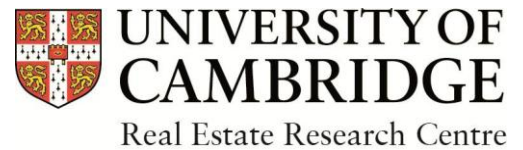


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Title: Good Jobs, Good Tenants?
Field Evidence of Racial and Gender Discrimination in the UK's Housing Market

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Good Jobs, Good Tenants?
Field Evidence of Racial and Gender Discrimination in the UK's Housing Market

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Abstract:

Housing discrimination hinders labour mobility and economic equality. The level of housing discrimination has not been significantly reduced over recent decades, with notable issues in less diverse countries, especially former colonial powers. We studied London's rental housing market, where ethnic minorities face barriers and housing is unaffordable. An analytical framework based on the taste-based and statistical discrimination theory was developed to investigate the nature of housing discrimination. Blue-collar and white-collar employment information was included in the correspondence test to differentiate between taste-based and statistical discrimination. Our findings indicate UK's racial discrimination is primarily taste-based, and providing job information doesn't bridge the racial gap. Addressing this requires government and societal efforts, emphasizing inclusive urban policies that influence how individuals perceive and interact with different ethnicities.

Keywords: labour mobility, housing decisions, gender and racial discrimination, ethnic minority, correspondence test

JEL Classifications: D63, J15, J16, R30

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Good Jobs, Good Tenants?

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Abstract:

Housing discrimination hinders labour mobility and economic equality. The level of housing discrimination has not been significantly reduced over recent decades, with notable issues in less diverse countries, especially former colonial powers. We studied London's rental housing market, where ethnic minorities face barriers and housing is unaffordable. An analytical framework based on the taste-based and statistical discrimination theory was developed to investigate the nature of housing discrimination. Blue-collar and white-collar employment information was included in the correspondence test to differentiate between taste-based and statistical discrimination. Our findings indicate UK's racial discrimination is primarily taste-based, and providing job information doesn't bridge the racial gap. Addressing this requires government and societal efforts, emphasizing inclusive urban policies that influence how individuals perceive and interact with different ethnicities.

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1. Introduction

Access to housing is recognised as a universal human right by the United Nations. Discrimination in the housing market may create economic inefficiencies and unjust individual outcomes. From an economic perspective, housing discrimination can hinder the free mobility of human labour, land, capital, and entrepreneurship, thus reducing economic efficiency (Boeri *et al.* 2015; Bakens *et al.* 2022). On a personal level, facing discrimination when trying to access housing can adversely impact health, family life, education, and employment opportunities (Korver-Glenn 2018; Christensen, Sarmiento-Barbieri & Timmins 2022; Christensen & Timmins 2022). Therefore, accurately measuring and proactively countering housing discrimination is crucial to upholding human rights and fostering individual and economic well-being.

Previous studies have shown that discrimination based on ethnic background and gender is prevalent in rental housing markets, where ethnic minorities are discriminated against and female applicants are favoured (Flage 2018; Auspurg, Schneck & Thiel 2020; Gusciute, Muhlau & Layte 2022). Legislation and education have reduced the incidence and magnitude of housing discrimination in the US (Quillian, Lee & Honore 2020). Behavioural interventions and training programmes have also been developed to address this issue (Bao 2023a; Ghekiere *et al.* 2023). However, the most blatant forms of housing discrimination, such as refusing property viewings, persist, especially in former colonial powers like the UK and France, and in communities with limited ethnic diversity (Bao 2023b). Discrimination is rooted deeply in

colonial history (Bano & Nadeem 2018), evolves with social dynamics (Verhaeghe & Ghekiere 2021), and is constitutive of organizations (Ray 2019). It is a moving target on an ever-changing landscape that requires constant and vigilant monitoring.

This study investigates racial and gender discrimination in London's housing market, where ethnic minorities encounter significant barriers. We conducted correspondence tests with fictitious profiles of five ethnicities: White British, Indian, Nigerian, Chinese, and Polish. Blue-collar and white-collar employment information was included in email inquiries to facilitate the detection of statistical and taste-based discrimination.

We found that ethnic discrimination is prevalent in London's rental housing market. British applicants were treated more favourably by letting agents in terms of receiving a positive response than all four ethnic minority groups. Second, there is evidence of gender discrimination in London's rental housing market, where British females received the highest proportion of responses, and Nigerian and Indian men were the least likely to receive a response. Racial discrimination in London appears predominantly taste-based. While providing additional information did enhance response rates, the improvement was consistent across all ethnic groups, including the White British demographic. As such, supplying additional data did not significantly reduce the racial disparity between the White British and ethnic minority groups. This discrimination, being taste-based, isn't mitigated simply by showcasing a renter's financial capability.

This study contributes to the literature by providing empirical evidence from the UK, a region deeply influenced by its colonial past and where housing discrimination has not been extensively examined (Bao 2023b). Knowledge of the underlying motivations of discrimination is vital for designing effective policy interventions. While statistical discrimination is based on information asymmetry and a rational assessment of probabilities, taste-based discrimination is rooted in irrational biases and personal preferences. Our results suggest that racial discrimination in the UK is primarily taste-based, and hence complex and difficult to eliminate. As emphasized in our literature review, ethnically diverse societies tend to display less prejudice towards ethnic minorities. Hence, fostering diverse communities and promoting inclusive societal norms are imperative. Encouraging individuals to provide information or mandating certain disclosures on listing platforms might assist, but they are unlikely to offer a complete solution.

This paper proceeds as follows. Section 2 presents a comprehensive literature review. Section 3 describes the analytical framework. The design and execution of the field experiment are detailed in Section 4. Section 5 provides and evaluates the experiment's findings. Section 6 draws conclusions.

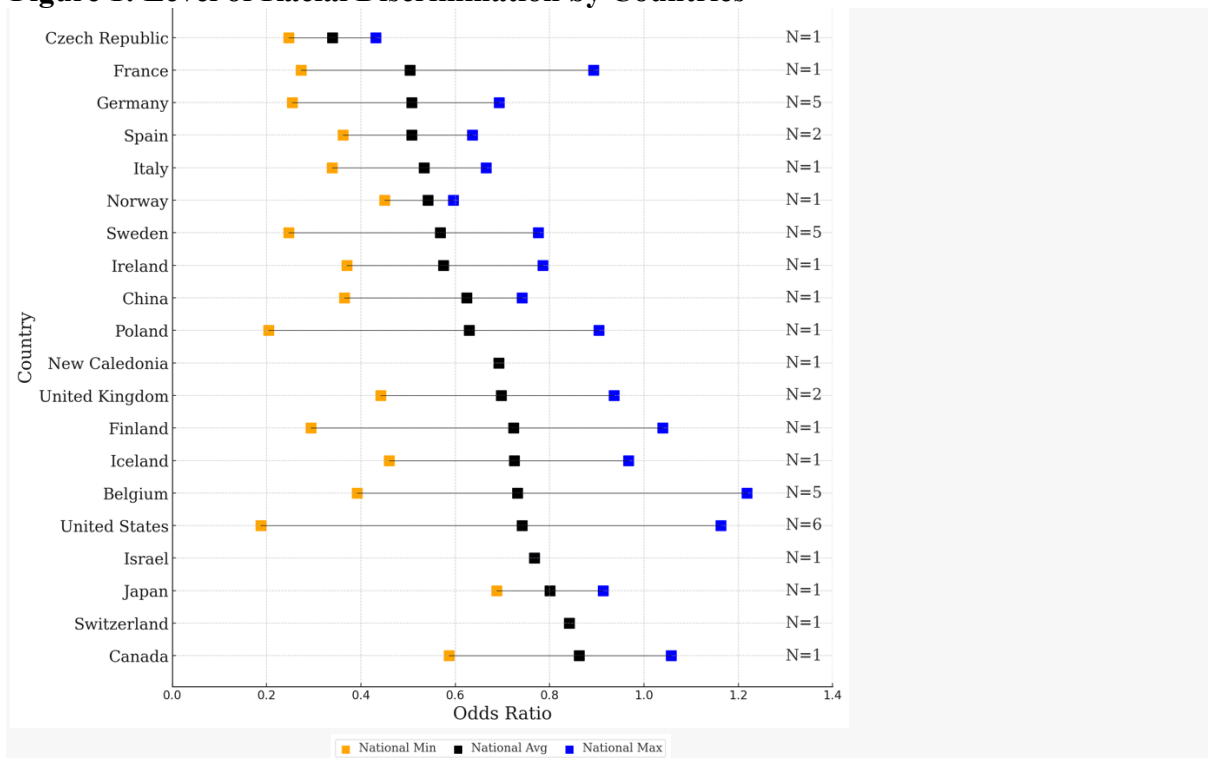
2. Literature review

The correspondence test (Jowell & Prescottclarke 1970) has been widely adopted to detect discrimination. Fictitious names are created to indicate hypothetical applicants' gender

and ethnic background. Researchers send inquiries with these names to landlords and real estate agents by email and record the proportion of positive responses as a measurement of discrimination. We summarised 40 correspondence tests of housing discrimination between 2003 and 2019². These studies draw evidence from 20 countries in Asia, Europe, and North America. The distribution of papers among these geographic countries can be found in Figure 1 below. 30, or 75%, of the 40 correspondence tests reviewed were conducted in the EU.

The response rate varies greatly between these countries because of many factors such as housing market conditions at the time and cultural norms regarding emails. Hence, the convention is to use the odds ratio of receiving responses between ethnic minority groups and their minority counterparts to facilitate direct comparisons across studies. When the odds ratio is less than one, racial discrimination is identified. The average odds ratio of the 40 studies is 0.64, which means ethnic minority groups' odds of receiving positive responses to their housing inquiries is 36% lower than that of their majority counterparts. Figure 1 also reports the distribution of odds ratios within and between countries. Except for a few exceptions, the odds ratios are well below one in most countries. There is robust and consistent evidence of racial discrimination in the housing market.

Figure 1: Level of Racial Discrimination by Countries

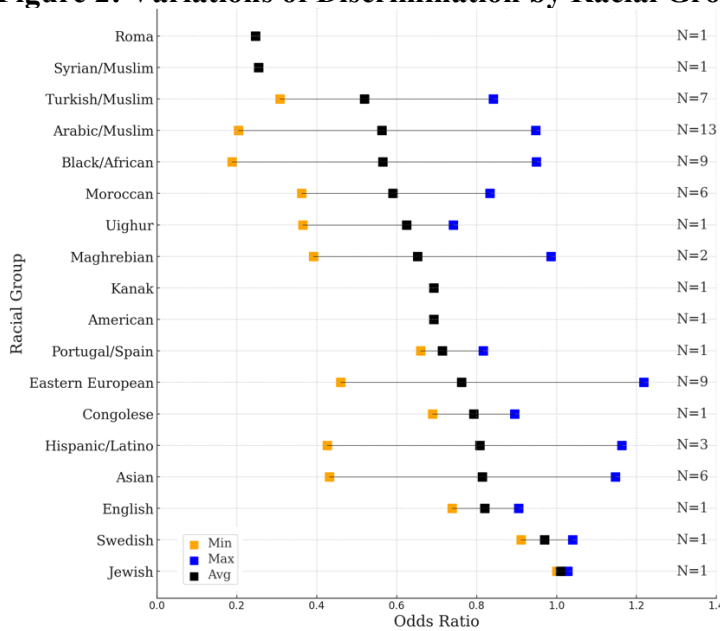


Note: Odds ratios are calculated against the ethnic majority in the corresponding study area. For example, 'English' is a minority group and 'Polish' is the majority in the study in Poland. The opposite is true in studies in the UK. 'N' is the number of studies for each country. Only the national average is shown for countries with one estimate available.

² The full list of papers can be found in Table A1 in the Appendix.

The definition of ethnic minority groups is country-specific. For example, Swedish is the minority in Finland (Öblom & Antfolk 2017), but the majority in Sweden (Ahmed & Hammarstedt 2008; Ahmed, Andersson & Hammarstedt 2010; Bengtsson, Iverman & Hinnerich 2012; Carlsson & Eriksson 2014; Molla, Rhawi & Lampi 2022). We group the 40 studies into 18 ethnic minority groups and illustrate their odds ratio in Figure 2. The discrimination against Muslims and Blacks is significantly higher than other groups.

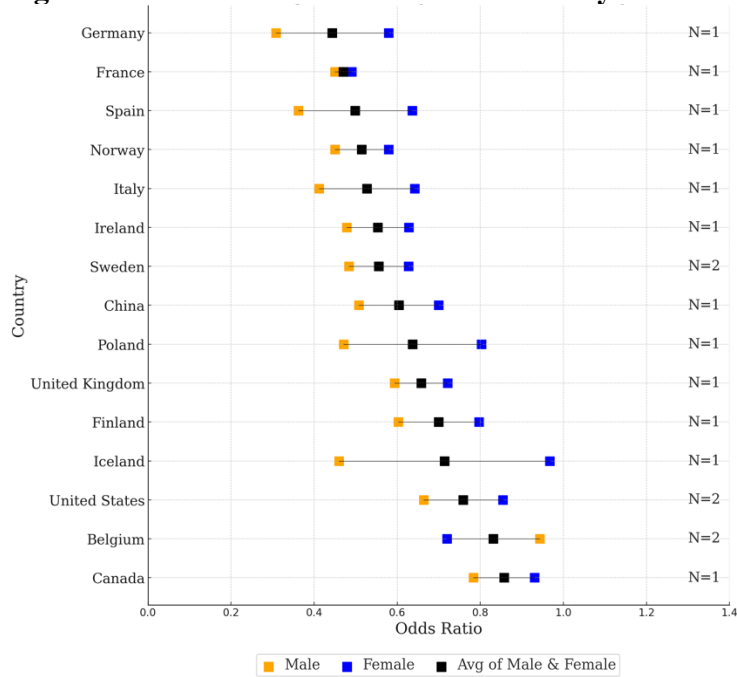
Figure 2: Variations of Discrimination by Racial Group



Note: Odds ratios are calculated against the female ethnic majority in the corresponding study area. 'N' is the number of studies for each country. Only the national average is shown for countries with one estimate available. Some of the odds ratios are above 1.0 because the response rate of the female majority group is well below the male group (i.e., there is discrimination against females in general).

Not all these 40 studies considered gender discrimination in their correspondence tests. Some researchers created fictitious profiles for male applicants only in their imperial designs (see, for instance, Hanson & Hawley 2011; Molla, Rhawi & Lampi 2022). There are 18 of the 40 studies that recorded responses for male and female applicants separately. This allows the identification of gender discrimination in the housing market. As shown in Figure 3, there is a general preference for female tenants, with the only exception in Belgium. Studies in France suggest that the average gender gap for five ethnic minority groups is negligible (Acolin, Bostic & Painter 2016). However, the gender gap is striking in some of the studies. For example, in Iceland, Polish males' odds ratio of getting responses from landlords is 0.46, which is well below the 0.94 odds ratio of female Polish renters (Björnsson, Kopsch & Zoega 2018). The opposite is true in Belgium, where Polish males were favoured over female applicants from both the majority and the ethnic minority groups (Ghekiere, Martiniello & Verhaeghe 2023). Similar to racial discrimination, the nature and magnitude of gender discrimination is complex. Future racial discrimination studies need to consider gender discrimination in research designs.

Figure 3: Level of Gender Discrimination by Countries



We also explore the role of research design and implementation strategies in determining the variations of gender and racial discrimination among these studies. To better understand the nature of racial discrimination, we further classify the 18 ethnic minority groups listed in Figure 2 into three broad categories: *Graylined*, *Colonial*, and *Foreign*. The term *Graylined* refers to groups that face more ambiguous or subtle biases, often because of their association with significant, often adverse, historical, or contemporary events, such as the 9/11 terrorist attack and the Holocaust. The term is inspired by 'Redlined', referencing discriminatory practices in mortgage lending, with *Graylined* capturing a more nuanced form of bias. For example, renters with Arabic/Muslim (see, for instance, Antfolk, Szala & Oblom 2019; Moritz & Manger 2022) or more religious Jewish names (Sansani 2019) received substantially fewer responses to their rental inquiries. The *Colonial* group is closely related to the legacy of colonialism, typified by discrimination against Blacks in the UK (Carlsson & Eriksson 2015) and indigenous Kanaks in New Caledonia (Bunel *et al.* 2019). The *Foreign* group includes immigrants or foreigners who consistently face discrimination in housing markets (Bartos *et al.* 2016; Murchie & Pang 2018; Martiniello & Verhaeghe 2023). Summary statistics of these three racial group identifiers are given in Table 1.

Odds ratios from the 40 studies were regressed on the variables listed in Table 1 and the results are reported in the same table. Model (1) uses the subsample with male or gender-neutral names in correspondent tests. The *Foreign* ethnic group and 'Non-gender' (i.e., studies with male-only or gender-neutral designs) are omitted as the reference categories. Model (2) uses the subsample with separate male and female renter profiles. The *Foreign* ethnic group and 'Female' are omitted as the reference categories.

We draw three conclusions from this exercise. Firstly, gender discrimination against male renters is significant in the housing market. Model (2) suggests that male renters' odds

ratio is 0.1843 points lower than their female counterparts. Gender profiles are necessary in housing discrimination studies, as evident from the insignificant coefficient estimate of *Male* and the low R square in Model (1) where male-only or gender-neutral names were used in correspondence tests.

Second, some ethnic minority groups face greater levels of discrimination than others. The average odds ratio for the '*Foreign*' group is 0.79, meaning that on average renters with foreign names are less likely to receive responses to their housing inquiries than the majority group. Model 2 suggests that Blacks or Africans face the worst discrimination, with an odds ratio of 0.2983 lower than the '*Foreign*' group. The '*Graylined*' group, which includes Muslims from foreign countries, has an odds ratio of 0.1915 lower than the '*Foreign*' group. Both coefficient estimates are statistically significant and of non-negligible size. Therefore, a multi-ethnic research design is necessary to understand the complexity of racial discrimination in culturally diversified study areas.

Third, correspondence test results are not significantly affected by the sample size of the study and the population size of the study area. It also does not matter whether the study is conducted nationwide or concentrated on one or several major cities of a country. On the other hand, when variations among landlords and agents were not controlled by a within-subject design (i.e., multiple inquiries were sent to the same landlords or agents), the odds ratio might be overestimated. This is evident from the negative and significant coefficient estimate of '*Within*', showing that on average odds ratio estimate from within-subject designs is 0.1678 lower. Therefore, a within-subject design should be adopted in correspondence tests to remove the potential confounding effect from landlords and property agents.

Finally, the social and cultural background of the study area has a significant influence on the results. Ethnically diversified places, indicated by a high Ethnic Fractionalization score in our study, treat minority groups much more fairly. Landlords in the old colonial powers, such as the UK, France, and Spain, are more discriminatory. It is worth noting the relatively small number of studies from the old colonial powers: only 11% of the odds ratio estimates or five out of the 40 studies are from these three countries. Empirical evidence is sparse in areas where racial discrimination is more serious.

In conclusion, future housing discrimination studies should explore the '*Colonial*' and '*Graylined*' groups further, given the significant level of discrimination experienced by these groups. More empirical evidence is needed from former colonial powers because of the influence of colonial history on racial perceptions. Additionally, consistently incorporating gendered profiles in correspondence tests will shed light on the intersectionality of racial and gender discrimination. Moreover, to eliminate potential confounding effects and obtain more accurate results, researchers should adopt a within-subject design, sending multiple inquiries to the same landlords or agents.

Table 1: Variable definitions, descriptive statistics, and regression results

Variable	Model 1	Model 2	Mean	Std. Dev.	Min	Max	Variable Definition
Odds ratio (Dependent variable)		--	0.66	0.22	0.19	1.22	Odds ratio of receiving a response from landlord against the ethnic majority group
Colonial	-0.2417***	-0.2983**	0.18	0.38	0	1	=1 if Black or African and 0 otherwise
Graylined	-0.2312***	-0.1915***	0.50	0.50	0	1	=1 if Muslim or Jewish background and 0 otherwise.
Foreign (Omitted as the reference)		--	0.34	0.48	0	1	=1 if immigrants (e.g., Eastern European or Asian) and 0 otherwise.
Female (Omitted as the reference in Models 2)		--	0.26	0.44	0	1	= 1 if female and 0 otherwise
Male	-0.0743	-0.1843***	0.39	0.49	0	1	= 1 if male and 0 otherwise
Non-gender (Omitted as the reference in Models 1)			0.36	0.48	0	1	= 1 if male-only or gender-neutral names were used and 0 otherwise
Colonial × Male		0.0689	--	--	--	--	Interaction term between Colonial and Male
Graylined × Male		-0.0147	--	--	--	--	Interaction term between Graylined and Male
Year	0.009	0.0180***	2015	4.58	2003	2021	Year when data were collected
Sample size	0.0089	-0.0557	0.74	1.10	0.08	7.15	Sample size in 1000
Within	-0.0492	-0.1678***	0.41	0.49	0	1.00	=1 if more than one email was sent to the same landlord/property and 0 otherwise.
Ethnic Fractionalization	0.2913	0.4930***	0.28	0.22	0.01	0.71	Measurement of ethnic diversity. The probability of two individuals drawn randomly from the country's groups are not from the same ethnic group, as defined and estimated in Alesina <i>et al.</i> (2003).
City	-0.0282	0.0315	0.51	0.50	0	1	=1 if the study was conducted in a single city and 0 otherwise.
Colony	-0.0121	-0.1663***	0.11	0.32	0.00	1.00	=1 if the study was conducted in the UK, France, Portugal and Spain, and 0 otherwise
Population	0.015	0.0006	2.16	4.14	0.00	14.12	Population size of the country (in 100 millions)
Sample size	67	70					
R^2	0.30	0.58					
F	5.99***	1183.68***					

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Clustered standard errors on paper IDs are used in t tests.

3. Analytical Framework

Discrimination can be classified into two broad categories: statistical and taste-based discrimination. Theories on taste-based discrimination suggest that landlords discriminate because contact with a less favoured ethnic minority group can cause psychological disutility (Becker, 1957). By contrast, statistical discrimination occurs when a letting agent or a private landlord treats individuals in different groups differently because they deem that group membership is associated with unobserved characteristics that affect the economic profits of their actions (Phelps, 1972). For example, a letting agent may use one's ethnic background as a proxy of his/her financial capability and, based on that stereotype, decide on whether to rent or sell property. In the context of housing studies, we develop the following general framework to illustrate how statistical- and taste-based discrimination can be captured at the housing inquiry stage.

Let Y be the probability of receiving a response to housing inquiries from the letting agents or landlords. Y is determined by several groups of factors as outlined in Equation (1).

$$Y = \theta_0 + \theta_1 E + \theta_2 G + \theta_3 F + \mathbf{X}\boldsymbol{\beta} + \varepsilon, \quad (1)$$

where E is an indicator of a certain minority ethnic background and G equals one for males. $F = 1$ for applicants with stable income and 0 otherwise. \mathbf{X} is a matrix of other determinants of Y such as whether an applicant has pets, or the property is currently under offer.

θ_1 and θ_2 are used to identify racial and gender discrimination. Specifically, when $\theta_1 < 0$, the corresponding ethnic minority group stands a worse chance of receiving a response from letting agents or landlords. When $\theta_2 < 0$, male tenants are less likely to receive a response than their female counterparts. Therefore, it is reasonable to assume that $\theta_3 > 0$ because landlords prefer tenants with stable jobs to reduce the chance of rent payment in arrears. Although F is an important factor in Equation (1), it is not directly observable, and applicants do not always tell the truth at the time of applying. If F is missing, Equation (1) reduces to Equation (2).

$$Y = \theta_0^* + \theta_1^* E + \theta_2^* G + \mathbf{X}\boldsymbol{\beta}^* + \varepsilon^*, \quad (1)$$

θ_1^* and θ_2^* suffer omitted variable bias that equals $\theta_3 \times \frac{cov(F,E)}{var(E)}$ and $\theta_3 \times \frac{cov(F,G)}{var(G)}$, respectively. Because $\theta_3 > 0$, the direction of the biases is determined by the correlation between F and the gender and racial indicators.

If the nature of discrimination is taste-based, landlords do not make an association between the qualification of a good tenant and applicants' financial health. $cov(F, E)$ and $cov(F, G)$ equal zero in this decision model. Omitted variable biases reduce to zero for θ_1 and θ_2 , or $\theta_1 = \theta_1^*$ and $\theta_2 = \theta_2^*$. In other words, the overall odds ratio or coefficient estimate of other variables might be biased by omitting F from Equation (2). The estimation of θ_1^* and θ_2^* is unaffected.

Statistical discrimination arises when $cov(F, E)$ and $cov(F, G)$ do not equal zero. In the absence of F , landlords must rely on available information to evaluate potential tenants. The most readily available information is stereotypes, e.g., statistics on incomes of different ethnic groups. As ethnic minorities tend to have low-income jobs, the correlation between E and F is negative. All else being equal, $\theta_3 \times \frac{cov(F,E)}{var(E)}$ is negative. Consequently, $\theta_1^* = \theta_1 + \theta_3 \times \frac{cov(F,E)}{var(E)} < \theta_1$. This downward omitted variable bias will exaggerate the discrimination against the ethnic minority group.

If the omitted variable is correlated with gender, the coefficient estimate of θ_2^* will contain biases, of which the direction is affected by $cov(F, G)$. Since males on average earn

more than females, $cov(F, G)$ is positive. Consequently, $\theta_2^* = \theta_2 + \theta_3 \times \frac{cov(F, G)}{var(G)} > \theta_2$. The coefficient of θ_2^* will be overestimated due to omitted variable bias, or the magnitude of discrimination against males (i.e., the absolute value of θ_2) will be underestimated.

Therefore, the nature of racial and gender discrimination can be identified through the comparison of a set of correspondence tests with income information included in the inquiries and another set without such information but otherwise identical. If the coefficient estimates of the gender and racial indicators changed significantly between the two groups, statistical discrimination prevails. Otherwise, taste-based discrimination dominates. We design the correspondence test based on this analytical framework and outline the implementation strategies in the next section.

4. Empirical Design and Implementation

4.1 Ethnic profiles

We conducted correspondence tests in the UK, which was the largest colonial power in history. The most populous territory in the British Empire was India. Consequently, India is the most common non-UK country of birth in 2021 (see Table 2). The Black African community is the third largest ethnic minority group in England and Wales (see Table 2). Nigerian is the largest African-born population in the UK in 2021 (ONS 2022). Therefore, we chose Indian and Nigerian as representative ethnic minorities for the ‘Colonial’ category.

During the COVID-19 pandemic period, the world witnessed a surge in anti-Asian sentiment (Grahame Allen & Zayed 2021; Lang 2021). For example, a considerably higher number of Chinese individuals fell victim to hate crimes during the early stages of the COVID-19 pandemic in the U.S. (Han, Riddell & Piquero 2022) and London (Gray & Hansen 2021). The impacts of these hate crimes are profound. For example, an analysis of social media posts on Quora between 2010 and 2021 found that the semantic similarity between Asian and Black people grew closer, while the semantic distance between Asian and White people increased (Jang, Youm & Yi 2023). This societal shift has already affected landlords’ perceptions of Asian renters. For instance, Sugasawa and Harano (2023) found that discrimination against Chinese and Korean renters increased during COVID-19 in Japan. We chose Chinese for the ‘Graylined’ group to verify whether this ethnic group suffers housing discrimination due to their association with the pandemic.

For the ‘Foreign’ category, we selected the Polish given it has been the most common European nationality in the UK since 2007, and the largest European-born population in the UK in 2021 (see Table 2). This design gives us five ethnic groups in this study: White British, Indian, Nigerian, Chinese and Polish.

We focus on the rental market in London because it is the least affordable in the UK (see Figure 4). A London renter spends about 45% of their median household income on rent, exceeding the 30% affordable ratio suggested by the ONS (ONS 2020). Meanwhile, the

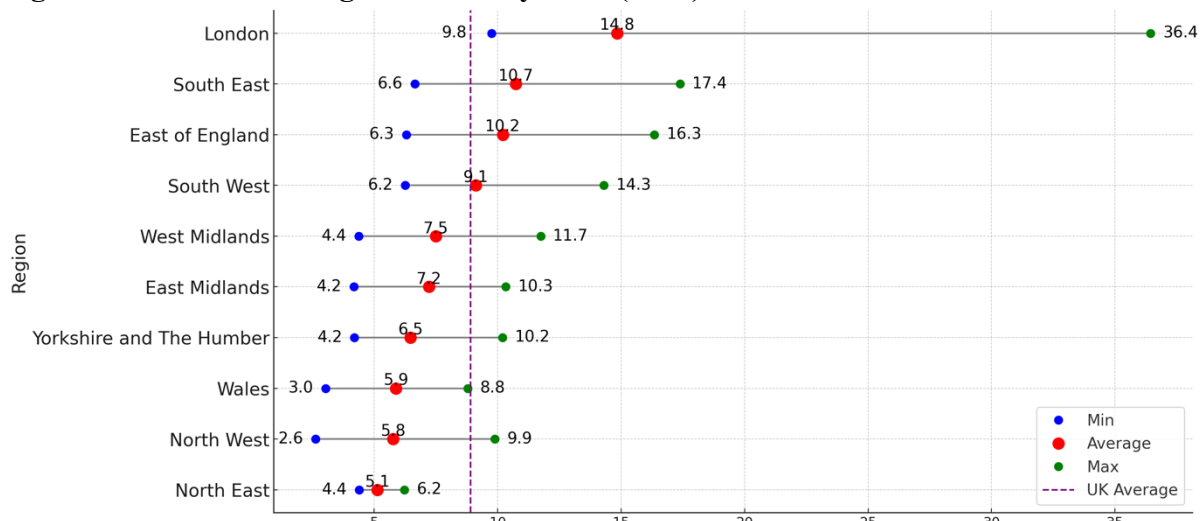
proportion of ethnic minorities in London's population is higher than that of national figures in all ethnic groups listed in Table 2. Only 43.35% of London's population is White British, in contrast to the 78.35% nationwide figure. As income is generally lower among ethnic minority groups, they are more prone to racial discrimination in areas with constrained housing availability and affordability, such as London.

Table 2: Overseas-born population in the United Kingdom by country (2020 – 2021)

Position in top ten	UK			London		
	Countries of Birth	Population Size	% of the UK Population	Countries of Birth	Population Size	% of London Population
1	India	896,000	1.35	India	357,000	3.93
2	Poland	682,000	1.03	Nigeria	142,000	1.56
3	Pakistan	456,000	0.69	Poland	127,000	1.40
4	Republic of Ireland	412,000	0.62	Italy	120,000	1.32
5	Germany	347,000	0.52	Pakistan	117,000	1.29
6	Romania	329,000	0.50	Romania	108,000	1.19
7	Nigeria	312,000	0.47	Bangladesh	105,000	1.16
8	South Africa	298,000	0.45	China	93,000	1.02
9	Italy	280,000	0.42	Republic of Ireland	92,000	1.01
10	China	245,000	0.37	USA	76,000	0.84

Source: Office of National Statistics.

Figure 4: Median housing affordability ratio (2020)



Source: Office for National Statistics - House Price Statistics for Small Areas, Annual Survey of Hours and Earnings

Notes: The housing affordability ratio refers to the ratio of the median price paid for residential property to the median workplace-based gross annual earnings for full-time workers.

A female and a male name were created for each of the five ethnic groups (see Table 3). To ensure the names created would indicate each applicant's gender and ethnic group, four rounds of pilot tests were carried out at *prolific.co*. We considered a name to pass the test if more than 80% of respondents correctly identified the gender and ethnic background associated with the name. Respondents in these pilot tests were residents in London only, with a 50/50 gender ratio. Since it is mandatory to provide an email address to the agents, we created 10 Google *Gmail* accounts for each applicant. Each applicant's first and last names are included in the email address. Meanwhile, telephone numbers were registered for each applicant. We used four mobile telecommunication companies – O2, Vodafone, EE, and Giffgaff – to ensure

that the phone numbers are not similar, which may otherwise cause suspicion on behalf of the letting agents.

Table 3: Fictitious names and email addresses

Name	Ethnic Background	Gender
Olivia Wilson	White British	Female
George Smith	White British	Male
Meijuan (Jenny) Li	Chinese	Female
Jianxiong (Ben) Pang	Chinese	Male
Ananya Patel	Indian	Female
Ramesh Agarwal	Indian	Male
Zuzanna Malinowska	Polish	Female
Krzysztof Wisniewski	Polish	Male
Amara Okeke	Nigerian	Female
Jed Abimbola	Nigerian	Male

4.2 Employment Information

There were three types of employment information included in the experiment: white-collar, blue-collar and no employment information. When white-collar employment information was provided, the applicant stated that he/she worked as a banker, lawyer, medical practitioner, primary school teacher, secondary school teacher, or consultant. When blue-collar employment information was provided, the applicant stated that he/she worked as a taxi driver, bus driver, takeaway deliverer, grocery store cashier, factory worker or construction site worker. If no employment information was provided, the applicant would state that he/she wanted to view the property without further information. By doing so, we would be able to examine if statistical discrimination exists.

The type of occupation was randomly assigned to the applicants, i.e., the British blue-collar female applicant applied to advertisement A as a taxi driver but as a construction site worker in advertisement B. We also ensured that no two applicants would state the same occupation to the same letting agent. For example, we avoid the case that both Olivia Wilson (the British female applicant) and Ananya Patel (the Indian female applicant) apply to advertisement A as a lawyer.

4.3 Implementation of the correspondence test

We generated messages for each application randomly by following the process demonstrated in Table A2 in the Appendix. The purpose of random generation is to reduce the likelihood of the same messages being delivered to the same letting agent, which would cause suspicion and consequently the block of the email addresses.

The field experiment was conducted at *Rightmove.co.uk* because it is currently the UK’s biggest property portal, receiving 127.5 million visits per month (Home Owners Alliance, 2022). The experiment took place between December 2021 and April 2022, and only new

advertisements in the Greater London Area were used. We include listings by real estate letting agents only because the proportion of advertisements by private landlords is small. Property listings were selected carefully to ensure that the same letting agent was not contacted several times to minimise the chance of detection.

A total of 2,160 emails were sent to 540 property listings. Each advertisement was sent four emails from the White British, Indian, and a random selection of two of the other three ethnic groups while holding gender and employment information type constant. This roughly represents the proportion of the population of ethnic minority groups in Table 2. The data set consists of 540 observations for the White British and Indian groups and 360 observations for the Nigerian, Chinese, and Polish groups. The sample is evenly distributed between genders and information types.

When a personalised message from the letting agent was received, the experiment was immediately terminated by withdrawing the application to minimise the cost associated with time and effort on the letting agents. If there was no response from the letting agent within seven days after the application, the data collection for that sample would end, and the response type would be recorded as no response. Ethical approval was obtained from the Research Committee of the authors' institution.

5. Empirical Results and Discussions

5.1 Is there evidence of gender discrimination in the UK housing market?

We first examine differences in response rates to rental applications by ethnicity, gender, and employment type. As shown in Table 4, British applicants were more likely to receive a positive response than all four minority groups, with the only exception of Chinese females when no employment information was included in emails. Racial discrimination is evident in nearly all settings. Another way to interpret this result is that ethnic minority groups may have to send 3 to 4 emails to receive a response, while British applicants only need to send two emails to get a response.

Results in Table 4 also demonstrate variations in the discrimination rates between ethnic minority groups. For example, when no employment information is provided, Chinese applicants were the least discriminated against, receiving 7% more responses than Nigerian applicants, 9% more than Polish applicants, and 10% more than Indian applicants. The gaps in response rates were not changed significantly by the inclusion of blue-collar employment information but narrowed notably when white-collar employment information was mentioned in emails. Overall, there is no evidence that Chinese renters are 'Graylined' due to COVID-19. Indeed, the pandemic did not affect housing discrimination uniformly. For example, Verhaeghe and Ghekiere (2021) found that housing discrimination was aggravated by COVID-19 in Belgium, while such an influence was not detected in the Swiss housing market (Auer, Ruedin & Van Belle 2023).

The gender disparity in response rate is complicated. The gender gap is less than 3% for White British and Indians but over 5% for the other three groups. Female renters are preferred among Chinese applicants and the opposite is true for other groups. The inclusion of blue-collar employment information hurts male applicants more, and female applicants benefit much more from mentioning white-collar jobs in their inquiries. This suggests that statistical discrimination is the main driver of gender discrimination in the London rental housing market.

Table 4: Response rates

	British	Indian	Nigerian	Chinese	Polish	All
<i>Panel A: No employment information</i>						
Received responses	91	70	50	59	48	318
Males	46	36	29	28	26	165
Females	45	34	21	31	22	153
Response rate	51%	39%	42%	49%	40%	44%
Males	51%	40%	48%	47%	43%	46%
Females	50%	38%	35%	52%	37%	43%
<i>Panel B: Blue-collar</i>						
Received responses	80	60	32	51	33	256
Males	37	28	14	24	16	119
Females	43	32	18	27	17	137
Response rate	44%	33%	27%	43%	28%	36%
Males	41%	31%	23%	40%	27%	33%
Females	48%	36%	30%	45%	28%	38%
<i>Panel C: White-collar</i>						
Received responses	110	93	62	66	56	387
Males	51	40	29	31	19	170
Females	59	53	33	35	37	217
Response rate	61%	52%	52%	55%	47%	54%
Males	57%	44%	48%	52%	32%	47%
Females	66%	59%	55%	58%	62%	60%

5.2 What drives housing discrimination in the UK?

We estimate logistic regression models to test the patterns identified in Table 4. Female, White British, and ‘no employment information’ are omitted as the reference category for gender, ethnic group, and information type, respectively. The coefficient estimates are given in Table 5. The baseline model was estimated with the full sample. The negative coefficient loading of Gender (Male = 1) translates to an odds ratio of 0.80, which means male renters’ odds of receiving responses is 0.20 points lower than female renters. This marginal preference for female renters is not statistically significant. Racial discrimination, as indicated by a significant and negative coefficient estimate of the ethnic indicators, is identified for Indian,

Nigerian, and Polish renters. High-paying job information increased the odds ratio of getting responses, and vice versa. These are consistent with the patterns shown in Table 4.

The full model includes interaction terms between information types and indicators of gender and ethnic background. When no employment information is available, there is a preference for male renters with an odds ratio of 1.15 (i.e., $e^{0.14}$). This pattern was reversed when employment information was included in emails: the odds ratio was reduced to 0.80 and 0.59 when blue-collar and white-collar employment information were available. Further analysis by estimating the model with the male and female sub-samples separately (i.e., Models 3 and 4 in Table 5) shows that blue-collar employment information reduced the odds ratio for male renters primarily, while white-collar employment information helped female renters only. This confirmed that gender discrimination is largely statistical discrimination. When income information is unavailable, property agents must rely on stereotypes to assess potential renters. Renters who do not fit the ‘men earn more than women’ stereotype, such as males working on blue-collar jobs and females with white-collar jobs, suffer statistical discrimination when employment or income information is readily available. Their odds ratios changed significantly when employment information was made available, and agents realised that they did not fit the stereotype.

Most interaction terms between ethnic indicators and information types are not statistically distinguishable from zero. Therefore, racial discrimination against ethnic minorities is largely taste-based. Providing employment information hardly changed agents’ attitudes towards them. The association with low-paying jobs reinforced agents’ negative perceptions towards Nigerian and Polish renters, resulting in a large drop in the response rate for these two groups. When Polish renters included white-collar employment information in their mails, the response rate dropped. In the UK, Polish immigrants typically work in blue-collar roles, such as construction or janitorial services. It seems that letting agents’ prejudice against Polish renters is so strong that merely stating one has a high-paying job raises the suspicion of lying. This may lead to a decrease in response rate. Overall, the evidence of statistical discrimination is not strong.

Table 5. Logistic Regression Results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	Baseline model	Interaction terms	Male	Female	No Employment Information	Blue-Collar Jobs	White-Collar Jobs
Gender (Female = 1)	-0.20	0.14			0.14	-0.22	-0.53**
Blue Collar		-0.07	-0.55*	-0.19			
White Collar		0.77***	0.06	0.73***			
Chinese	-0.13	-0.06	-0.14	-0.12	-0.06	-0.08	-0.26
Indian	-0.43***	-0.47***	-0.46***	-0.43***	-0.47***	-0.47***	-0.39***
Nigerian	-0.49***	-0.36**	-0.40***	-0.61***	-0.36**	-0.79***	-0.39**
Polish	-0.57***	-0.43***	-0.66***	-0.51***	-0.43***	-0.75***	-0.60***
Gender × Blue Collar		-0.36					
Gender × White Collar		-0.67*					
Chinese × Blue Collar		-0.02					
Indian × Blue Collar		0.08					
Nigerian × Blue Collar		-0.43*					
Polish × Blue Collar		-0.32					
Chinese × White Collar		-0.20					
Indian × White Collar		0.08					
Nigerian × White Collar		-0.03					

Polish × White Collar		-0.17					
N	2160	2160	1080	1080	720	720	720
Chi 2	69.9***	99.61***	52.14***	39.72***	20.6***	46.48***	18.25***
Pseudo R2	0.01	0.03	0.02	0.04	0.01	0.02	0.02

Note: $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered on property ID.

6. Robustness checks

It is likely that real estate agents prioritise the letting of certain types of properties over others. This may potentially bias the estimations. We included three property attributes in the full model to check the robustness of our results. These variables include indicators of whether the listing is a shared property or furnished, as well as the monthly rent. The results are reported in Table 6. The results suggest that property agents are more likely to respond to inquiries about expensive, furnished, or shared property. However, our conclusions are not affected by the inclusion of these additional control variables.

Table 6. Logistic Regression Results – with property attributes

	Model 1	Model 2
	Full model	With additional controls
Gender (Male = 1)	0.14	0.16
Blue Collar	-0.07	0.03
White Collar	0.77***	0.81***
Chinese	-0.06	-0.06
Indian	-0.47***	-0.48***
Nigerian	-0.36**	-0.36**
Polish	-0.43***	-0.43***
Shared		0.22
Furnished		0.23
Rent		0.10*
Gender × Blue Collar	-0.36	-0.35
Gender × White Collar	-0.67*	-0.74**
Chinese × Blue Collar	-0.02	-0.01
Indian × Blue Collar	0.08	0.08
Nigerian × Blue Collar	-0.43*	-0.44*
Polish × Blue Collar	-0.32	-0.33
Chinese × White Collar	-0.2	-0.19
Indian × White Collar	0.08	0.08
Nigerian × White Collar	-0.03	-0.05
Polish × White Collar	-0.17	-0.17
χ^2	99.61***	106.83***
Pseudo R^2	0.03	0.04

Note: $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered on property ID.

7. Policy Implications and Conclusions

Housing discrimination has significant repercussions for labour mobility, economic equality, and social justice. It is elusive and persistent, making its detection and elimination challenging. Similar to gender and racial discrimination in the labour market (Quillian *et al.* 2017), there is limited evidence that housing discrimination has been significantly reduced in recent decades (Bao 2023b). While social and cultural dynamics are constantly shifting, new forms of housing discrimination, such as that against same-sex couples, are also emerging

(Flage 2021). We conducted a survey of 40 correspondence tests in the housing markets in 20 countries in Asia, Europe, and North America. Our findings indicate that the odds ratio for ethnic minorities receiving a response to their rental inquiries has not changed significantly over the past two decades. Discrimination is more pronounced in less ethnically diverse countries, especially in former colonial powers. However, empirical evidence from these regions is scant. To address this gap in the literature, we conducted correspondence tests in the UK.

We also developed an analytical framework to explore the nature of housing discrimination in London, where housing affordability is the country's lowest. Employment information was randomly included in email requests to view advertised properties on a major online property portal in the UK. We found evidence of gender and racial discrimination in the London rental housing market. Consistent with existing literature, the odds ratio of ethnic minorities receiving responses from letting agents is substantially lower than that of their White British counterparts. Female renters are favoured, especially when they provide information about high-paying jobs in their email inquiries. Including blue-collar and white-collar job details affected the response rate for all ethnic groups. However, the impact on the White British group was similar to that on ethnic minority groups, meaning racial gaps in response rates were not reduced by the provision of this information. Racial discrimination in the London rental housing market is primarily taste-based.

Our research offers insights for designing policy interventions to counter racial discrimination in the housing market. While ethnic minorities can improve their chances of obtaining a viewing invitation by providing details about desirable employment, this strategy benefits the White British group just as much. We could promote this strategy or mandate online property listing portals to streamline the sharing of such information between agents and potential renters. However, this is unlikely to bridge the gap between the majority and ethnic minority groups. When racial discrimination is rooted in personal preferences, a long-term societal change is essential. Specifically, concerted efforts from both the government and society are needed to cultivate an ethnically diverse and inclusive community. This would fundamentally shift social preferences towards ethnic minorities. Housing and urban planning policies play a crucial role in this initiative, as the residential environment shapes interpersonal interactions, which in turn influence perceptions and treatment of individuals from different backgrounds.

Our study can be improved in several ways. First, we recorded responses from the letting agents at the early stage of the rental process. However, discriminatory behaviours may also occur at later stages of a rental process. For instance, letting agents may show fewer houses or houses in less desirable neighbourhoods to ethnic minorities. Future studies should consider discrimination in later stages of housing inquiries by adopting an in-person audit method (Turner *et al.* 2002; Turner *et al.* 2012).

Second, although we found evidence of statistical discrimination, our validation method for taste-based discrimination is indirect. Ideally, the individual characteristics of letting agents

and landlords, such as gender, ethnicity, and age, should be incorporated into the analysis. Our study was limited by the nature of correspondence tests, where property agents and landlords participate unaware of the ongoing experiment. Thus, obtaining reliable data about their personal characteristics, directly or indirectly, is not feasible. Some researchers circumvented this constraint by directly surveying and interviewing letting agents (Ziersch, Loehr & Miller 2023). However, the reliability of their responses might be dubious due to the sensitivity of the subject matter. Pair-testing offers a more valid and reliable approach, where the personal attributes of letting agents and any discriminatory behaviours can be directly observed and documented. But pair-testing is considerably expensive, making it a less common choice. With technological progress, innovations like virtual reality and artificial intelligence might soon lower the costs of such testing methods.

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Appendix

Table A1: List of papers included in the Literature Review section

No	Paper	Country	Majority Group	Type of discrimination		
				Graylined	Foreign	Colonial
	(1)	(2)	(3)	(4)	(5)	(6)
1	Carpusor and Loges (2006)	USA	White	✓		✓
2	Ahmed and Hammarstedt (2008)	Sweden	Swedish	✓		
3	Ahmed, Andersson, and Hammarstedt (2010)	Sweden	Swedish	✓		
4	M. Bosch, Carnero, and Farre (2010)	Spain	Spanish		✓	
5	Baldini and Federici (2011)	Italy	Italian	✓	✓	
6	Hanson and Hawley (2011)	USA	White			✓
7	Hogan and Berry (2011)	Canada	Anglo-Saxon Caucasian	✓	✓	✓
8	Andersson, Jakobsson, and Kotsadam (2012)	Norway	Norwegian	✓		
9	Bengtsson, Iverman, and Hinnerich (2012)	Sweden	Swedish	✓		
10	Feldman and Weseley (2013)	USA	White		✓	✓
11	Carlsson and Eriksson (2014)	Sweden	Swedish	✓		
12	Ewens, Tomlin, and Wang (2014)	USA	White			✓
13	Hanson and Santas (2014)	USA	White		✓	
14	Mariano Bosch, Carnero, and Farré (2015)	Spain	Spanish		✓	
15	Carlsson and Eriksson (2015)	UK	White	✓	✓	✓
16	Mazziotta, Zerr, and Rohmann (2015)	Germany	German	✓		
17	Acolin, Bostic, and Painter (2016)	France	French	✓	✓	✓
18	Bartos, Bauer, Chytilova, and Matejka (2016)	Czech Republic	White		✓	
19	Auspurg, Hinz, and Schmid (2017)	Germany	German	✓		
20	Öblom and Antfolk (2017)	Finland	Finish	✓		
21	Björnsson, Kopsch, and Zoega (2018)	Iceland	Icelandic		✓	
22	Murchie and Pang (2018)	USA	White	✓		✓
23	Antfolk, Szala, and Oblom (2019)	UK	White	✓	✓	
24	Antfolk, et al. (2019)	Poland	Polish	✓		
25	Bunel, Gorohouna, L'Horty, Petit, and Ris (2019)	New Caledonia	European			✓
26	Sansani (2019)	Israel	Less religious Jews	✓		
27	Auspurg, Schneck, and Thiel (2020)	Germany	German	✓		
28	Sawert (2020)	Germany	German	✓		
29	Verhaeghe and Ghekiere (2021)	Belgium	Belgian	✓		✓
30	Ghekiere and Verhaeghe (2022)	Belgium	Belgian	✓		
31	Gusciute, Muhlau, and Layte (2022)	Ireland	Irish		✓	✓
32	Martiniello and Verhaeghe (2022)	Belgium	Belgian	✓	✓	✓
33	Molla, Rhawi, and Lampi (2022)	Sweden	Swedish	✓	✓	
34	Moritz and Manger (2022)	Germany	German	✓		
35	Verhaeghe and De Coninck (2022)	Belgium	Belgian	✓	✓	
36	Ghekiere, Martiniello, and Verhaeghe (2023)	Belgium	Belgian	✓	✓	
37	Lacroix, Ruedin, and Zschirnt (2023)	Switzerland	Swiss		✓	
38	Liu and Rommel (2023)	China	Han Chinese	✓		
39	Martiniello and Verhaeghe (2023)	Belgium	Belgian	✓		
40	Sugasawa and Harano (2023)	Japan	Japanese		✓	
Total				29	18	12

Note: Antfolk, et al. (2019) is listed twice in this table because it includes studies on both the UK and Poland.

Table A2: Message used

We used Excel to randomly generate messages for each application, and the random generation followed the template demonstrated below. To reduce the probability of causing suspicion on behalf of the letting agents, there are several versions of the message in each part to ensure applicants' messages to the same letting agent are different. Three examples are provided after the template.

Template:

[Greeting Salutation],

[First Sentence].

[Employment Information].

[Closing Salutation],

[Applicant's Name]

1. Greeting Salutation:

Version	Greetings
1	Hi there
2	Hello
3	Hi

2. First Sentence:

Version	First Sentences
1	I am interested in renting this property. It'd be great if you could set up a time to see it.
2	Your property looks like a good fit for what I am looking for. Is It still available? If yes, it'd be great to set up a time to visit it.
3	I would like to ask if this property is still available. If yes, it'd be great if we could arrange a time to visit it.
4	Is this property still available for rent? If yes, it'd be awesome if we could arrange a time to visit it.
5	Your property looks lovely to me. It'd be awesome if we could arrange a time to visit it if it is still available.
6	This is a lovely property. Is It still available? If yes, it'd be great to set up a time to visit it.
7	I am wondering if this property is still available. If yes, may I have a chance to view it?
8	Is this property still available? If yes, may I arrange a viewing with you?
9	I really like this property. It'd be awesome if we could arrange a time to visit it, if it is still available.
10	How are you? I would like to arrange a viewing of this property - it looks lovely and is exactly what I am looking for.

3. Employment Information (White-Collar):

Version	Employment Information – White-Collar
1	I just took a new job in a bank, and it has been quite hectic. So, every day after 6 pm works better for me. An email response will be great since I am not on my phone at the office.
2	I work in a law firm and usually finish work after 6pm. I may miss the phone call at work so that email may work better.
3	My work hours are kind of crazy (bloody consulting firm!). So I might not be able to take your phone call until late into the night. Email response is preferred. Thanks very much for your understanding!
4	I teach in a primary school and am not able to take phone calls while at work. But you can always reach me by my email.
5	I am a secondary school teacher and answering phone calls during office hours is difficult. Emails would be much better! Looking forward to hearing from you!
6	I am running a medical practice, and won't be able to answer personal phone calls at work. An email response will be much appreciated!

4. Employment Information (Blue-Collar):

Version	Employment Information – Blue-Collar
1	I work on a construction site. Would love to have a chance to see the inside. Emails work better for me than phone calls, by the way. Cheers!
2	I work in a factory during daytime and might not be able to answer your phone calls. Please contact me by emails.
3	I work in a grocery store near this address. It would be great to live there. Emails is the best way to reach me. Looking forward to hearing from you!
4	I am a taxi driver. Would be lovely to see it in person. I may not be able to answer your phone calls while driving - email works better.
5	I am a bus driver and have odd shifts between 6am and 9pm every day. If I miss your phone call please send me an email or leave a message.
6	I deliver takeaways for a restaurant. Really like the place. I may not be able to answer your phone calls while at work. Please send me an email!

5. Closing Salutation:

Version	Closing Salutation
1	Sincerely
2	Yours
3	Best wishes
4	Best
5	Regards
6	Thanks
7	Thanks a lot
8	Cheers
9	Warmest regards
10	Sincerely yours

Sample 1 (British Blue-Collar Male Applicant):

Hi,

I am interested in renting this property. It'd be great if you could set up a time to see it.

I deliver takeaways for a restaurant. Really like the place. I may not be able to answer your phone calls while at work. Please send me an email!

Sincerely yours,
George Smith

Sample 2 (Nigerian White-Collar Female Applicant):

Hi there,

Is this property still available? If yes, may I arrange a viewing with you?

I am running a medical practice and won't be able to answer personal phone calls at work. An email response will be much appreciated!

Warmest regards,
Amara Okeke

Sample 3 (Chinese Male Applicant with No Employment Information):

Hi there,

Your property looks lovely to me. It'd be awesome if we could arrange a time to visit it, if it is still available.

Best,
Jianxiong (Ben) Pang

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