# Discrimination Against Gay and Transgender People in Latin America: A Correspondence Study in the Rental Housing Market *

Nicolás Abbate[†]    Inés Berniell[‡]    Joaquín Coleff[§]    Luis Laguinge[¶]

Margarita Machelett[‖]    Mariana Marchionni[**]    Julián Pedrazzi[††]

María Florencia Pinto[‡‡]

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## Abstract

We assess the extent of discrimination against gay and transgender individuals in the rental housing markets of four Latin American countries. We conducted a large-scale field experiment building on the correspondence study methodology to examine interactions between property managers and fictitious couples engaged in searches in a major online rental housing platform. We find evidence of discriminatory behavior against heterosexual couples where the female partner is a transgender women (trans couples): they receive 19% fewer responses, 27% fewer positive responses, and 23% fewer invitations to showings than heterosexual couples. However, we find no evidence of discrimination against gay male couples. We also assess whether the evidence is consistent with taste-based discrimination or statistical discrimination models by comparing response rates when couples signal a high socioeconomic status (high SES). While we find no significant effect of the signal on call-back rates or the type of response for high-SES heterosexual or gay male couples, trans couples benefit when they signal a high SES. Their call-back, positive-response, and invitation rates increase by 25%, 36% and 29%, respectively. These results suggest the presence of discrimination against trans couples in the Latin American online rental housing market, which seems consistent with statistical discrimination. Moreover, we find no evidence of heterosexual couples being favoured over gay male couples, nor evidence of statistical discrimination for gay male or heterosexual couples.

JEL Classification: C93, J15, R23, R3
Keywords: LGBTQ+, discrimination, correspondence study, rental housing market, Latin America.

# 1 Introduction

Despite increasing efforts to provide equal rights and opportunities to members of the LGBTQ+ community—i.e., lesbian, gay, bisexual, transgender, queer, and other diverse sexual orientations and gender identities—, discrimination based on gender and sexual orientation still persists and plays an important role in the lives of LGBTQ+ people all around the world, and Latin America is no exception (Urban et al., 2020). Anecdotal evidence and survey data suggest that one of the areas where these groups continue to face strong discriminatory contraints in the region is the housing market.[1] For instance, a large share of the population in Latin America respond that they would not like to have homosexuals as neighbors when interviewed by the World Values Survey. Figure 1 shows that the percentage varies from almost 10% in Argentina, Uruguay, and Brazil, up to more than 30% in Colombia, Ecuador, Guatemala, and Peru.

Figure 1: Percentage of individuals that would not like to have homosexual neighbors
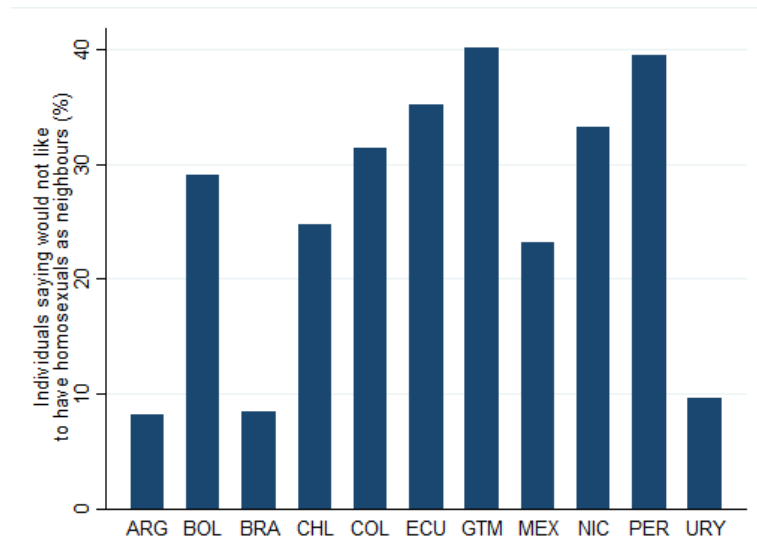


Notes: Data from the World Values Surveys between 2011 and 2020. Individuals were asked the following question: *"On this list are various groups of people. Could you identify any that you would not like to have as neighbors?"*. The figure shows the percentage of respondents choosing the option "homosexuals".

Assessing the extent of discrimination in the housing market is of particular interest not only because discrimination can be inherently unjust, but also because housing and neighborhoods are key determinants of individuals' opportunities (Chetty et al., 2016; Chetty and Hendren, 2018; Bergman et al., 2019; Chyn, 2018). Despite its relevance, causal evidence on discrimination against LGBTQ+ people in the housing market is restricted to a few countries in Europe and North America—e.g., Sweden (Ahmed and Ham-

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[1]For example, newspapers report discrimination against transgender people in the rental housing market in Buenos Aires, Argentina, during the COVID-19 pandemic (https://www.infobae.com/sociedad/2021/09/03/le-negaron-el-alquiler-porque-su-novia-es-trans-no-se-hace-por-el-tema-de-tu-pareja/).

marstedt, 2008; Ahmed et al., 2008), Germany (Mazziotta et al., 2015), Serbia (Koehler et al., 2018), Ireland (Ahuja and Lyons, 2019), Portugal (Gouveia et al., 2020), Canada (Lauster and Easterbrook, 2011), and the U.S. (Friedman et al., 2013; Levy et al., 2017; Murchie and Pang, 2018; Schwegman, 2018; Hellyer, 2021).

This paper aims to reduce this lack of knowledge by assessing the extent of discrimination against homosexual and transgender individuals in the rental housing markets in four Latin American countries: Argentina, Colombia, Ecuador, and Peru. To that end, we conducted a correspondence study (Bertrand and Mullainathan, 2004; Jowell and Prescott-Clarke, 1970; Riach and Rich, 1991) that allows us to examine interactions between property managers—mostly real estate agents—and fictitious couples engaged in rental searches in a major online rental housing platform.

In our experiment, fictitious couples send inquiries to property managers expressing interest in renting an advertised property and requesting a visit. To identify discriminatory behavior based on the renter's perceived gender identity or sexual orientation, we randomly vary the type of couple between heterosexual, gay male, and heterosexual couple where the female partner is a trans woman. In addition, we explore whether discriminatory behavior is consistent with models of statistical discrimination (Arrow, 1973; Phelps 1972) or taste-based discrimination (Becker, 1957). To this end, we randomly vary the amount of information observed to property managers on the renter's socioeconomic status (SES), from providing no information to signaling a high SES. Under a statistical discrimination framework, property managers would rely on the type of couple to infer their (unobserved) SES and vary their responses accordingly. If minorities are less likely to have a high SES, then the gaps in response rates should decrease or disappear after a high-SES signal is revealed. In this way, our experiment makes it possible not only to measure the extent of discrimination but also to study the underlying mechanisms.

The experiment was carried out in April 2022 in the metropolitan areas of the two largest cities of each country and targeted all property managers who had a property listed on the online platform. As a result, we contacted 3,624 property managers through the online forms available on the platform. We estimate the causal effects of perceived gender identity and sexual orientation on three outcomes—call-back rates, positive responses and invitations to visit the property—based on linear probability models that exploit the variation across property managers.

We find strong discrimination against trans couples compared to gay male and heterosexual couples. Specifically, when information about SES is not revealed (which we refer to as neutral SES), the call-back rates, positive-response rates and invitation rates for heterosexual and gay male couples are similar. However, trans couples receive 19% fewer responses, 27% fewer positive responses, and 23% fewer invitations relative to heterosexual couples. Importantly, we find no statistically significant effect of disclosing the high-SES signal on any outcome for heterosexual or gay male couples. However we do find large and positive effects of the high-SES signal for trans couples. Their response rate increases by 25%, the positive-response rate increases by 36% and the invitation rate

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increases by 29%, closing the gap relative to heterosexual or gay male couples with high SES.

Our results suggest the presence of discrimination against trans couples in the Latin American online rental housing market, which—at least in part—is due to statistical discrimination. Moreover, we find no evidence of heterosexual couples being favoured over gay male couples, nor evidence of discriminatory constraints consistent with statistical discrimination for gay male or heterosexual couples.

This paper contributes to the growing body of evidence on the economic effects of LGBTQ+ discrimination. To the best of our knowledge, this is the first study providing causal evidence from a large-scale field experiment on discrimination based on gender identity or sexual orientation in Latin American countries. While correspondence studies have been widely used in the last decades to measure gender- and race-based discrimination in the labor and housing markets in the United States, Canada, and Europe (for instance, Bertrand and Mullainathan, 2004; Ahmed and Hammarstedt, 2008; Bosch et al., 2010; Hanson and Hawley, 2011; Machelett, 2018), only a few studies have used this approach to measure discrimination against LGBTQ+ people. Evidence from the European and Canadian housing markets shows that gay male couples get less call-backs and invitations to further contacts and to showings than heterosexual couples (Ahmed and Hammarstedt, 2009; Ahmed and Hammarstedt, 2009; Ahuja and Lyons, 2019; Lauster and Easterbrook, 2011). In the U.S. housing markets, results are somewhat mixed. While Friedman et al. (2013), Levy et al. (2017), and Schwegman (2018) find that gay male couples experience less favorable treatment relative to heterosexual couples, Murchie and Pang (2018) finds the opposite, i.e., that gay male couples receive the most favorable treatment. Our paper contributes to this literature by providing the first piece of evidence to assess discrimination against gay couples in Latin American housing markets.

Moreover, this paper joins the very few causal studies that measure discrimination against transgender people based on audit or correspondence studies. To the best of our knowledge, no studies of this kind were conducted in developing countries. The only precedents that we are aware of are Levy et al. (2017), Langowski et al. (2018) and Fritzson (2021) that analyze discrimination against transgender people in the United States' and Sweden's housing markets, and Granberg et al. (2020) that studies discrimination against trans people in the Swedish labor market. For the case of the U.S. housing market, Levy et al. (2017) finds that housing providers offered transgender individuals fewer units than cisgender ones. From 33 in-person paired tests, Langowski et al. (2018) finds that transgender and gender non-conforming people received discriminatory treatment in the Metropolitan Boston rental housing market. Interestingly, based on a correspondence study contacting 800 landlords by email, Fritzson (2021) finds no significant discrimination against transgender individuals in Sweden but suggests that this may be due to the weakness of the transgender signal used in the experiment.[2] There is also concern about

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[2]The author signals gender identity with a name change by including the individual's former name in parentheses between the first and last name.

the external validity of the latter results since Sweden is one of the world's most progressive and LGBTQ+ friendly countries. Our study contributes to this literature by documenting for the first time the prevalence of discriminatory constraints against transgender people in Latin American housing markets.

Another contribution of our study is that it pioneers in providing evidence on the mechanisms underlying discrimination against LGBTQ+ people, which is possible due to the experiments' large scale. Our experimental design includes randomized information on the type of employment and collateral access to signal a couple with high SES. This information allows us to contrast different hypotheses about the type of discrimination. To the best of our knowledge, no other correspondence study assessing discrimination in the housing market based on gender identity or sexual orientation evaluates statistical versus taste-based discrimination. Murchie and Pang (2018) is the only exception. Their experimental design provides an indirect signal of SES: an email written formally and without grammatical errors is taken as a signal for high SES, whereas an email with grammar mistakes and casually worded is used to proxy low SES.

Finally, our results contribute to a better understanding of the type of barriers that LGBTQ+ people face in accessing housing services in the region to help design more inclusive programs and policies.

The rest of the paper is organized as follows. Section 2 presents an overview of the experimental design, implementation, and data collection. Section 3 describes the data and assesses the validity of the design. Section 4 presents and discusses the main results while Section 5 explores heterogeneities. Section 6 concludes.

## 2  Experimental design

We implemented a large-scale correspondence study in the online rental housing market in Argentina, Colombia, Ecuador, and Peru to test whether there exists discrimination against LGBTQ+ people. We also test how discrimination varies with additional information about the prospective renter.[3]

One of the main advantages of the correspondence study methodology is that it directly measures discrimination in specific markets and overcomes the lack of representative and unbiased data, which is prevalent in LGBTQ+ populations (Badgett et al., 2021). Correspondence studies also ensure more robust comparability across treatment groups than in prior studies—e.g., audit studies—guaranteeing that any observed differences are caused solely by the trait variation. Another advantage of the correspondence study approach is its low marginal cost, which allows for a larger sample size and scale. In our case, we can reach the four countries in Latin America that use the same online rental housing platform. Such a large sample not only provides more precise estimates but also allows us

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[3]The experiment was registered on the AEA RCT Registry as trial AEARCTR-0009012, and the human subjects protocol for this research design was approved by the Institutional Review Board (IRB) from Universidad del Rosario. IRB Approval Date: 01/19/2022. IRB Approval Number: CEI-UR 572-CS364.

to measure discrimination from more angles and, therefore, to test specific discrimination theories (Bertrand and Duflo, 2017).

In our experiment, fictitious couples send inquiries in response to online rental advertisements using customized scripts. In the scripts, we randomize the sexual orientation of couples or the gender identity of one of the partners while perfectly controlling all information about prospective renters observed by each property manager. We randomly vary the type of couple among the following three options: heterosexual, gay male, or heterosexual couple where the female partner is a transgender woman, which we refer to as a trans couple for simplicity. We also vary the information on the couple's SES, from not signaling SES to providing positive information—we inform that both partners are professionals with stable jobs and have rental collateral. This second variation helps distinguish the type of discrimination. Discrimination is mainly estimated by comparing the response rates for different types of couples and SES information disclosure.

The sample comes from a comprehensive database of listings and property managers that we constructed by scraping one of the largest online rental housing platforms based on the four countries under analysis. The experiment was carried out in April 2022, and the experimental design involved sending inquiries to property managers using the fillable forms available online. Each property manager received a single inquiry from a randomly assigned fictitious couple with a certain SES signal. We contacted 3,624 property managers and received 1,195 responses—i.e., an overall response rate of 33%. In the remainder of this section, we describe the salient aspects of the experiment.

## 2.1 Property managers

We collected information on all available listings and property managers from a major online rental housing platform in the four countries under analysis. We focused on apartments for rent in downtown and suburban areas in the four capital cities and the country's second-largest city. The cities included are Buenos Aires and Rosario in Argentina, Bogota and Medellin in Colombia, Quito and Guayaquil in Ecuador, and Lima and Arequipa in Peru.[4]

For each listing, we gathered detailed information on its characteristics: the heading of the advertisement and its publication date, the name of the property manager, the geographical location of the apartment, the number of rooms, bedrooms, bathrooms, and garages, the size in squared meters, and the rental cost per month. All this information was collected the night before the messages were sent.

We imposed several restrictions on the collected sample. First, we dropped the properties intended for professional or commercial use only, larger than 200 square meters, with more than four rooms, or published before July 1, 2021. Also, we kept only one

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[4]Table A.1 lists the districts that are included in the metropolitan areas of each city. We were not able to record the information corresponding to downtown Medellin. However, we collected information on its suburban districts, which include most property managers from metropolitan Medellin publishing on the online platform.

listing per property manager (the most recent one) to avoid contacting the same property manager more than once by each applicant.

Our final sample includes the 3,624 property managers that satisfy the above restrictions. Table A.3 reports the distribution of property managers in the final sample across countries. The sample size is among the largest in correspondence studies assessing discrimination against homosexual or transgender people in the housing market.[5]

## 2.2    Message design

The inquiries were sent using standard means used by any prospective renter. In our case, we sent customized scripts through a fillable form available for each listing on the online platform. We built a baseline script and varied it along two dimensions: the perceived type of couple and the SES signal disclosure. The baseline script expressed interest in renting the apartment and asked to arrange a visit. In the high-SES script, we additionally informed that the two partners are professionals with stable jobs and that they have collateral.

The property managers would infer the type of couple from the names of the two partners. The names appear in the message body and in the closing signature line. We used the most popular male and female names in each country, which are not likely to be identified with other potentially discriminated groups in Latin America. Table A.4 lists these first and last names. Partner 1 is the partner filling out the online form and sending the message. Partner 1 always uses a male name. His name is also observed in two additional fields submitted through the online form: the prospective renter's name and email address.

### 2.2.1    Script template

The message was written in Latin American Spanish (see Table A.5). Below we show the English version of the script template.

> *"Hello, my name is ${FILL_PARTNER_1}, together with my partner ${FILL_PARTNER_2} we are looking for a place to rent, and we are very interested in this property. ${FILL_SES_SIGNAL}. We would like to pay a visit soon, what day could we go? We look forward to your response, thank you very much.*
> *${FILL_PARTNER_1} and ${FILL_PARTNER_2}"*

We fill the text between "${}" in the template with specific randomized components. In FILL_PARTNER_1 and FILL_PARTNER_2 we use male or female names to suggest

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[5]Related papers for European countries are based on samples between 400 and 800 listings (Ahmed and Hammarstedt (2008) and Ahmed et al. (2008) for Sweden; Koehler et al. (2018) for Serbia; Ahuja and Lyons (2019) for Ireland; Gouveia et al. (2020) for Portugal). Lauster and Easterbrook (2011) sent inquiries to 1669 listings in Canada. Only Schwegman (2018) and Friedman et al. (2013) for the United States have much larger sample sizes of up to more than 6,000 listings. For a more general review of field experiments to identify discrimination in the housing market, see Table 2 in Bertrand and Duflo (2017).

different gender identities or sexual orientations of couples. In FILL_SES_SIGNAL we include a sentence with additional information to signal a high SES. Also, we created a second script version that provides the same information but slightly differently worded. The second panel of Table A.5 shows the second script in Spanish.[6]

### 2.2.2 Sexual orientation and gender identity variation

In the baseline script, FILL_PARTNER_1 is a male name and FILL_PARTNER_2 is a female name. Thus the couple signing the baseline script is likely to be perceived as heterosexual by the property manager. To build our second fictitious type of couple, we vary the couple's sexual orientation by using a male name for both partners, thus suggesting that it is a gay male couple. Finally, to build our fictitious trans couple, we vary the gender identity of the second partner. We do so by filling FILL_PARTNER_2 with a female name followed with the clarification "(she is trans)", so the property manager would perceive this couple heterosexual with a trans woman.

Notice that in the first version of the script the names appear in the message body and in the closing signature line, but in the second version of the script the names appear only in the closing signature line (see Table A.5). Although this difference could imply a weaker signal of the sexual orientation or gender identity in the latter, we show that our results are robust to the script version in the robustness analysis.

### 2.2.3 Socioeconomic status variation

In addition to varying perceived sexual orientation and gender identity, we also vary the information provided to signal socioeconomic status. In the baseline script, we leave the FILL_SES_SIGNAL component empty. Since no explicit information on SES is provided in the baseline script, the baseline couple would likely be perceived as heterosexual with an average socioeconomic level, which we refer to as neutral. To signal a high SES, we inform that both renters are professionals with stable jobs and have rental collateral.

## 2.3 Randomization

The randomization assignment of treatments to property managers was done within country and unconditionally on any characteristic. For each country, we assigned 1/3 of the property managers to be contacted by each type of couple—i.e., heterosexual, gay male, and trans couple. Next, within each type of couple, we randomly assigned the neutral or high-SES signal to 2/3 and 1/3 of the property managers, respectively.

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[6]The scripts are responsive to cultural and language differences across countries. For instance, the verb *rentar* stands for the English *to rent* in Colombia, while the other countries use the verb *alquilar*. See Table A.6 with the list of words that differ across countries. The scripts were tested in two pilots carried out in February and March 2022.

## 2.4 Implementation, data collection and primary outcomes

We contacted 3,624 property managers through the contact forms available on the online platform. Our inquiries were sent between April 19 and 20, from 10:30 AM to 5:30 PM UTC-3.

As specified in the pre-analysis plan, the time window for attaining a valid response was limited to seven days. Past this limit, the observations were classified as non-responses. Automatic responses were also classified as non-responses. Overall, we obtained 1,195 responses—i.e., an average response rate of 33%. Once the interaction with the property managers was completed, we matched the responses to the listing data, which identifies the treatment as well as characteristics of the apartment and property manager as described in Subsection 2.1.[7]

We focus on three outcomes of interest: (i) the probability of receiving a response or call-back rate, (ii) the probability of receiving a positive response or positive-response rate, and (iii) the probability of receiving an invitation to visit the property or invitation rate. Responses are classified as positive if property managers respond that the property is still available. If, in addition, they mention the possibility of visiting the property or ask the couple to continue the conversation by phone and provide a contact number, the positive response is in turn classified as an invitation.[8]

## 3 Final sample and design validation

Of the 3,624 observations in our sample, 2,410 (67%) correspond to neutral couples—i.e., couples not disclosing the high-SES signal—and 1,214 (33%) to high-SES couples. Table A.2 shows the distribution across couples and SES signals. Of the total inquiries, 2,000 correspond to Argentina, 801 to Colombia, 348 to Ecuador, and 475 to Peru. Column 1 in Table A.3 shows the number of inquiries per city.

Table 1 contains descriptive statistics of the sampled property managers and rental units. Exploration of the table confirms that the randomized components are effectively balanced across treatment groups within each country. For instance, about half of the inquiries we sent use script version 1 for each country and treatment group. More importantly, the table also verifies that property managers and rental unit characteristics are balanced across treatment groups within country, thus validating the experiment. For instance, all types of couples inquired about apartments of the same average price per room. The remaining apartment characteristic are the number of rooms and whether the apartment is located in the capital city or the country's second city. Regarding property managers, we have their size as proxied by the number of listings for each property manager or by an indicator of whether this number exceeds the sample median. Overall,

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[7]To minimize the likelihood of an agent holding unavailable a rental unit due to our request, we responded to all inquiry replies by mentioning that we were no longer interested in that listing.

[8]This classification was specified in the Pre-analysis Plan (AEARCTR-0009012) and was done by research assistants not knowledgeable about which treatment was used to contact each listing.

these characteristics are balanced across treatment groups in each country.

We received 1,195 responses out of 3,624 inquiries—i.e., an overall call-back rate of 33%. Most responses were positive. We received 1,036 responses confirming that the apartment was still available—i.e., an average positive-response rate of 29%—and 854 invitations—i.e., an average invitation rate of 24%. Table A.3 reports the number of responses, positive responses and invitations to visit the apartment by city.

Table 1: Descriptive statistics of randomization design, rental units and property managers

|  | Sexual orientation/gender identity treatment | Hetero | Gay | Trans | Hetero | Gay | Trans | p-value of |
|---|---|---|---|---|---|---|---|---|
|  | SES signal | Neutral (no signal) | | | High SES | | | equal means |
| ARG | Number of inquiries | 449 | 442 | 441 | 232 | 219 | 217 | |
|  | =1 if script #1 | 0.48 | 0.52 | 0.51 | 0.50 | 0.49 | 0.51 | 0.91 |
|  | =1 if male name #1 | 0.50 | 0.50 | 0.49 | 0.50 | 0.51 | 0.49 | 0.99 |
|  | =1 if rental unit located in country's capital | 0.39 | 0.40 | 0.36 | 0.36 | 0.40 | 0.36 | 0.77 |
|  | Average size of property managers | 4.25 | 4.32 | 4.55 | 4.53 | 4.28 | 4.54 | 0.96 |
|  | =1 if size above median | 0.50 | 0.52 | 0.54 | 0.53 | 0.56 | 0.54 | 0.65 |
|  | Average price per room | 23,734 | 21,614 | 22,038 | 22,775 | 23,307 | 21,746 | 0.49 |
|  | Average size of rental unit | 2.35 | 2.35 | 2.40 | 2.40 | 2.37 | 2.44 | 0.79 |
| COL | Number of inquiries | 179 | 177 | 174 | 91 | 91 | 89 | |
|  | =1 if script #1 | 0.56 | 0.44 | 0.55 | 0.47 | 0.47 | 0.48 | 0.18 |
|  | =1 if male name #1 | 0.51 | 0.51 | 0.51 | 0.51 | 0.51 | 0.52 | 0.99 |
|  | =1 if rental unit located in country's capital | 0.42 | 0.50 | 0.49 | 0.51 | 0.48 | 0.37 | 0.23 |
|  | Average size of property managers | 75.27 | 48.28 | 83.67 | 56.78 | 100.49 | 65.13 | 0.38 |
|  | =1 if size above median | 0.79 | 0.76 | 0.79 | 0.77 | 0.81 | 0.84 | 0.68 |
|  | Average price per room | 637,267 | 1,416,014 | 621,064 | 758,294 | 1,618,614 | 1,068,557 | 0.26 |
|  | Average size of rental unit | 3.40 | 3.51 | 3.50 | 3.33 | 3.42 | 3.44 | 0.46 |
| ECU | Number of inquiries | 77 | 78 | 78 | 39 | 39 | 37 | |
|  | =1 if script #1 | 0.62 | 0.45 | 0.45 | 0.56 | 0.41 | 0.51 | 0.14 |
|  | =1 if male name #1 | 0.49 | 0.50 | 0.50 | 0.49 | 0.49 | 0.49 | 0.99 |
|  | =1 if rental unit located in country's capital | 0.42 | 0.44 | 0.51 | 0.51 | 0.41 | 0.30 | 0.28 |
|  | Average size of property managers | 36.34 | 155.24 | 39.55 | 18.41 | 64.31 | 61.14 | 0.14 |
|  | =1 if size above median | 0.52 | 0.58 | 0.58 | 0.62 | 0.46 | 0.57 | 0.75 |
|  | Average price per room | 208 | 209 | 216 | 241 | 222 | 261 | 0.42 |
|  | Average size of rental unit | 3.17 | 2.91 | 3.21 | 2.95 | 2.92 | 2.81 | 0.08 |
| PER | Number of inquiries | 107 | 103 | 105 | 53 | 53 | 54 | |
|  | =1 if script #1 | 0.50 | 0.46 | 0.52 | 0.57 | 0.40 | 0.54 | 0.47 |
|  | =1 if male name #1 | 0.50 | 0.49 | 0.50 | 0.49 | 0.49 | 0.50 | 0.99 |
|  | =1 if rental unit located in country's capital | 0.54 | 0.66 | 0.58 | 0.62 | 0.70 | 0.70 | 0.21 |
|  | Average size of property managers | 12.07 | 12.83 | 12.66 | 8.42 | 9.08 | 8.06 | 0.44 |
|  | =1 if size above median | 0.59 | 0.59 | 0.69 | 0.68 | 0.62 | 0.56 | 0.48 |
|  | Average price per room | 492 | 668 | 464 | 464 | 765 | 522 | 0.55 |
|  | Average size of rental unit | 3.30 | 3.39 | 3.37 | 3.36 | 3.58 | 3.43 | 0.65 |

Notes: Male name #1 corresponds to Manuel, Carlos, Juan, and Alejandro in Argentina, Colombia, Ecuador, and Peru, respectively (as opposed to Pablo, Jose, Luis, and Daniel, respectively). The size of property managers is measured by the number of listings in the online platform, and the size of the rental unit is measured by the number of rooms. Average prices are measured in domestic currency units, namely Argentinean pesos, Colombian pesos, US dollars, and Mexican pesos, for Argentina, Colombia, Ecuador, and Peru, respectively. P-values correspond to the null hypothesis that means for all 6 groups are the same within country.

# 4 Main results

## 4.1 Do responses vary by sexual orientation or gender identity?

To measure discrimination based on gender identity and sexual orientation, we start by comparing the call-back rates and type of responses for the three types of couples in our baseline when no SES information is disclosed—i.e., the responses for neutral couples. Figure 2 shows these comparisons based on the 2,410 inquiries signed by neutral couples.

Figure 2: Call-back, positive response, and invitation rates when couples do not disclose the high-SES signal.

(a) Average rate



(b) Gap in the average rate relative to heterosexual couples
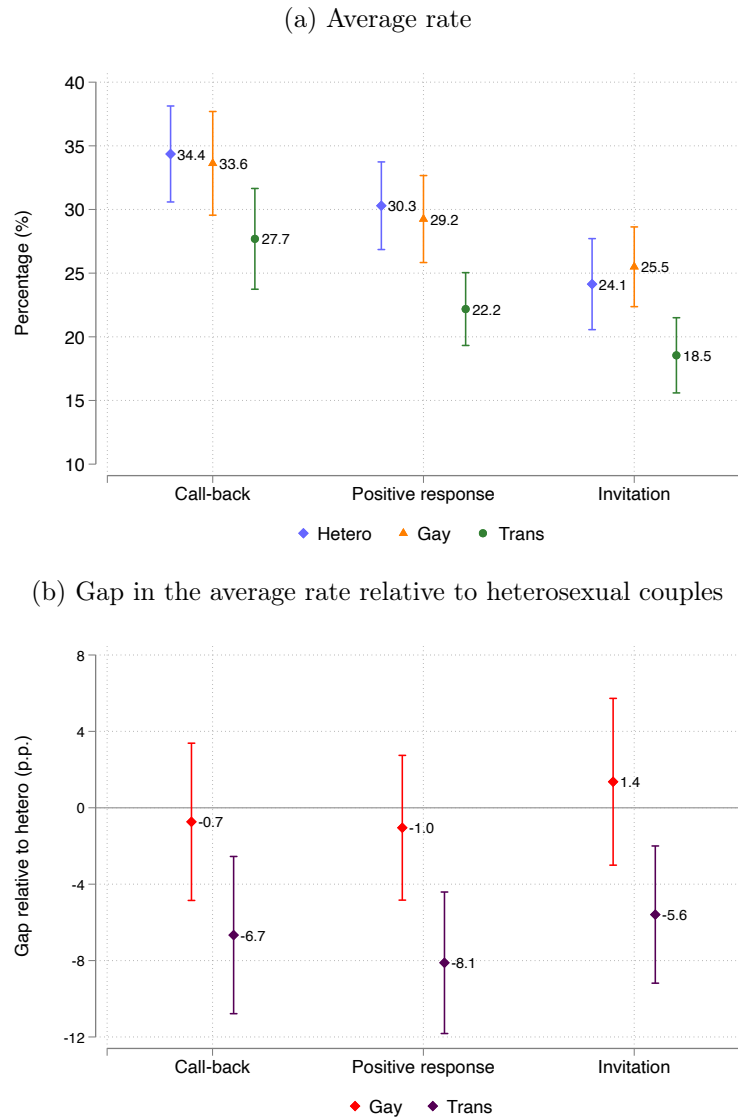


Note: Panel (a) shows average rates with the corresponding 95% confidence intervals for each type of couple when no SES information is disclosed. The 2,410 inquiries that correspond to neutral couples are taken as a base to compute the percentages. Panel (b) shows the gap in the previous rates relative to heterosexual couples.

For neutral heterosexual couples, the average call-back rate is 34.4%, and the positive-response rate is 30.3%. Neutral gay-male couples receive a fewer responses and positive responses—33.6% and 29.2%, respectively—although the gap relative to heterosexual couples is not statistically significant. In contrast, neutral trans couples receive significantly fewer responses than heterosexual or gay couples. The call-back rate for trans couples with no high-SES signal is 27.7%, and the positive-response rate is only 22.2%. These results imply a call-back rate differential of 19% and a positive-response rate differential of 27% lower for neutral trans couples relative to neutral heterosexual couples. The gaps between couples are similar when comparing invitation rates: there is no statistically significant difference between gay male and heterosexual couples, but trans couples receive significantly fewer invitations. The invitation rate for neutral trans couples is 23% lower relative to heterosexual couples. These results suggest the presence of large and statistically significant discriminatory behavior against trans couples but not against gay male couples.

## 4.2 The role of additional information: signaling high SES

Next, we explore whether our results are consistent with taste-based or statistical discrimination models. For example, differences in response rates or the response type across groups might be evidence of prejudice against LGBTQ+ people, corresponding to taste-based discrimination (Becker, 1957). But differences in responses may also arise from statistical discrimination (Arrow, 1973; Phelps, 1972). For instance, high-SES candidates might receive favorable treatment if property managers consider them more likely to timely afford rental costs than candidates with lower SES. Under statistical discrimination, if the share of high-SES candidates is perceived to be lower among couples in the minority group, then—absent additional information—property managers would reply less frequently o less positively to inquiries from minority couples. If a high-SES signal is provided, however, property managers should rely on this signal, potentially reducing reply gaps. To test whether the evidence is consistent with taste-based or statistical discrimination, we compare call-back rates, positive response rates, and invitation rates for the same type of couple with different SES signals—i.e., neutral couples versus high-SES couples. If statistical discrimination is prevalent, then the disclosure of the high-SES signal should reduce the gaps observed for neutral couples in Figure 2.

Figures 3 and 4 show how response rates change when couples signal a high SES. Heterosexual couples receive more responses, positive responses and invitations after disclosing a high-SES signal—the outcomes increase by 3.2, 3.0 and 2.4 percentage points, respectively—, but the changes are not statistically significant. For gay male couples, we find that the effect of disclosing a high-SES signal is virtually null for the three outcomes. In contrast, for trans couples, we find large and statistically significant differences when SES information is revealed. When trans couples signal a high SES, their call-back rates, positive-response rates and invitation rates increase respectively by 7, 8 and 5 percent-

age points, implying differentials of 25%, 36% and 29% relative to trans couples with no high-SES signal. These results suggest the presence of statistical discrimination against trans couples.

## 4.3   Conditional results from a probability model

Next, we explore whether the previous results hold in a multivariate framework by estimating the following linear probability model:

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\begin{aligned}
R_{ij} =& \alpha + \beta_g G_{ij} + \beta_t T_{ij} + \theta_h (H \times HighSES)_{ij} + \theta_g (G \times HighSES)_{ij} \\
& + \theta_t (T \times HighSES)_{ij} + \lambda_c + \lambda_{cap} + \phi_d + \eta M_j + \gamma A_{ij} + \mu_{ij}.
\end{aligned}
\tag{1}
$$

The dependent variable $R_{ij}$ is an indicator that takes the value 1 if couple $i$ receives a response/positive response/invitation from property manager $j$ and zero otherwise; $H_{ij}$, $G_{ij}$ and $T_{ij}$ are indicators that take the value 1 if couple $i$ is likely perceived by property manager $j$ as heterosexual, gay male or trans, respectively; $HighSES$ is an indicator that takes the value 1 if couple $i$ discloses a high-SES signal; $H \times HighSES$, $G \times HighSES$ and $T \times HighSES$ are interaction terms; $\lambda_c$ is a set of country dummy variables and $\lambda_{cap}$ is an indicator of capital city; $\phi_d$ is a set of experimental design controls (indicators of the script version and the name of the potential renter sending the inquiry, and the order of the inquiry sent by the specific email account); vector $M_j$ includes characteristics of the property manager (the size is proxied by the number of ads in the platform and whether it has branches or is a franchise) and vector $A_j$ controls for characteristics of the apartment (monthly rental price per room and number of rooms). Coefficients $\beta_g$ and $\beta_t$ in equation 1 capture the differential treatment given to neutral gay male and neutral trans couples, respectively, relative to neutral heterosexual couples. The coefficients $\theta_h$, $\theta_g$ and $\theta_t$ capture the differential effect of signaling a high SES within each type of couple.

Table 2 reports the estimated coefficients from equation 1 for the three outcomes of interest. The first five columns focus on the probability of receiving a response. Column 1 reports the unconditional results—i.e., the baseline model that only includes a constant, dummy variables for gay and trans couple, and the interactions between the high-SES dummy and the heterosexual, gay and trans indicators. These results coincide with those discussed in the previous subsections and shown in Figures 2, 3, and 4. Then, columns 2 to 5 gradually incorporate different controls: country and capital city dummies (column 2), experiment design controls (column 3), characteristics of the property manager (column 4), and characteristics of the rental unit (column 5). The following columns summarize the main results for the probability of receiving a positive response or an invitation based on the baseline specification (columns 6 and 8, respectively) and on the model that includes

Figure 3: Call-back, positive response, and invitation rates for neutral and high-SES couples.

(a) Average call-back rates



(b) Average positive-response rates



(c) Average invitation rates
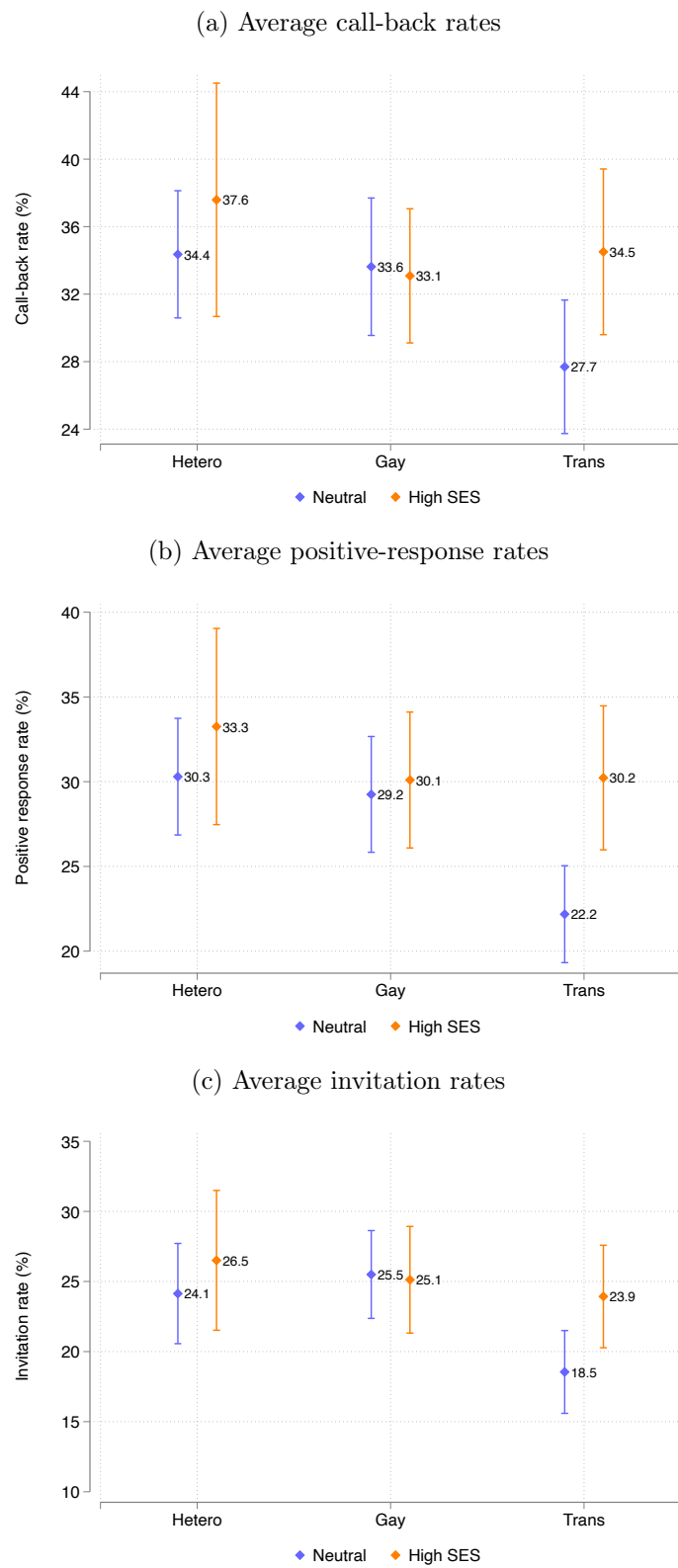


Note: Each panel shows the average rate with its 95% confidence intervals for each type of couple with and without the high-SES signal.

Figure 4: Gap in call-back, positive response, and invitation rates between neutral and high-SES couples.
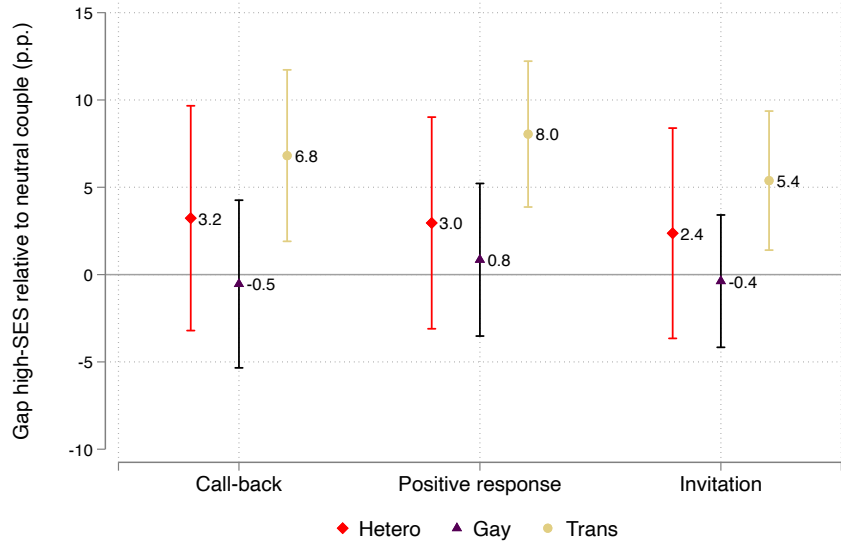


Note: The figure shows the gap and its 95% confidence interval in call-back rate, positive-response rate and invitation rate for each type of couple when the high-SES signal is provided.

all controls but rental unit characteristics (columns 7 and 9, respectively).[9]

The table shows that the previous—unconditional—results are robust across specifications. The main results are as follows. First, we find no statistically significant differences in call-back rates or the type of responses between neutral gay male and neutral heterosexual couples. Neutral gay male couples receive about one percentage point fewer responses and positive responses and 1.3 percentage points more invitations than heterosexual couples. However, these differences are small and never statistically significant. On the contrary, neutral trans couples receive much fewer responses, positive responses and invitations than the other couples. The gaps relative to neutral heterosexual couples are between 6 and 8 percentage points, which are highly statistically significant across specifications. When assessing the effect of a high-SES signal, we never find statistically significant effects for heterosexual or gay male couples. For instance, the call-back rate for heterosexual couples increases with the high-SES signal by between 3.2 and 1.3 percentage points depending on the specification, but this change is never statistically significant. The negative coefficients associated with the high-SES signal for gay couples is surprising, although these are generally close to zero and never statistically significant. In contrast to these results, we find large and statistically significant effects of signaling a high SES for trans couples. As a result, the gaps between trans and heterosexual couples disappear

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[9]We prefer the model with no rental unit controls to avoid missing observations, but results are robust across specifications.

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once the high-SES signal is revealed, as reported in the lower panel of Table 2.

As detailed in Appendix C , the results are robust to alternative exercises where we vary our sample definitions, valid response definitions, as well as including additional controls such as manager fixed effects.

Table 2: Probability of receiving a response, a positive response or an invitation.

| | Call-back rate | | | | | Positive response rate | | Invitation rate | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Gay | -0.735 | -0.782 | -0.800 | -0.803 | -0.863 | -1.046 | -1.114 | 1.362 | 1.326 |
| | (2.100) | (2.006) | (1.996) | (1.988) | (1.893) | (1.933) | (1.857) | (2.228) | (2.250) |
| Trans | -6.665*** | -6.708*** | -6.777*** | -6.743*** | -6.744*** | -8.115*** | -8.221*** | -5.592*** | -5.689*** |
| | (2.100) | (2.102) | (2.115) | (2.091) | (1.921) | (1.890) | (1.863) | (1.833) | (1.818) |
| Hetero x High SES | 3.231 | 3.146 | 1.390 | 1.464 | 1.633 | 2.957 | 1.325 | 2.368 | 1.278 |
| | (3.284) | (3.347) | (3.086) | (3.072) | (3.217) | (3.092) | (3.030) | (3.073) | (3.108) |
| Gay x High SES | -0.540 | -0.432 | -2.169 | -2.308 | -1.888 | 0.850 | -0.871 | -0.376 | -1.542 |
| | (2.450) | (2.372) | (2.643) | (2.692) | (2.812) | (2.229) | (2.395) | (1.933) | (1.957) |
| Trans x High SES | 6.815*** | 6.953*** | 5.187** | 5.114** | 5.199** | 8.046*** | 6.442*** | 5.383*** | 4.325** |
| | (2.505) | (2.336) | (2.536) | (2.424) | (2.517) | (2.131) | (2.124) | (2.031) | (1.990) |
| Constant | 34.360*** | 39.043*** | 43.826*** | 44.808*** | 40.378*** | 30.296*** | 38.476*** | 24.138*** | 29.940*** |
| | (1.920) | (2.239) | (3.017) | (3.489) | (4.635) | (1.753) | (2.982) | (1.821) | (3.306) |
| | | | | | | | | | |
| Country & capital city dummies | | Yes | Yes | Yes | Yes | | Yes | | Yes |
| Experiment design controls | | | Yes | Yes | Yes | | Yes | | Yes |
| Property manager charact. | | | | Yes | Yes | | Yes | | Yes |
| Rental unit charact. | | | | | Yes | | | | |
| | | | | | | | | | |
| Observations | 3,624 | 3,624 | 3,624 | 3,624 | 3,496 | 3,624 | 3,624 | 3,624 | 3,624 |
| Adjusted R squared | 0.003 | 0.022 | 0.023 | 0.024 | 0.026 | 0.005 | 0.020 | 0.003 | 0.015 |
| | | | | | | | | | |
| *Differences between couples:* | | | | | | | | | |
| Gay high - hetero high | -4.51 | -4.36 | -4.36 | -4.57 | -4.38 | -3.15 | -3.31 | -1.38 | -1.49 |
| | (3.93) | (3.95) | (3.91) | (3.90) | (3.85) | (3.67) | (3.57) | (2.92) | (2.75) |
| Trans high vs. hetero high | -3.08 | -2.90 | -2.98 | -3.09 | -3.18 | -3.03 | -3.10 | -2.58 | -2.64 |
| | (3.91) | (3.83) | (3.84) | (3.74) | (3.90) | (3.40) | (3.38) | (3.41) | (3.34) |

Notes: The table reports the OLS estimates of equation 1 based on the 3,624 inquiries. The dependent variable is an indicator that takes the value 1 if the couple receives a response (columns 1 to 5), a positive response (columns 6 and 7), or an invitation (columns 8 and 9) from a property manager and zero otherwise. Standard errors clustered by district in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The bottom panel shows the coefficients and standard errors of the difference in each outcome between gay and heterosexual couples, and between trans and heterosexual couples, when a high-SES signal is provided.

## 4.4 Discussion

In this subsection, we discuss some of the results that emerge from the experiment. A simple model is provided in Appendix B  to help illustrate the interpretation. The model represents a situation where individuals belonging to different groups seek to rent a property, and the property manager has to decide whether or not to respond to their inquiries. There is a minority group $A$—gay male and trans couples in our experiment—, and a majority group $B$—the heterosexual couples.

In our experiment, couples reveal their sexual orientation or gender identity, thus the model assumes that the property manager knows the group to which each candidate belongs. The property manager might have a distaste for minorities—represented in the model as a disutility $(d > 0)$. This disutility reflects taste-based discrimination. In addition, there is an average cost $(k > 0)$ associated with no high-SES couples. The prob-

ability of having a high SES might vary across types of couples, giving rise to statistical discrimination.

Although simple, this model has some testable implications to shed light on the mechanisms underlying our results. When couples do not disclose their socioeconomic status—the neutral couples in our experiment—, the difference in the call-back rate across types of couples captures the existence of discrimination. However, we cannot identify whether it is taste-based or statistical discrimination from this unique variation. But, if the gaps in call-back rates between different couple types vary when information about SES is revealed, that would be consistent with the existence of statistical discrimination, suggesting that property managers' beliefs about the distribution of SES differ across types of couples. For instance, property managers could expect that gay couples are on average poorer than heterosexual couples, given the existence of labor market discrimination against gay men, and therefore would be less inclined to reply to their inquiries.[10] On the contrary, it could be that property managers believe that gay male couples are on average richer than heterosexual couples due to the well-known gender earnings gap in favor of men.

In our experiment, we find no significant differences in response rates, positive-response rates or invitation rates between neutral gay couples and neutral heterosexual couples, consistent with absence of discrimination against gay men, at least at this stage of the housing search. We also do not find evidence of statistical discrimination against gay male couples since there are no significant changes in response rates after the high-SES signal is revealed.

Regarding trans couples, we find evidence of discrimination compared to heterosexual and gay male couples in the absence of information on socioeconomic status. As discussed previously, neutral trans couples receive 19% fewer responses, 27% fewer positive responses, and 23% fewer invitations than neutral heterosexual couples. Absent any other information, this gap could be due to taste-based or statistical discrimination. In the first case, the gap would arise from a distaste of the property manager for trans couples. In the second case, however, the gap would be the result of property managers' beliefs about trans couples' SES. For instance, as trans people are less likely to be employed and have higher poverty rates than otherwise similar cisgender individuals (Carpenter et al., 2022), absent socioeconomic information, property managers might assume that trans couples are less likely to be from a high SES. Even more, it may be that property managers fear that the apartment is used for some illegal activity if the renter is trans.[11] Therefore,

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[10]See for instance Neumark (2018), which surveys evidence on discrimination in the labor market against gays and lesbians coming from experimental research.

[11]Stereotypes usually link trans people to sex work. In Argentina, for instance, the public debate during the nineties gave rise to the construction of a political-social identity of the transvestite-trans collective closely related to sex work (Guerrero and Miranda, 2018). Usually the lack of access to formal employment tends to expose trans persons to dangerous working conditions, often forcing them to turn to sex work as a survival strategy (OEA, 2020). According to a survey on the trans population carried out in 2019 in the Buenos Aires Province (PBA, 2019), 41.7% of LGBTQ+ people engaged in sex work as their main source of income.

signaling high-SES might be particularly beneficial for this group.

The fact that the differential treatment against trans couples disappears when the high-SES signal is provided suggests that part—if not most—of the observed discrimination against trans couples is statistical.

# 5 Heterogeneity analysis

In this section, we study whether discrimination levels and their patterns vary across countries, with property manager characteristics or the rental unit. This analysis would allow us to assess which variables predict higher degrees of discrimination while providing a deeper understanding of the behaviors leading to the observed discrimination patterns. This section presents results on our main outcome: call-back rates. Results are similar for positive-response rates and invitation rates.

## 5.1 Does discrimination vary across countries?

Average call-back rates vary across countries: from 38% in Argentina, 31% in Ecuador and Peru, and only 22% in Colombia (Table A.3 reports these figures).[12]

Figure 5 shows the average call-back rates in each country for the different types of couples. These are unconditional call-back rates, similar to those in column 1 of Table 2. Table A.7 in the Appendix reports all estimated coefficients and the corresponding standard errors, and shows in Panel B that the results are robust to the inclusion of controls as in column 4 of Table 2.

First, we find the same pattern regarding discrimination against trans couples in all countries. Trans couples receive fewer responses than heterosexual couples, but the levels of discrimination differ. For instance, in Ecuador and Peru, trans couples receive 38% and 33% fewer responses than heterosexual couples. In Argentina, the gap is only 14% and the gap is 17% in Colombia, but it is not precisely estimated.

Another common pattern to the four countries is that discrimination against trans couples decreases or disappears with the high-SES signal. In other words, the sign of the $Trans \times HighSES$ coefficient is positive for all the countries, though there are differences in terms of magnitude and statistical significance. For instance, the effect is not statistically significant in Argentina or Peru.[13]

On the contrary, for gay couples, we find marked differences across countries. While we find no evidence of discrimination against neutral gay couples in none of the countries—the $Gay$ coefficients are very close to zero and not statistically significant—, we find heterogeneous effects of the high-SES signal. In Ecuador, for instance, the high-SES

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[12]The share of each country in our sample is unbalanced, so some results are more reliable than others. Of the 3,624 inquiries in our sample, 2000 (55%) correspond to Argentina, 801 (22%) to Colombia, 475 (13%) to Peru and 348 (less than 10%) to Ecuador. Also, the response rates are quite different across countries.

[13]However, the high-SES signal for trans couples does have a significant effect in Buenos Aires, which represents 95% of the sample for Argentina.

signal significantly increases the call-back rate for gay couples. In Colombia, the effect goes in the same direction but it is not statistically significant. In contrast, in Argentina and Peru, the coefficient associated with the interaction term $Gay \times HighSES$ is negative and also statistically significant for the former. This is a counterintuitive result in light of the theory we discussed at the end of Section 4 and requires further analysis beyond what our data can test.

Figure 5: Average call-back rates by country.
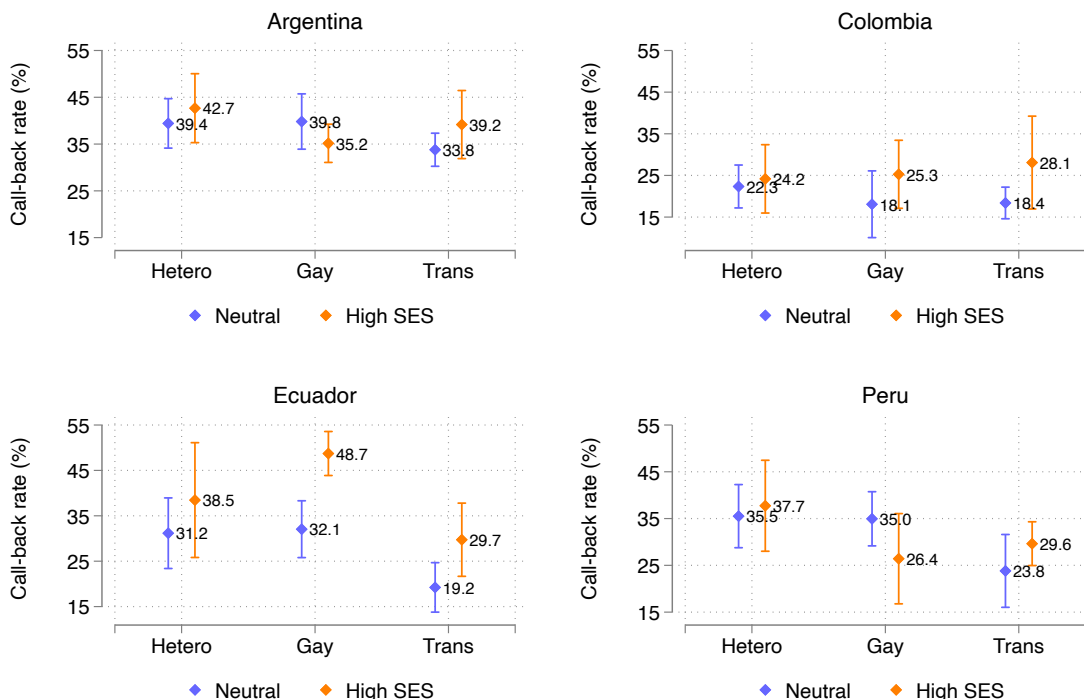


Note: Each panel shows average call-back rates with their 95% confidence intervals for each type of couple with and without the high-SES signal in each country.

## 5.2 Heterogeneity by type of property manager

Discrimination may vary depending on the type of property manager either, due to differences in tastes or because they have different perceptions or information about the characteristics of certain groups. Also, the motivation to rent the property, how they weigh different characteristics of potential tenants and even the emotional attachment to the property can be very different across different property managers.

To characterize property managers, we rely on proxies of their size that could also be associated with different organizational structures. The dimensions we consider are the following: (i) whether the number of ads of the property manager in the online platform

is below or above the sample median; (ii) whether the property manager has a single ad in the online platform; and (iii) whether the property manager has the same name as other property managers in different districts. We interpret that property managers with a single listing in the online platform are more likely to be private owners as opposed to real state agents or firms.[14] When different property managers share a common name we interpret it is a franchise or a multi-branch firm.

Smaller property managers—i.e., size below the median, private owner or not franchise—exhibit higher call-back rates but also higher discrimination (see columns 1 to 9 in Table A.8). Figure 6 shows the gaps in call-back rates between neutral trans (gay) couples and neutral heterosexual couples. The call-back rate differential for trans couples relative to heterosexual couples is somewhat wider for smaller property managers. For instance, private owners respond 25% less to trans couples than to heterosexual couples, while the gap is only 17% for real state agencies. Despite these differences, we find evidence of discrimination against trans couples for all types of property managers and the differences between property managers are not statistically significant. We also find for all types of property managers that the high-SES signal reduces or eliminates discrimination for trans couples (see Figure 7). The coefficients are always positive and in most cases highly statistically significant.

For gay couples and regardless of the type of property manager, we again find no evidence of discrimination. Also, we again find a negative effect on call-back rates when gay couples signal a high SES to property managers below the median size or private owners. Although the coefficients are not statistically significant, this counterintuitive result deserves further analysis.

## 5.3 The higher the demand, the greater the discrimination

We also look at how discrimination changes with the time elapsed since the property was first listed. The fact that a property remains in the platform after a certain period of time may mean that other properties were preferred or that the demand for that particular property is lower than expected. On the other hand, the demand could be higher for newer properties. Given everything else, profit-maximizing behavior would lead property managers to discriminate less the longer the property lasts on the platform. But causality may go in the opposite direction: when the property managers are more demanding—perhaps more discriminating—it may take longer to rent the property. In this case we should find greater discrimination the longer the property lasts on the platform.

To explore this issue, we split the sample between 'old' and 'new' listings. We define old listings as those that have been published on the platform for at least 24 days—the

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[14]We would like to compare the results between real estate companies and private owners, but this information is not available in the online platform. Based on similar listings in another online platform with extensive coverage in Argentina and Peru, we know that about 17% and 14%, respectively, correspond to private owners.

Figure 6: Heterogeneity in call-back rates by type of property manager, duration of listing, rental price and competition level.

(a) Gap in call-back rates between neutral trans and heterosexual couples.
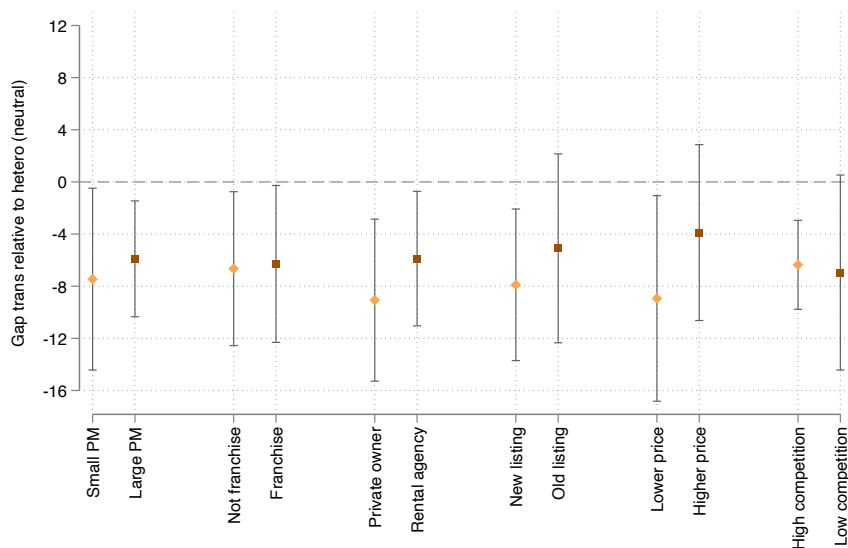


(b) Gap in call-back rates between neutral gay and heterosexual couples.
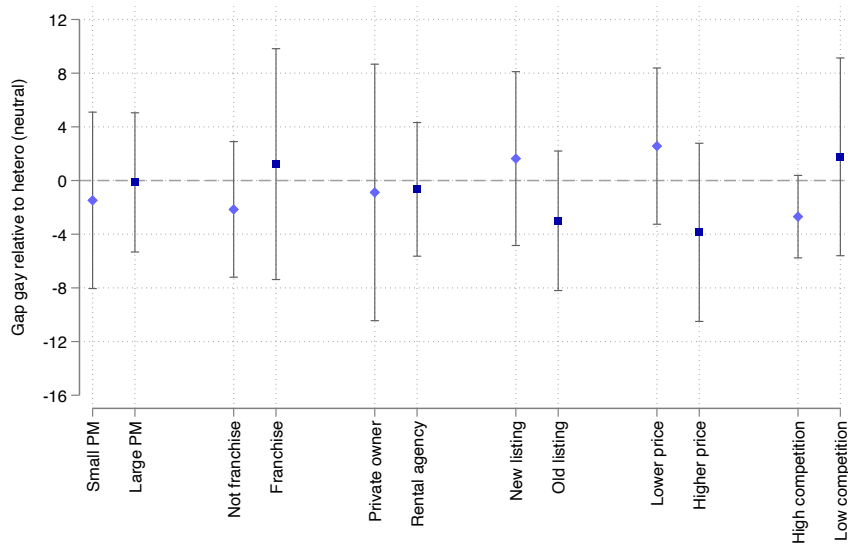


Note: Panels (a) and (b) show the the point estimate and the 95% confidence interval of the gap in call-back rate between gay and hetero couples and between trans and hetero couples, respectively, when no SES information is provided.

Figure 7: Heterogeneity in the effect of the high-SES signal by type of property manager, duration of listing, rental price and competition level.

(a) Gap between high-SES and neutral trans couples.



(b) Gap between high-SES and neutral gay couples.



(c) Gap between high-SES and neutral heterosexual couples.
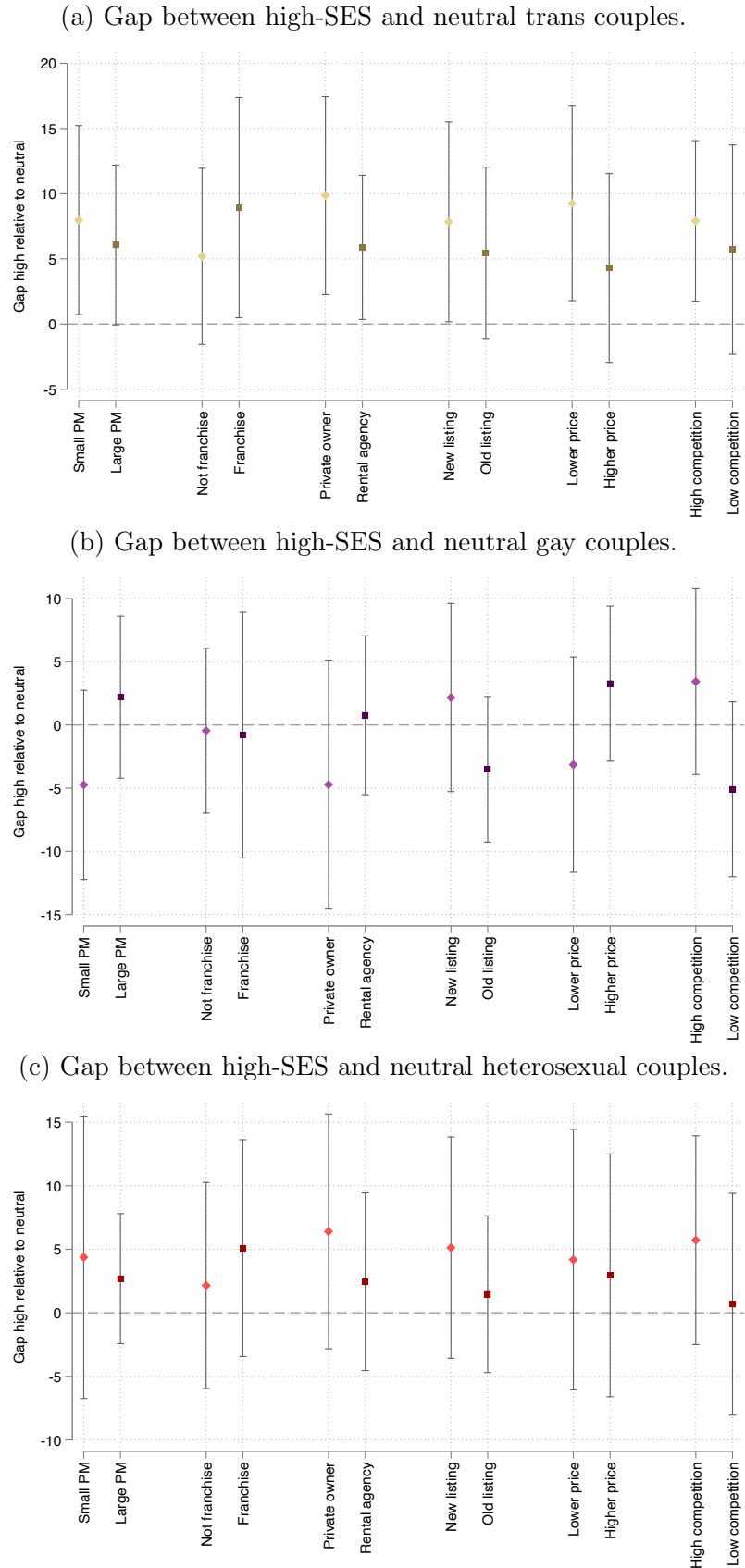


Note: Each panel shows the point estimate and the 95% confidence interval of the gap in call-back rate for each type of couple when the high-SES signal is provided relative to the case of no signal.

sample median—while new listings appeared in the platform within the last 23 days.[15]

We find that inquiries about new properties receive more responses than inquiries about the old ones—38% and 31%, respectively. However, discrimination is also higher for the new properties, at least discrimination against trans couples. The call-back rate for trans couples inquiring about new properties is significantly lower than for heterosexual couples. The gap disappears when trans couples signal a high SES (see Figures 6 and 7, and columns 10 to 12 in Table A.8). In other words, the $Trans$ and $Trans \times HighSES$ coefficients have a similar magnitude—almost 8 percentage points—but opposite signs—negative and positive, respectively—and both are highly statistically significant. In contrast, we find no evidence of discrimination against trans couples for inquiries regarding old properties. This suggests that property managers discriminate more when it comes to newer listings, which might be associated with expecting higher demand. If the cheapest properties are the first to be rented, this behavior would imply restrictions on the access of trans couples to the cheapest properties.

## 5.4 Heterogeneity by rental price

We next analyze how discrimination varies with the rental price per room. We split the sample into two groups: the high- and low-price groups depending on whether the price per room is above or below the average price per room in the corresponding district. We find large and statistically significant discrimination against trans couples asking about low-price properties but no statistically significant evidence of discrimination when they inquire about high-price properties (see Figure 6 and columns 13 to 15 in Table A.8). This result is linked to that discussed in the previous point and suggests that trans couples could suffer restrictions in accessing the best price opportunities.

## 5.5 Does competition affect discrimination?

We expect competition to reduce statistical discrimination. To explore this issue, we split the sample between property managers who were exposed to more or less competition within their districts. We take the number of listings published on the platform within district as a proxy for competition. We thus define the high- and low-competition groups depending on whether they belong to districts above or below the median number of listings.

We find no evidence that discrimination against neutral trans couples is affected by competition—the coefficients associated with the $Trans$ dummy are of similar magnitude and statistically significant for both groups (see Figure 6 and columns 16 to 18 in Table A.8). The lack of increased discrimination in less competitive districts is consistent with the lack of taste-based discrimination as predicted in Becker's model. Moreover, only property managers in the high-competition group reduce discrimination when trans couples signal a high SES (see Figure 7).

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[15]We find similar results when taking other thresholds, such as one month.

# 6 Conclusion

This paper assesses the extent of discrimination against homosexual and transgender individuals in the rental housing markets in four Latin American countries: Argentina, Colombia, Ecuador, and Peru. To that end, we conducted a large-scale correspondence study where fictitious couples send inquiries to property managers expressing interest in renting a property listed in an online platform.

To identify discriminatory behavior based on the renter's perceived gender identity or sexual orientation, we randomly vary the type of couple between heterosexual, gay male, and heterosexual couple where the female partner is a trans woman. In addition, we randomly assign a high-SES signal across couples to explore whether the evidence is consistent with taste-based or statistical discrimination.

Overall, we find strong discrimination against trans couples compared to gay male and heterosexual couples. Specifically, when information about SES is not revealed (which we refer to as neutral SES), the call-back rates, positive-response rates and invitation rates for heterosexual and gay male couples are similar. However, trans couples receive 19% fewer responses, 27% fewer positive responses, and 23% fewer invitations relative to heterosexual couples. Importantly, we find no statistically significant effect of disclosing the high-SES signal on any outcome for heterosexual or gay male couples. However, we do find large and positive effects of the high-SES signal for trans couples. Their response rate increases by 25%, the positive-response rate increases by 36% and the invitation rate increases by 29%, closing the gap relative to heterosexual or gay male couples with high SES.

These results suggest the presence of discrimination against trans couples in the Latin American online rental housing market, which—at least in part—is due to statistical discrimination. Moreover, we find no evidence of heterosexual couples being favored over gay male couples, nor evidence of discriminatory constraints consistent with statistical discrimination for gay male or heterosexual couples. There is an important consideration to these findings, as with all correspondence studies. We observe a first interaction with property managers and not the final rental outcome.

We also find that discrimination against trans couples intensifies in certain contexts. For instance, we find stronger evidence of statistical discrimination the higher the competition faced by property managers. Also, that property managers discriminate more when it comes to newer listings or to low-price properties, suggesting that trans couples could suffer restrictions in accessing the best price opportunities.

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# A Tables and figures

Table A.1: Districts included in the metropolitan area of the capital and second city of each country

| Argentina | Colombia | Ecuador | Peru |
|---|---|---|---|
| **Ciudad Autónoma de Buenos Aires** | **Bogotá** | **Quito** | **Lima** |
| Avellaneda | Bogotá | Amaguaña | Ate |
| Berazategui | Cajicá | Alangasí | Barranco |
| Ciudad Autónoma de Buenos Aires | Chía | Calderón | Breña |
| Esteban Echeverría | Cota | Conocoto | Carabayllo |
| Ezeiza | Facatativá | Cumbayá | Chaclacayo |
| Florencio Varela | Funza | Guayllabamba | Chorrillos |
| General San Martín | La Calera | Pomasqui | Comas |
| Hurlingham | Madrid | Puembo | Independencia |
| Ituzaingó | Mosquera | Quito | Jesús María |
| José C. Paz | Soacha | Rumipamba | La Molina |
| La Matanza | Sopó | San Antonio | La Victoria |
| Lanús | Tabio | Sangolquí | Lima |
| Lomas de Zamora | Tenjo | Tumbaco | Lince |
| Malvinas Argentinas | Tocancipá | **Guayaquil** | Los Olivos |
| Merlo | Zipaquirá | Durán | Lurigancho |
| Moreno | **Medellín*** | Guayaquil | Lurín |
| Morón | Barbosa | Samborondón | Magdalena del Mar |
| Quilmes | Bello | | Miraflores |
| San Fernando | Caldas | | Pucusana |
| San Isido | Copacabana | | Pueblo Libre |
| San Miguel | Envigado | | Puente Piedra |
| Tigre | Girardota | | Rímac |
| Tres de Febrero | Itagüí | | San Bartolo |
| Vicente López | La Estrella | | San Borja |
| **Rosario** | Sabaneta | | San Isidro |
| Fray Luis Beltrán | | | San Juan de Lurigancho |
| Funes | | | San Juan de Miraflores |
| Granadero Baigorria | | | San Luis |
| Roldán | | | San Martín de Porres |
| Rosario | | | San Miguel |
| | | | Santa Anita |
| | | | Santa María del Mar |
| | | | Santiago de Surco |
| | | | Surquillo |
| | | | **Arequipa** |
| | | | Alto Selva Alegre |
| | | | Arequipa |
| | | | Cayma |
| | | | Cerro Colorado |
| | | | José Luis Bustamante y Rivero |
| | | | Sachaca |
| | | | Yanahuara |

We were not able to record the information corresponding to downtown Medellin, but we were able to collect information on its suburban districts, which include most property managers from metropolitan Medellin publishing at the online platform.

Table A.2: Inquiries by type of couple and SES signal

|  | Heterosexual couple | Gay couple | Trans couple | Total |
|---|---|---|---|---|
| Neutral | 812 | 800 | 798 | 2,410 |
| High | 415 | 402 | 397 | 1,214 |
| Total | 1,227 | 1,202 | 1,195 | 3,624 |

Table A.3: Number of inquiries, responses, and positive responses per city

|  | Inquiries | Responses | Positive responses | Invitations to visit |
|---|---|---|---|---|
| **Total Argentina** | **2000** | **763** | **649** | **529** |
| Buenos Aires | 1894 | 733 | 621 | 503 |
| Rosario | 106 | 30 | 28 | 26 |
| **Total Colombia** | **801** | **174** | **157** | **122** |
| Bogota | 544 | 137 | 130 | 100 |
| Medellin | 257 | 37 | 27 | 22 |
| **Total Ecuador** | **348** | **109** | **101** | **90** |
| Quito | 179 | 61 | 56 | 52 |
| Guayaquil | 169 | 48 | 45 | 38 |
| **Total Peru** | **475** | **149** | **129** | **113** |
| Lima | 444 | 143 | 124 | 108 |
| Arequipa | 31 | 6 | 5 | 5 |
| **Total** | **3624** | **1195** | **1036** | **854** |

Notes: Medellin includes the suburban districts but not the downtown area of Medellin.

Table A.4: First and last names used in each country

|  | Country | | | |
|---|---|---|---|---|
|  | ARG | COL | ECU | PER |
| Male names partner 1 | Manuel | Carlos | Juan | Alejandro |
|  | Pablo | José | Luis | Daniel |
| Male names partner 2 | Juan | Carlos | Juan | David |
|  | Luis | José | Luis | Daniel |
|  | Manuel | Juan | Carlos | Alejandro |
|  | Pablo | Luis | José | Carlos |
| Female names partner 2 | María | María | María | María |
|  | Laura | Luz | Rosa | Laura |
|  | Florencia | Ana | Ana | Marta |
|  | Belén | Mónica | Diana | Cristina |
| Last names partner 1 | Rodríguez | Rodríguez | Zambrano | Flores |
|  | Gómez | González | García | Domínguez |

Source for Argentina: Registro Nacional de las Personas (RENAPER).
Source for Colombia: Registraduría Nacional de Estado Civil.
Source for Ecuador: Instituto Nacional de Estadística y Censos (INEC).
Source for Peru: Registro Nacional de Identificación y Estado Civil (RENIEC).

## Table A.5: Scripts in Spanish

| | Heterosexual / gay couple | Couple with trans woman |
|---|---|---|

### (a) Script version 1

| | Heterosexual / gay couple | Couple with trans woman |
|---|---|---|
| **Neutral** | Buenos días, mi nombre es $FILL_NAME, junto a mi pareja $FILL_COUPLE estamos buscando un lugar para $FILL_ALQUILAR y nos interesó mucho esta propiedad. Nos gustaría visitarla pronto, ¿qué día podríamos ir? Quedamos a la espera de su respuesta, muchas gracias. $FILL_NAME y $FILL_COUPLE Código $FILL_ID_INMUEBLE | Buenos días, mi nombre es $FILL_NAME, junto a mi pareja $FILL_COUPLE (ella es trans) estamos buscando un lugar para $FILL_ALQUILAR y nos interesó mucho esta propiedad. Nos gustaría visitarla pronto, ¿qué día podríamos ir? Quedamos a la espera de su respuesta, muchas gracias. $FILL_NAME y $FILL_COUPLE Código $FILL_ID_INMUEBLE |
| **High SES** | Buenos días, mi nombre es $FILL_NAME, junto a mi pareja $FILL_COUPLE estamos buscando un lugar para $FILL_ALQUILAR y nos interesó mucho esta propiedad. Ambos somos profesionales con empleos estables (podemos presentar $RECIBOS y $FILL_GARANTIA). Nos gustaría visitarla pronto, ¿qué día podríamos ir? Quedamos a la espera de su respuesta, muchas gracias. $FILL_NAME y $FILL_COUPLE Código $FILL_ID_INMUEBLE | Buenos días, mi nombre es $FILL_NAME, junto a mi pareja $FILL_COUPLE (ella es trans) estamos buscando un lugar para $FILL_ALQUILAR y nos interesó mucho esta propiedad. Ambos somos profesionales con empleos estables (podemos presentar $RECIBOS y $FILL_GARANTIA). Nos gustaría visitarla pronto, ¿qué día podríamos ir? Quedamos a la espera de su respuesta, muchas gracias. $FILL_NAME y $FILL_COUPLE Código $FILL_ID_INMUEBLE |

### (b) Script version 2

| | Heterosexual / gay couple | Couple with trans woman |
|---|---|---|
| **Neutral** | Hola, somos una pareja interesada en $FILL_ALQUILAR esta propiedad ¿Podemos hacer una visita esta semana o la próxima? Esperamos su respuesta. $FILL_NAME y $FILL_COUPLE Código $FILL_ID_INMUEBLE | Hola, somos una pareja interesada en $FILL_ALQUILAR esta propiedad. ¿Podemos hacer una visita esta semana o la próxima? Esperamos su respuesta. $FILL_NAME y $FILL_COUPLE (ella es trans) Código $FILL_ID_INMUEBLE |
| **High SES** | Hola, somos una pareja interesada en $FILL_ALQUILAR esta propiedad. Contamos con $FILL_GARANTIA, somos $FILL_UNIVERSITARIOS con empleos formales y buenos ingresos. ¿Podemos hacer una visita esta semana o la próxima? Esperamos su respuesta. $FILL_NAME y $FILL_COUPLE Código $FILL_ID_INMUEBLE | Hola, somos una pareja interesada en $FILL_ALQUILAR esta propiedad. Contamos con $FILL_GARANTIA, somos $FILL_UNIVERSITARIOS con empleos formales y buenos ingresos. ¿Podemos hacer una visita esta semana o la próxima? Esperamos su respuesta. $FILL_NAME y $FILL_COUPLE (ella es trans) Código $FILL_ID_INMUEBLE |

Note: The expressions $FILL_ALQUILAR (to rent), $FILL_GARANTIA (collateral), $FILL_RECIBOS (payslips), and $FILL_UNIVERSITARIOS (graduates) are to be filled with the corresponding expressions in Table A.6 for each country.

## Table A.6: Country-specific language used

| Pais | $FILL_ALQUILAR | $FILL_GARANTIA | $FILL_RECIBO | $FILL_UNIVERSITARIOS |
|---|---|---|---|---|
| ARG | alquilar | garantía | recibos de sueldo | graduados universitarios |
| COL | arrendar | garantes | comprobantes de nómina | graduados universitarios |
| ECU | alquilar | garantía | rol de pagos | graduados universitarios |
| PER | alquilar | aval | boletas de pago | egresados universitarios |

## Table A.7: Probability of receiving a response: heterogeneity by country

*Panel A. Unconditional*

| | ARG | COL | ECU | PER | Diff. ARG-COL | Diff. ARG-ECU | Diff. ARG-PER |
|---|---|---|---|---|---|---|---|
| Gay | 0.398 | -4.267 | 0.882 | -0.563 | 4.665 | -0.484 | 0.961 |
| | (2.997) | (3.567) | (5.261) | (4.278) | (4.606) | (5.922) | (4.717) |
| Trans | -5.634* | -3.956 | -11.94** | -11.70*** | -1.679 | 6.304 | 6.070 |
| | (3.289) | (3.142) | (4.567) | (3.622) | (4.501) | (5.516) | (4.875) |
| Hetero x High SES | 3.251 | 1.829 | 7.293 | 2.222 | 1.422 | -4.041 | 1.030 |
| | (5.417) | (4.204) | (4.901) | (6.146) | (6.791) | (7.196) | (7.845) |
| Gay x High SES | -4.659* | 7.196 | 16.67*** | -8.536 | -11.85** | -21.33*** | 3.877 |
| | (2.717) | (4.472) | (3.388) | (5.315) | (5.168) | (4.262) | (5.525) |
| Trans x High SES | 5.384 | 9.699* | 10.50** | 5.820 | -4.315 | -5.115 | -0.436 |
| | (3.262) | (5.195) | (3.684) | (3.524) | (6.059) | (4.835) | (4.972) |
| Constant | 39.42*** | 22.35*** | 31.17*** | 35.51*** | 17.07*** | 8.252* | 3.907 |
| | (2.690) | (2.622) | (3.899) | (3.413) | (3.717) | (4.642) | (4.294) |
| | | | | | | | |
| Observations | 2,000 | 801 | 348 | 475 | 2,801 | 2,348 | 2,475 |
| Adjusted R-squared | 0.004 | 0.007 | 0.034 | 0.012 | 0.029 | 0.010 | 0.008 |

*Panel B. Controls as in column (4) of Table 2*

| | ARG | COL | ECU | PER | Diff. ARG-COL | Diff. ARG-ECU | Diff. ARG-PER |
|---|---|---|---|---|---|---|---|
| Gay | 0.191 | -5.700 | 2.543 | -1.386 | 5.891 | -2.352 | 1.576 |
| | (2.950) | (3.549) | (5.537) | (4.430) | (4.559) | (6.101) | (4.866) |
| Trans | -5.975* | -4.112 | -10.41 | -12.29*** | -1.863 | 4.432 | 6.310 |
| | (3.299) | (3.208) | (5.920) | (3.190) | (4.552) | (6.597) | (4.565) |
| Hetero x High SES | 0.0235 | 1.208 | 6.467 | 1.049 | -1.175 | -6.450 | -1.030 |
| | (5.394) | (3.847) | (5.221) | (6.394) | (6.560) | (7.359) | (8.051) |
| Gay x High SES | -8.034** | 8.974* | 15.05*** | -9.149* | -17.00*** | -23.09*** | 1.111 |
| | (2.954) | (4.406) | (3.986) | (5.374) | (5.234) | (4.853) | (5.546) |
| Trans x High SES | 2.219 | 9.837 | 7.988* | 5.460* | -7.607 | -5.777 | -3.244 |
| | (3.176) | (5.727) | (3.841) | (2.944) | (6.450) | (4.849) | (4.567) |
| | | | | | | | |
| Observations | 2,000 | 801 | 348 | 475 | 2,801 | 2,348 | 2,475 |
| Adjusted R-squared | 0.011 | 0.034 | 0.055 | 0.020 | 0.040 | 0.019 | 0.015 |

Notes: The table reports the OLS estimates of equation 1 for different countries. Panel A reproduces the results from column 1 in Table 2 as a basis for comparison, while panel B controls for the same variables as in column 4 in Table 2. Each "Diff." column reports the estimate of the difference between the coefficients of the corresponding country and Argentina. Standard errors clustered by district in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.8: Probability of receiving a response: heterogeneity by type of property manager, duration of listing, competition and rental price

*Panel A. Unconditional*

|  | Small PM | Large PM | Diff. | Not franchise | Franchise | Diff. | Private owner | Rental agency | Diff. | New listing | Old listing | Diff. | Lower price | Higher price | Diff. | High competition | Low competition | Diff. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| Gay | -1.476 | -0.139 | 1.338 | -2.152 | 1.223 | 3.375 | -0.886 | -0.658 | 0.228 | 1.636 | -3 | -4.636 | 1.123 | -3.395 | -4.517 | -2.691 | 1.765 | 4.456 |
|  | (3.353) | (2.647) | (4.204) | (2.578) | (4.389) | (5.515) | (4.876) | (2.541) | (5.802) | (3.305) | (2.652) | (4.286) | (2.412) | (3.996) | (4.890) | (1.568) | (3.759) | (4.037) |
| Trans | -7.458** | -5.902** | 1.556 | -6.653** | -6.294** | 0.359 | -9.072*** | -5.884*** | 3.188 | -7.891*** | -5.097 | 2.794 | -8.040** | -3.402 | 4.638 | -6.360*** | -6.951* | -0.590 |
|  | (3.558) | (2.267) | (3.955) | (3.011) | (3.071) | (4.363) | (3.171) | (2.632) | (4.181) | (2.966) | (3.697) | (5.250) | (3.180) | (3.516) | (5.435) | (1.741) | (3.816) | (4.151) |
| Hetero x High SES | 4.370 | 2.695 | -1.675 | 2.152 | 5.091 | 2.938 | 6.404 | 2.449 | -3.955 | 5.131 | 1.462 | -3.670 | 4.251 | 2.659 | -1.592 | 5.720 | 0.677 | -5.042 |
|  | (5.667) | (2.609) | (5.289) | (4.136) | (4.356) | (5.088) | (4.713) | (3.566) | (4.725) | (4.443) | (3.143) | (4.316) | (4.348) | (5.066) | (6.126) | (4.188) | (4.450) | (5.941) |
| Gay x High SES | -4.739 | 2.193 | 6.932 | -0.452 | -0.809 | -0.358 | -4.716 | 0.763 | 5.479 | 2.167 | -3.508 | -5.674 | -1.665 | 2.795 | 4.460 | 3.427 | -5.091 | -8.518* |
|  | (3.817) | (3.269) | (5.027) | (3.324) | (4.955) | (6.510) | (5.022) | (3.205) | (6.546) | (3.797) | (2.938) | (4.756) | (3.393) | (3.915) | (5.181) | (3.750) | (3.531) | (4.989) |
| Trans x High SES | 7.979** | 6.066* | -1.912 | 5.196 | 8.929** | 3.734 | 9.853** | 5.886** | -3.968 | 7.837** | 5.469 | -2.368 | 8.816*** | 3.351 | -5.465 | 7.909** | 5.708 | -2.201 |
|  | (3.699) | (3.127) | (4.496) | (3.448) | (4.311) | (5.890) | (3.873) | (2.825) | (4.278) | (3.911) | (3.353) | (5.200) | (3.028) | (4.294) | (5.226) | (3.141) | (4.097) | (5.050) |
| Constant | 36.73*** | 32.62*** | -4.112 | 37.42*** | 29.91*** | -7.513** | 36.45*** | 33.66*** | -2.791 | 37.86*** | 30.75*** | -7.114** | 32.42*** | 36.96*** | 3.757 | 32.60*** | 36.14*** | 3.541 |
|  | (2.991) | (2.939) | (3.731) | (2.170) | (3.142) | (3.541) | (3.548) | (2.118) | (3.891) | (3.170) | (1.909) | (3.523) | (3.040) | (2.988) | (5.436) | (2.474) | (3.163) | (3.926) |
| Observations | 1,446 | 2,178 |  | 2,128 | 1,496 |  | 844 | 2,780 |  | 1,801 | 1,823 |  | 2,167 | 1,329 |  | 1,869 | 1,755 |  |
| Adjusted R-squared | 0.006 | 0.004 |  | 0.003 | 0.006 |  | 0.009 | 0.003 |  | 0.008 | 0.004 |  | 0.007 | 0.002 |  | 0.006 | 0.005 |  |

*Panel B. Controls as in column (4) of Table 2*

|  | Small PM | Large PM | Diff. | Not franchise | Franchise | Diff. | Private owner | Rental agency | Diff. | New listing | Old listing | Diff. | Lower price | Higher price | Diff. | High competition | Low competition | Diff. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
| Gay | -0.848 | -0.735 | 0.113 | -1.724 | 0.354 | 2.078 | 0.557 | -1.093 | -1.651 | 1.445 | -3.019 | -4.464 | 1.150 | -3.839 | -4.989 | -2.425 | 1.009 | 3.434 |
|  | (3.371) | (2.480) | (4.179) | (2.506) | (4.154) | (5.246) | (5.005) | (2.395) | (5.866) | (3.063) | (2.673) | (4.256) | (2.327) | (3.949) | (4.809) | (1.519) | (3.648) | (3.917) |
| Trans | -7.459** | -6.473*** | 0.986 | -6.782** | -6.657** | 0.125 | -8.850*** | -6.235** | 2.615 | -8.146*** | -5.213 | 2.934 | -8.011** | -4.058 | 3.954 | -6.090** | -7.700** | -1.610 |
|  | (3.611) | (2.308) | (4.021) | (3.016) | (3.062) | (4.325) | (3.031) | (2.606) | (3.855) | (2.828) | (3.784) | (5.289) | (3.062) | (3.651) | (5.447) | (1.763) | (3.779) | (4.125) |
| Hetero x High SES | 2.356 | 0.708 | -1.648 | 0.113 | 2.875 | 2.762 | 3.797 | 0.743 | -3.054 | 3.426 | -0.967 | -4.392 | 2.061 | 0.939 | -1.123 | 4.504 | -2.217 | -6.720 |
|  | (5.310) | (2.672) | (5.109) | (3.783) | (4.507) | (5.357) | (4.588) | (3.371) | (4.590) | (4.468) | (3.164) | (4.831) | (4.179) | (5.045) | (6.423) | (3.142) | (4.767) | (5.607) |
| Gay x High SES | -7.096* | 0.493 | 7.590 | -3.293 | 0.148 | 3.441 | -8.144 | -0.735 | 7.409 | 0.828 | -5.760* | -6.588 | -3.653 | 1.185 | 4.838 | 1.461 | -6.677* | -8.138 |
|  | (3.875) | (3.425) | (5.048) | (3.762) | (5.034) | (6.835) | (5.387) | (3.372) | (6.937) | (3.857) | (2.943) | (4.387) | (3.656) | (4.143) | (5.403) | (4.229) | (3.910) | (5.576) |
| Trans x High SES | 5.563 | 5.104* | -0.459 | 3.021 | 7.456* | 4.435 | 6.223 | 4.854* | -1.369 | 5.937* | 3.501 | -2.436 | 6.672** | 2.492 | -4.180 | 6.716 | 3.745 | -2.972 |
|  | (3.728) | (2.941) | (4.441) | (3.747) | (3.878) | (5.916) | (3.996) | (2.715) | (4.383) | (3.547) | (3.516) | (5.082) | (3.213) | (4.020) | (5.246) | (3.630) | (3.772) | (5.086) |
| Constant | 45.80*** | 46.82*** | -0.455 | 44.33*** | 47.53*** | 3.220 | 48.33*** | 44.43*** | -3.921 | 49.69*** | 41.61*** | -8.008 | 46.00*** | 44.11*** | 2.054 | 37.57*** | 45.84*** | 8.206 |
|  | (5.133) | (4.083) | (4.445) | (4.543) | (4.489) | (6.251) | (4.919) | (4.331) | (4.680) | (5.070) | (3.772) | (5.088) | (4.974) | (5.127) | (7.496) | (3.304) | (5.347) | (6.195) |
| Observations | 1,446 | 2,178 |  | 2,128 | 1,496 |  | 844 | 2,780 |  | 1,801 | 1,823 |  | 2,167 | 1,329 |  | 1,869 | 1,755 |  |
| Adjusted R-squared | 0.015 | 0.041 |  | 0.014 | 0.052 |  | 0.024 | 0.034 |  | 0.047 | 0.020 |  | 0.039 | 0.014 |  | 0.027 | 0.033 |  |

Notes: The table reports the OLS estimates of equation 1 for different groups. Panel A reproduces the results from column 1 in Table 2 as a basis for comparison, while panel B controls for the same variables as in column 4 in Table 2. Each "Diff." column reports the estimate of the difference between the coefficients of both groups. Standard errors clustered by district in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

# B    A simple model

In this section we introduce a simple model for the decision making of a property manager who is dealing with potential candidates for renting a property. We follow the intuition of discrimination models applied to labor markets (Neumark, 2018) or housing markets (Ewens et al., 2014). In particular, we are interested in understanding what drives the property manager to continue or not with the interaction with a certain candidate upon receiving an inquiry.

If she continues with the interaction, she obtains an expected return $v > 0$. This value $v$ captures the rent and additional cost not explicitly modeled. However, she also has a reservation value $s$ of not answering the message. This reservation value $s$ follows a distribution $F : [0, +\infty) \to [0, 1]$ and captures alternative scenarios at the moment of receiving the inquiry that are not linked with the potential candidate characteristics. The value of $s$ is higher if the property manager has already received many inquiries for the same property, she is dealing with multiple properties to rent, or the property is "hot" in the market. It is lower if the property owner is in a hurry to find a tenant or if the property has been listed for a while.

Consequently the property manager observes the expected return to continue with the potential candidate $v$, and chooses to continue with the interaction if $s \leq v$; i.e., the reservation value is lower than the expected return to continue. Ex-ante, a potential tenant anticipates that the property manager replies the inquiry with probability $Pr(s \leq v) = F(v)$.

With this decision making process in mind, we incorporate two sources of discrimination for candidates belonging to a minority group A. First, a taste-based discrimination. Suppose that the property manager assigns a valuation $v$ to a candidate belonging to a majority group $B$ and a valuation $v - d$ to a candidate belonging to a minority group $A$, then $d > 0$ stands for a dislike cost that generates the taste-based discrimination. The probability of replying is $F(v)$ for candidates belonging to group $B$ and $F(v - d)$ for candidates belonging to group $A$. The implication of this taste-based discrimination is that the probability of replying an inquiry is lower for a candidate in the minority group $A$, as $F(v - d) < F(v)$.

Second, we introduce statistical discrimination (we focus only on this source of discrimination in this paragraph). We assume that there are some tenants with low socioeconomic status that may generate some unexpected cost when renting a property. For instance, this cost may involve financial issues or problems with neighbors requiring an intervention from the owner. We assume there is an ex-ante expected cost $k > 0$ and a proportion $q$ of tenants associated with these cases. Consequently a candidate generates expected profits of $(v - k, v)$ with probability $(q, 1 - q)$ depending on the unknown characteristic of the tenant. Then the property manager anticipates an expected return $v - q\,k$. The statistical discrimination is generated when the proportion $q$ differs between candidates in groups $A$ and $B$, where we assume $q_A > q_B$. If $q_A > q_B$, $v - q_A\,k < v - q_B\,k$

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and, then, the probability of replying to an inquiry is lower for a candidate belonging to a minority group $A$ than for a candidate belonging to a majority group $B$.

Mixing both the taste-based and the statistical discrimination is simple. A candidate from group $A$ generates an expected return of $v - q_A\,k - d$ to the property manager, where a candidate from group $B$ generates an expected return $v - q_B\,k$. The probability of answering an inquiry from a candidate in group $A$ is lower than from a candidate in group $B$ because of the taste-based discrimination $d$ and the higher proportion of candidates with expected cost $k$ ($q_A > q_B$). For simplicity we assume that $v > k + d$.

In this environment we assume that majority-minority condition is revealed. Additionally, a signal about the socioeconomic status may be disclosed, implying that a candidate disclosing a signal will not incur in the cost $k$ regardless of whether she belongs to group $A$ or $B$. Instead, if the socioeconomic status is concealed, the cost $k$ may or may not exists (with probability $(q, 1 - q)$). Then, four cases are identified:

1. Minority group $A$ with signal: expected return $v - d$, receiving a reply with probability $F(v - d)$.

2. Minority group $A$ with no signal: expected return $v - q_A\,k - d$, receiving a reply with probability $F(v - q_A\,k - d)$.

3. Majority group $B$ with signal: expected return $v$, receiving a reply with probability $F(v)$.

4. Majority group $B$ with no signal: expected return $v - q_B\,k$, receiving a reply with probability $F(v - q_B\,k)$.

Under some assumptions, we can derive some conclusions comparing these scenarios:

- Corollary $i$: the difference in the probability of replying between cases 4 and 2 captures the existence of taste-based and/or statistical discrimination.

- Corollary $ii$: the difference in the probability of replying between cases 3 and 1 captures the existence mainly of taste-based discrimination.

Expanding this analysis to more than two groups is straightforward. For instance this paper relates three groups: a majority group of heterosexual couples with two minority groups: gay-male and transgender couples. However, there are some caveats to be considered in the extension. First, the effects of discrimination may not be the same among all minority groups; one group may be subject to statistical discrimination and the other may not reveal any type of discrimination (at least in the stage considered). Second, the signal may also have different impact or may convey different information depending on the group. That is, the high-SES signal may be stronger when disclosed by trans couples than gay male couples because, for instance, the stronger barriers faced by the former in the educational system and labor market.

# C Robustness analysis

In this appendix, we perform several exercises to assess the robustness of our main results. Table C.1 shows the robustness results regarding the probability of receiving a response. As a basis for comparison the first column replicates the specification in column 4 of Table 2—i.e., the model including all controls but the rental unit characteristics to avoid losing 128 observations. Tables C.2 and C.3 show similar exercises for the positive-response and invitation rates.

*Changing the geographic coverage of the sample.* In the first exercise, we explore whether our main results hold after changing the geographic coverage of the estimation sample. Therefore, we impose different restrictions to the estimation sample: (i) we keep only the capital city of each country with its suburban areas (column 2), (ii) we keep only the capital city without its suburban areas (column 3), and (iii) we keep only districts with at least one response (column 4). In all cases, our main results hold. The largest differences appear in column 3—only capital cities without suburban areas—where we are left with less than half of the original sample, although the general conclusions do not change. For example, the coefficient of the *Gay* dummy remains negative but becomes much larger in absolute value and statistically significant. This is the only specification for which we find evidence of discrimination against gay male couples.

*Changing definition of automatic responses.* Determining whether a response was automatic required an analysis of both the content and style of the response that was carried out by a team of research assistants. To rule out that our results depend on such a classification, we complement this classification and use the time elapsed between sending the message and receiving a response. When the response arrives in a time less than a certain threshold, it is also classified as automatic and, therefore, as an invalid response. Column 5 of the table shows the results for a 2-minute threshold. Our results are robust to this change, as well as to other alternative thresholds.

*Changing the time window for attaining valid responses.* The pre-analysis plan limits the time window for a valid response to seven days. In this exercise, we modify this limit. Columns 6 and 7 of the table show the results when the time window is set to two days or two weeks, respectively. In both cases our main results are not sensitive to these changes.

*Changing the script.* In columns 8 and 9, we evaluate the robustness of our results to the script version. The result of discrimination against trans couples holds under both scripts. This is very important since in script 1 could be perceived as having a stronger trans signal than in script 2.[16] For script 1 we also find a positive and significant effect of the high-SES signal not only for trans couples but also for heterosexual couples. Instead,

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[16]Remember that script 1 begins with *"Hello, my name is $ {FILL_PARTNER_1}, together with my partner ${FILL_PARTNER_2} (she is trans)"*, while script 2 signalled the trans signal only in the closing signature.

the high-SES signal from script 2 is weaker: the coefficients associated to the interaction terms are no statistically significant with script 2.

*Controlling for property managers fixed effects.* Our experiment randomizes treatments across property managers in each country. As a result, our sample is balanced in the observable characteristics of these property managers as shown in Table 1. Given randomization, we should not worry about the possibility that the unobservables are unbalanced. To have an additional control for these unobservables, we repeated the experiment by sending a second round of messages to the same property managers varying the type of couple or the SES signal. Although we also varied the script version between rounds, a caveat arises because receiving two similar inquires may seem suspicious to property managers thus affecting their responses. Despite this, we think there is value in showing these results as a robustness exercise.[17]

Based on the responses to the two rounds of messages, we estimate equation 1 adding property manager fixed effects and report the results in column 10 of Table C.1. Again, our main results still hold, although the statistical significance of the effect of the high-SES signal for trans couples is reduced.

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[17]The second round of messages took place in May 2022, two weeks after the first round. The randomization was conditional on the treatment received in the first round. For instance, we randomly assigned one of the remaining five treatments to property managers who received a first inquiry from a neutral-SES heterosexual couple. The property managers who received the first inquiry from gay male or transgender couples, received messages from heterosexual couples in the second round, half with a high-SES signal. Figure C.1 in Appendix A illustrates the randomization procedure and the resulting distribution of inquiries across treatments.

Table C.1: Robustness checks: probability of receiving a response

| | Col. 4 in Table 2 | Only capital city with suburban areas | Only capital city without suburban areas | Only districts with at least one response | A/R adjusted by delay (2 min.) | Responses received within 2 days | Responses received within 2 weeks | Script 1 | Script 2 | PM fixed effects |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Gay | -0.803 | -0.582 | -2.098** | -0.701 | -0.797 | 0.134 | -0.668 | -1.601 | -0.241 | -3.162 |
| | (1.988) | (2.058) | (0.439) | (2.015) | (2.038) | (2.135) | (2.044) | (2.781) | (2.846) | (3.078) |
| Trans | -6.743*** | -7.772*** | -6.245* | -6.799*** | -6.756*** | -6.175*** | -6.489*** | -8.136** | -5.228* | -6.686** |
| | (2.091) | (2.256) | (2.123) | (2.128) | (1.924) | (2.154) | (2.026) | (3.310) | (2.748) | (3.279) |
| Hetero x High SES | 1.464 | 0.961 | 5.769 | 1.656 | 0.615 | 1.664 | 1.416 | 6.222* | -3.757 | -1.816 |
| | (3.072) | (3.588) | (3.678) | (3.090) | (2.515) | (3.142) | (2.984) | (3.535) | (4.687) | (2.751) |
| Gay x High SES | -2.308 | -5.159* | -1.593 | -2.233 | -2.964 | -3.384 | -2.450 | 1.241 | -5.422 | -2.362 |
| | (2.692) | (2.854) | (3.959) | (2.727) | (2.940) | (2.558) | (2.754) | (4.801) | (4.305) | (4.370) |
| Trans x High SES | 5.114** | 5.696** | 6.711 | 5.101** | 4.432* | 5.931** | 4.333* | 7.166** | 2.766 | 4.023 |
| | (2.424) | (2.855) | (4.889) | (2.483) | (2.476) | (2.284) | (2.443) | (3.437) | (3.472) | (4.411) |
| Constant | 44.808*** | 47.476*** | 41.307*** | 44.884*** | 44.738*** | 42.127*** | 45.535*** | 45.30*** | 46.11*** | 36.269*** |
| | (3.489) | (3.000) | (2.584) | (3.477) | (3.304) | (3.660) | (3.499) | (4.464) | (4.782) | (3.501) |
| Country and capital city dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Experiment design controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Property manager characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 3,624 | 3,061 | 1,582 | 3,560 | 3,624 | 3,624 | 3,624 | 1,815 | 1,809 | 5,682 |
| Adjusted R squared | 0.024 | 0.017 | 0.012 | 0.022 | 0.022 | 0.025 | 0.025 | 0.043 | 0.019 | 0.400 |
| *Differences between couples:* | | | | | | | | | | |
| Gay high - hetero high | -4.57 | -6.70 | -9.46 | -4.59 | -4.38 | -4.91 | -4.53 | -6.58 | -1.91 | -3.71 |
| | (3.90) | (4.45) | (6.61) | (3.97) | (3.34) | (3.56) | (3.76) | (4.26) | (5.14) | (4.06) |
| Trans high vs. hetero high | -3.09 | -3.04 | -5.30 | -3.35 | -2.94 | -1.91 | -3.57 | -7.19 | 1.30 | -0.85 |
| | (3.74) | (3.94) | (6.25) | (3.80) | (3.50) | (3.69) | (3.72) | (5.84) | (5.01) | (4.17) |

Notes: The table reports the OLS estimates of equation 1 based on different restrictions/definitions of the original sample. The dependent variable is an indicator that takes the value 1 if the couple receives a response from a property manager and zero otherwise. Column 1 reproduces the results from column 4 in Table 2 as a basis for comparison. All specifications include the same set of controls as column 1. Column 10 reports the results from a property manager fixed effects model based on the two rounds of messages. Standard errors are clustered by district in parentheses, except for column 10 that clusters standard errors by property manager. *** p<0.01, ** p<0.05, * p<0.1.

Table C.2: Robustness checks: probability of receiving a positive response

| | Col. 7 in Table 2 | Only capital city with suburban areas | Only capital city without suburban areas | Only districts with at least one response | A/R adjusted by delay (2 min.) | Responses received within 2 days | Responses received within 2 weeks | Script 1 | Script 2 | PM fixed effects | Positive resp. (as % of responses) | Positive resp. (as % of responses) - RA FE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| Gay | -1.114 | -1.124 | -2.165* | -1.032 | -1.111 | -0.165 | -0.857 | -0.607 | -1.916 | -2.359 | -0.977 | -0.965 |
| | (1.857) | (1.922) | (0.708) | (1.886) | (1.901) | (1.934) | (1.890) | (2.432) | (2.715) | (3.124) | (1.958) | (1.953) |
| Trans | -8.221*** | -9.475*** | -8.198*** | -8.318*** | -8.237*** | -7.508*** | -7.838*** | -8.588*** | -7.896*** | -7.485** | -8.073** | -8.067** |
| | (1.863) | (1.884) | (1.153) | (1.898) | (1.792) | (1.959) | (1.864) | (2.845) | (2.662) | (3.319) | (3.330) | (3.322) |
| Hetero x High SES | 1.325 | 0.089 | 4.840 | 1.480 | 0.393 | 1.730 | 1.418 | 6.524* | -4.286 | -0.861 | 0.357 | 0.361 |
| | (3.030) | (3.578) | (3.373) | (3.057) | (2.548) | (3.319) | (2.936) | (3.721) | (4.366) | (2.778) | (2.880) | (2.881) |
| Gay x High SES | -0.871 | -3.426 | -0.166 | -0.770 | -1.620 | -1.748 | -1.256 | 1.458 | -2.860 | -1.245 | 2.685 | 2.694 |
| | (2.395) | (2.616) | (3.928) | (2.434) | (2.553) | (2.428) | (2.488) | (4.126) | (3.650) | (4.363) | (2.826) | (2.822) |
| Trans x High SES | 6.442*** | 6.783*** | 6.839* | 6.467*** | 5.425** | 6.825*** | 5.667*** | 6.022* | 6.668** | 5.278 | 7.061* | 7.083* |
| | (2.124) | (2.342) | (2.769) | (2.172) | (2.319) | (2.018) | (2.114) | (3.113) | (2.873) | (4.438) | (4.206) | (4.226) |
| Constant | 38.476*** | 41.379*** | 34.210*** | 38.535*** | 38.337*** | 36.457*** | 39.147*** | 38.10*** | 40.52*** | 34.085*** | 85.635*** | 85.759*** |
| | (2.982) | (2.729) | (1.883) | (2.952) | (2.813) | (3.156) | (2.991) | (3.871) | (3.361) | (3.603) | (2.626) | (2.722) |
| Country and capital city dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Experiment design controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Property manager characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| RA FE | | | | | | | | | | | | Yes |
| Observations | 3,624 | 3,061 | 1,582 | 3,560 | 3,624 | 3,624 | 3,624 | 1,815 | 1,809 | 5,682 | 1,195 | 1,195 |
| Adjusted R squared | 0.020 | 0.014 | 0.0093 | 0.019 | 0.018 | 0.022 | 0.020 | 0.034 | 0.017 | 0.350 | 0.010 | 0.009 |
| *Differences between couples:* | | | | | | | | | | | | |
| Gay high - hetero high | -3.31 | -4.64 | -7.17 | -3.28 | -3.12 | -3.64 | -3.53 | -5.67 | -0.49 | -2.74 | 1.35 | 1.37 |
| | (3.38) | (4.23) | (5.69) | (3.45) | (2.87) | (3.63) | (3.22) | (3.67) | (4.55) | (4.08) | (3.39) | (3.43) |
| Trans high vs. hetero high | -3.10 | -2.78 | -6.20 | -3.33 | -3.20 | -2.41 | -3.59 | -9.09 * | 3.06 | -1.35 | -1.37 | -1.35 |
| | (3.57) | (3.53) | (6.38) | (3.62) | (3.47) | (3.56) | (3.53) | (4.94) | (5.03) | (4.13) | (3.63) | (3.62) |

Notes: The table reports the OLS estimates of equation 1 based on different restrictions/definitions to the original sample. The dependent variable is an indicator that takes the value 1 if the couple receives a positive response from a property manager and zero otherwise. Column 1 reproduces the results from column 7 in Table 2 as a basis for comparison. All specifications in columns 2 to 12 include the same set of controls as column 1, and column 12 adds research assistant fixed effects. Column 10 reports the results from a property manager fixed effects model based on the two rounds of messages. Columns 1 to 10 measure positive responses as a share of inquiries sent, while columns 11 and 12 measure positive responses as a share of responses received. Standard errors clustered by district in parentheses, except for column 10 that clusters standard errors by property manager. *** p<0.01, ** p<0.05, * p<0.1.

Table C.3: Robustness checks: probability of an invitation

| | Col. 9 in Table 2 | Only capital city with suburban areas | Only capital city without suburban areas | Only districts with at least one response | A/R adjusted by delay (2 min.) | Responses received within 2 days | Responses received within 2 weeks | Script 1 | Script 2 | PM fixed effects | Positive resp. (as % of responses) | Positive resp. (as % of responses) - RA FE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| Gay | 1.326 | 1.038 | -0.240 | 1.449 | 1.321 | 2.266 | 1.461 | 0.484 | 1.963 | -2.255 | 5.500 | 5.546 |
| | (2.250) | (2.424) | (3.947) | (2.287) | (2.309) | (2.070) | (2.281) | (2.692) | (3.161) | (3.117) | (5.208) | (5.246) |
| Trans | -5.689*** | -6.796*** | -6.276* | -5.740*** | -5.710*** | -4.863** | -5.425*** | -7.648*** | -3.675 | -7.103** | -3.061 | -3.040 |
| | (1.818) | (1.945) | (2.093) | (1.855) | (1.768) | (1.874) | (1.786) | (2.732) | (2.351) | (3.285) | (3.222) | (3.224) |
| Hetero x High SES | 1.278 | 0.167 | 2.280 | 1.403 | 0.951 | 1.534 | 1.418 | 2.976 | -0.680 | -1.203 | 0.497 | 0.513 |
| | (3.108) | (3.616) | (5.885) | (3.147) | (2.781) | (3.304) | (2.979) | (3.333) | (4.518) | (2.757) | (5.275) | (5.312) |
| Gay x High SES | -1.542 | -4.152** | -0.208 | -1.495 | -1.895 | -1.827 | -1.751 | 1.812 | -4.473 | 0.195 | -0.593 | -0.556 |
| | (1.957) | (2.077) | (2.708) | (1.987) | (2.125) | (1.893) | (1.993) | (3.741) | (3.242) | (4.384) | (3.497) | (3.511) |
| Trans x High SES | 4.325** | 4.680** | 5.720** | 4.312** | 4.219** | 4.694** | 3.723* | 5.654* | 2.835 | 5.751 | 2.587 | 2.671 |
| | (1.990) | (2.151) | (1.569) | (2.027) | (1.947) | (1.874) | (2.002) | (3.239) | (2.906) | (4.322) | (5.921) | (5.923) |
| Constant | 29.940*** | 32.190*** | 24.932*** | 29.974*** | 29.396*** | 27.953*** | 30.529*** | 30.76*** | 31.04*** | 28.861*** | 66.160*** | 66.632*** |
| | (3.306) | (3.554) | (3.804) | (3.251) | (3.182) | (3.422) | (3.184) | (3.580) | (3.933) | (3.533) | (5.104) | (5.176) |
| Country and capital city dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Experiment design controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Property manager characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| RA FE | | | | | | | | | | | | Yes |
| Observations | 3,624 | 3,061 | 1,582 | 3,560 | 3,624 | 3,624 | 3,624 | 1,815 | 1,809 | 5,682 | 1,195 | 1,195 |
| Adjusted R squared | 0.015 | 0.010 | 0.005 | 0.015 | 0.015 | 0.016 | 0.016 | 0.027 | 0.015 | 0.308 | 0.005 | 0.004 |
| *Differences between couples:* | | | | | | | | | | | | |
| Gay high - hetero high | -1.49 | -3.28 | -2.73 | -1.45 | -1.52 | -1.09 | -1.71 | -0.68 | -1.83 | -0.86 | 4.41 | 4.48 |
| | (3.34) | (3.43) | (6.38) | (3.42) | (3.27) | (2.76) | (3.26) | (3.16) | (3.72) | (4.15) | (4.38) | (5.40) |
| Trans high vs. hetero high | -2.64 | -2.28 | -2.84 | -2.83 | -2.44 | -1.70 | -3.12 | -4.97 | -0.16 | -0.15 | -0.97 | -0.88 |
| | (2.75) | (3.11) | (5.24) | (2.80) | (2.85) | (3.39) | (2.74) | (4.55) | (4.14) | (3.99) | (5.43) | (4.32) |

Notes: The table reports the OLS estimates of equation 1 based on different restrictions/definitions to the original sample. The dependent variable is an indicator that takes the value 1 if the couple receives an invitation to visit the apartment and zero otherwise. Column 1 reproduces the results from column 9 in Table 2 as a basis for comparison. All specifications in columns 2 to 12 include the same set of controls as column 1, and column 12 adds research assistant fixed effects. Column 10 reports the results from a property manager fixed effects model based on the two rounds of messages. Columns 1 to 10 measure invitations as a share of inquiries sent, while columns 11 and 12 measure invitations as a share of responses received. Standard errors clustered by district in parentheses, except for column 10 that clusters standard errors by property manager. *** p<0.01, ** p<0.05, * p<0.1.

Figure C.1: Randomization components

| Round 1 | | Round 2 | | |
|---|---|---|---|---|
| **Script** | **% Sample** | **Script** | **Share within treatment in round 1** | **% Sample** |
| | | Baseline + high SES | 25.00% | 5.56% |
| | | Baseline + gay couple + high SES | 18.75% | 4.17% |
| Baseline message | 22% | Baseline + couple with trans women + high SES | 18.75% | 4.17% |
| | | Baseline + gay couple | 18.75% | 4.17% |
| | | Baseline + couple with trans women | 18.75% | 4.17% |
| | | Baseline | 25.00% | 2.78% |
| | | Baseline + gay couple | 18.75% | 2.08% |
| Baseline + high SES | 11% | Baseline + couple with trans women | 18.75% | 2.08% |
| | | Baseline + gay couple + high SES | 18.75% | 2.08% |
| | | Baseline + with trans women + high SES | 18.75% | 2.08% |
| Baseline + gay couple | 22% | Baseline | 50.00% | 11.11% |
| | | Baseline + high SES | 50.00% | 11.11% |
| Baseline + gay couple + high | 11% | Baseline | 50.00% | 5.56% |
| | | Baseline + high SES | 50.00% | 5.56% |
| Baseline + couple with trans women | 22% | Baseline | 50.00% | 11.11% |
| | | Baseline + high SES | 50.00% | 11.11% |
| Baseline + couple with trans women + high SES | 11% | Baseline | 50.00% | 5.56% |
| | | Baseline + high SES | 50.00% | 5.56% |