. We will also explore whether there are differences in the effectiveness of state-level and local-level antidiscrimination laws.

And third, we will investigate the role of neighborhood characteristics in mitigating or moderating discrimination. Most apartment listings in our analytical sample include the unit's location (e.g. address or intersection). Using this information will allow us to link apartments to census data describing neighborhood sociodemographic characteristics (e.g. racial makeup) and to assess the extent to which discrimination in the rental housing market is exacerbated by such characteristics leading different home seekers into or away from different types of neighborhoods.

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Figures and tables

Figure 1: Response rate by race and voucher signals

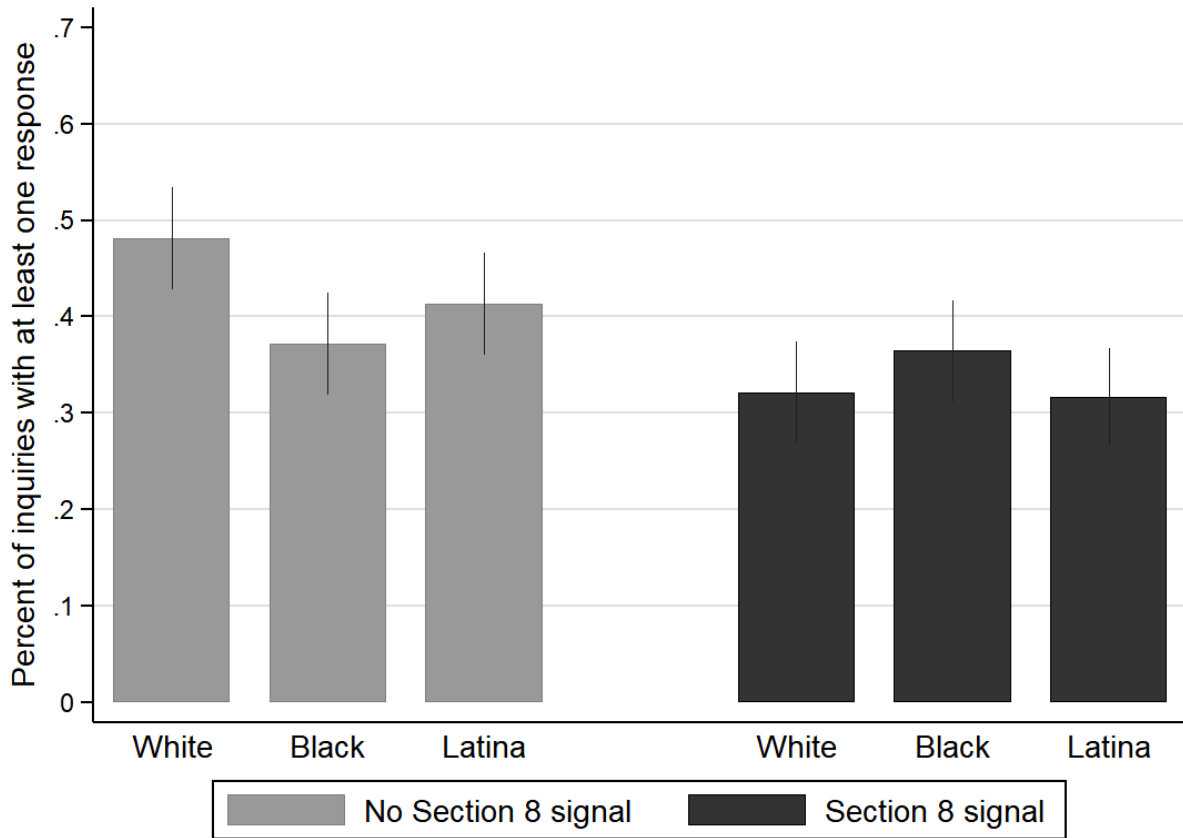


Figure 2: Response rate by race and child signals among single women without a Section 8 signal

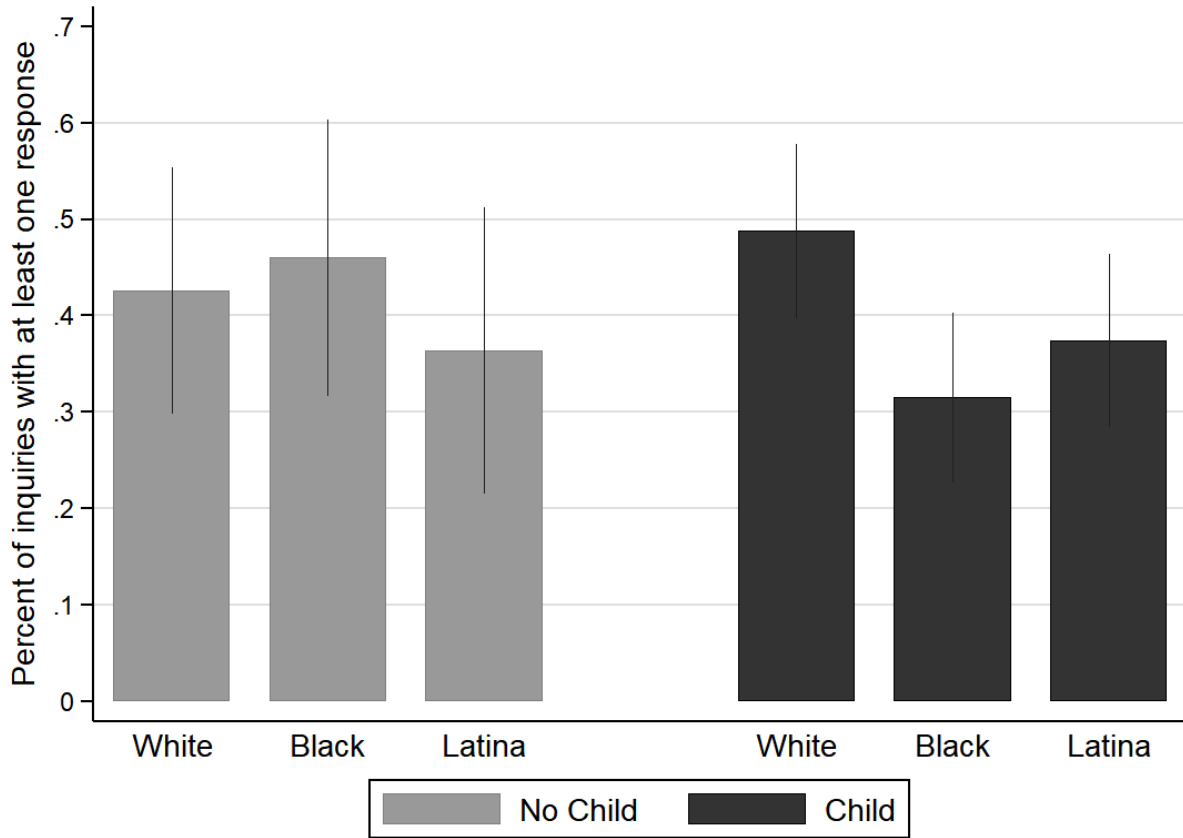


Figure 3: Marginal effects from model estimating response rate among messages without a Section 8 signal

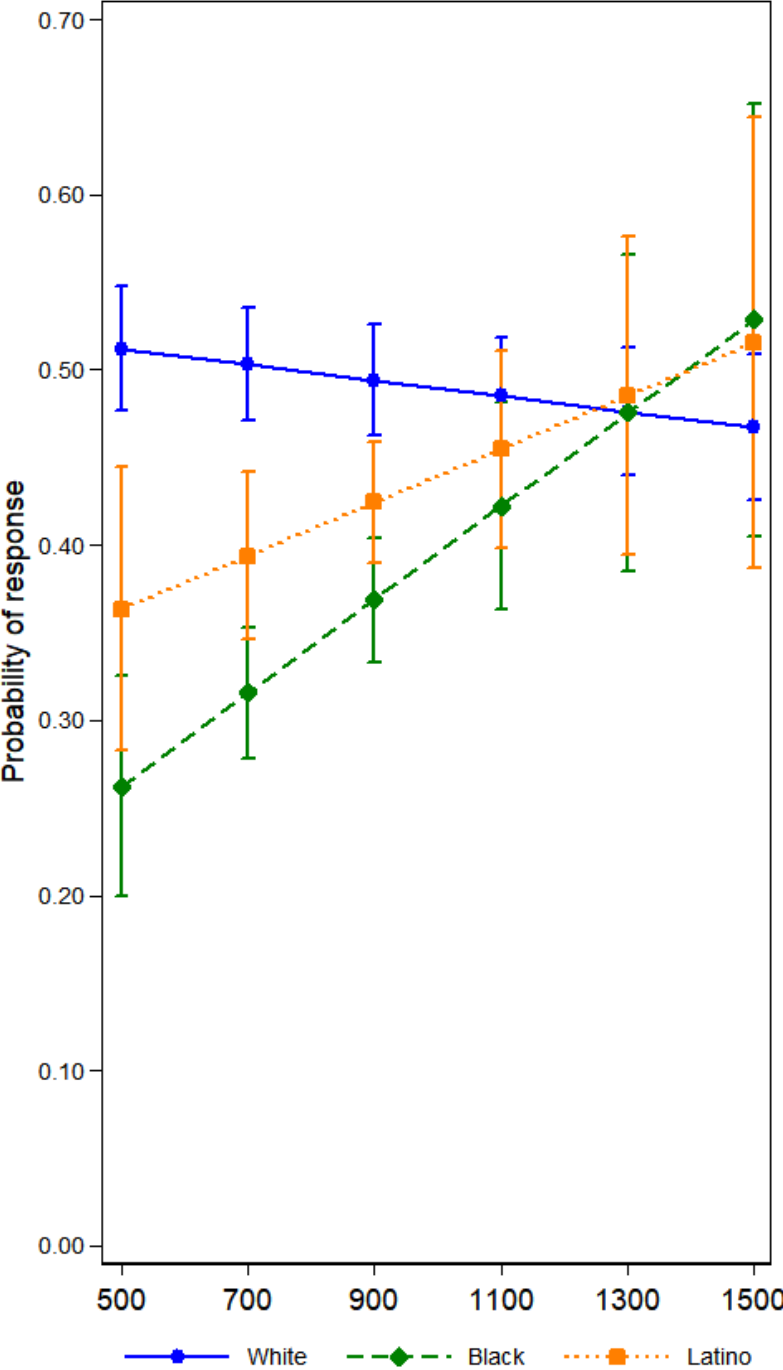


Table 1: Cities in which field experiment took place by region and policy environment

Region	Source of income discrimination: Legal throughout the experiment	Source of income discrimination: Illegal at some point during the experiment
Northeast	Providence, Allentown	New York, Philadelphia, Pittsburgh, Washington D.C., Boston
Midwest	Columbus, Milwaukee, Minneapolis, Indianapolis	Chicago, St. Louis, Oklahoma City
South	Charlotte, Dallas, El Paso, Fort Worth, Houston, San Antonio, New Orleans, Atlanta, Jacksonville	Austin, Miami, Baltimore, Memphis
West	Denver, San Diego, Phoenix	Los Angeles
Note: SOI discrimination legality data from Scott et al. (2013)		

Table 2: First and last names used to signal home seeker race and ethnicity

Race/Ethnicity	First names	Last names (percent belonging to the race signaled)
White	Emily, Sarah, Megan	Wood (90%), Carlson (96%), Walsh (96%)
Black	Ebony, Keisha, Latoya	Washington (90%), Jackson (53%), Banks (54%)
Latina	Ana, Maria, Rosa	Rodriguez (93%), Hernandez (94%), Gonzalez (94%)
White and black names were selected from Gaddis (2015), while Latina names were selected from Lavendar (1988) and Sharma et al. (2015). Last name data were from the Census (2000).		

Table 3: Sample messages and characteristics signaled

Message	Child	Married	Employed	Voucher	Race
Hello! I saw your ad on Craigslist for the apartment. I am looking for an apartment for myself and my third grade child. I have a Section 8 housing voucher. I look forward to hearing from you. -Ebony Washington	Yes	No	No	Yes	Black
Hello! I saw your ad on Craigslist for the apartment. I am looking for an apartment for myself, my husband, and my infant. I have a full time job. Is this unit still available? -Rosa Hernandez	Yes	Yes	Yes	No	Latina
Hello, I am responding to your apartment ad on Craigslist. My name is Emily Meyer. I am looking for an apartment for myself. I have a full time job. I look forward to hearing from you.	No	No	Yes	No	White
Hi! I am interested in your apartment listing on Craigslist. I am looking for an apartment for myself and my third grade child. I have a full time job and a Section 8 housing voucher. I look forward to hearing from you. -Ebony Jackson	Yes	No	Yes	Yes	Black

Table 4: Linear probability models of whether an apartment inquiry received at least one email response

	Sample: All Inquiries Model 1		Sample: Section 8 Signaled Model 2		Sample: Section 8 Not Signaled Model 3	
<i>Race</i>						
Black	-.03	(.03)	.06	(.04)	-.14***	(.04)
Latina	-.03	(.03)	.01	(.04)	-.08*	(.04)
<i>Family Structure</i>						
Child	-.01	(.03)	.00	(.05)	-.01	(.03)
Husband	.05*	(.02)	.06+	(.03)	.03	(.03)
<i>Source of Income</i>						
Section 8	-.09**	(.03)				
Full time job	-.01	(.02)	-.00	(.03)	-.04	(.03)
Observations	1978	0	971	0	1007	0

Notes: All models include a full set of experimental and advertisement controls. Robust standard errors in parentheses. + p<.1, * p<.05, ** p<.01, *** p<.001

Table 5: Models of family structure stratified by race

	Full Sample	White names	Black names	Latina names	Non-white names
No child no husband	.04 (.03)	-.02 (.07)	.12+ (.07)	.07 (.05)	.08+ (.04)
Husband and no child	.04 (.04)	-.05 (.07)	.07 (.06)	.10+ (.06)	.08* (.04)
Child and husband	.07** (.02)	.04 (.04)	.11* (.04)	.07 (.04)	.08** (.03)
Black	-.03 (.03)				-.01 (.03)
Latina	-.03 (.03)				
Observations	1978	657	654	667	1321

Notes: All models include a full set of experimental and advertisement controls. Robust standard errors in parentheses. + p<.1, * p<.05, ** p<.01, *** p<.001

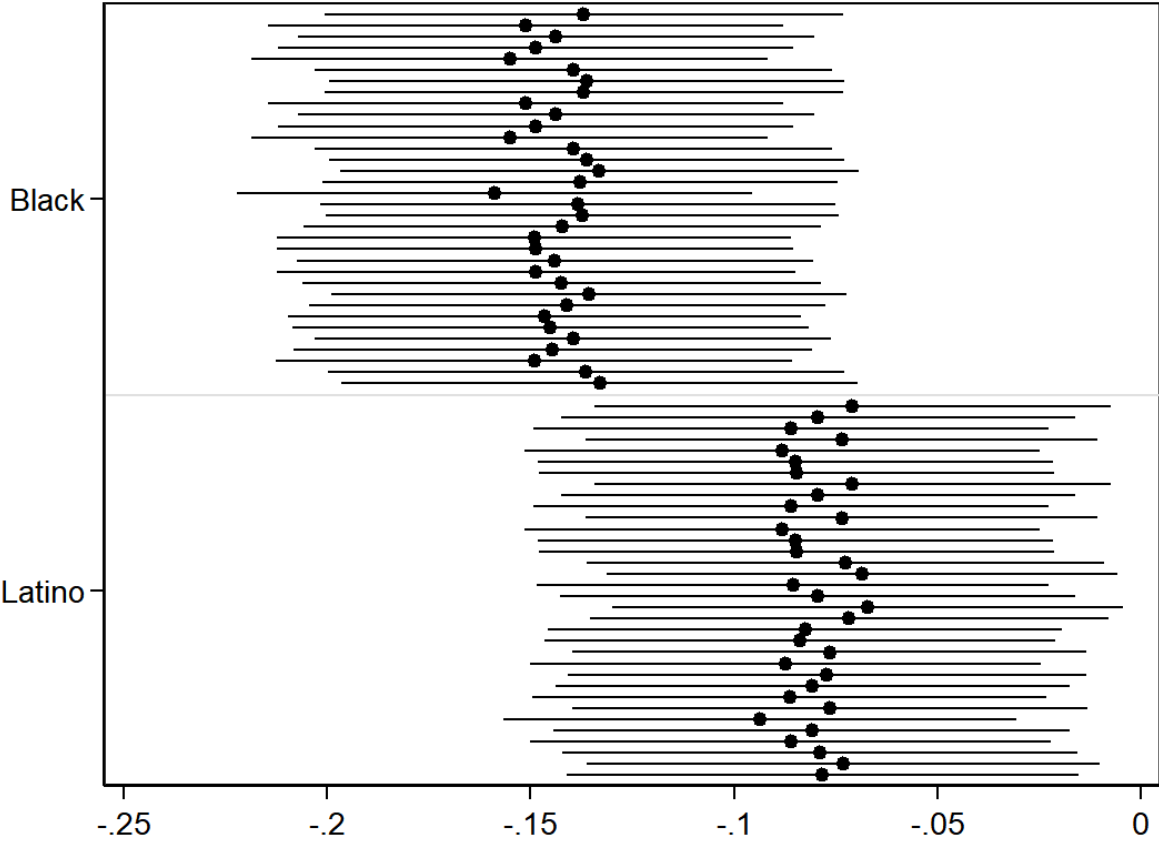
Table 6: Estimates of antidiscrimination law efficacy

	Model 1	Model 2
Section 8	-.06 (.06)	-.10*** (.03)
Black	.01 (.04)	-.05 (.04)
Latina	.07 (.04)	-.08* (.03)
Child	-.01 (.06)	-.01 (.03)
Husband	.07* (.03)	.03 (.02)
Full time job	.04 (.03)	-.04 (.03)
Observations	643	1335

Notes: All models include a full set of experimental and advertisement controls. Robust standard errors in parentheses. + p<.1, * p<.05, ** p<.01, *** p<.001

Appendix figures and tables

Appendix Figure A1: Coefficient plot testing sensitivity of findings to each name



Appendix Figure A2: Coefficient plot testing sensitivity of findings to each city

