**The geography of rental housing discrimination, segregation, and social exclusion:**

**New evidence from Sydney**

Professor Heather MacDonald, University of Technology Sydney

Professor George Galster, Wayne State University

Dr. Rae Dufty-Jones, Western Sydney University

Corresponding Author contact information:

Heather MacDonald, School of Built Environment, University of Technology Sydney, PO Box 123, Ultimo, NSW 2007, Australia. Email: heather.macdonald@uts.edu.au

Acknowledgements

This research was supported under the Australian Research Council’s Discovery Projects Funding Scheme, grant number DP110103197. The authors gratefully acknowledge the contribution of Rosalie Atie, who helped manage the project and prepare the data. We are also grateful to our colleagues Professor Kevin Dunn (Western Sydney University), Jacqueline Nelson (University of Technology Sydney), and Professor Yin Paradies (Deakin University) for their contributions to the conceptualisation of this project.

Abstract

We investigate whether rental housing discrimination directed against two predominant ethnic minority groups in Sydney, Australia is more likely to occur in neighborhoods with a particular mix of ethnicities, socio-economic profiles, or quality of social goods, and whether this geographic pattern reinforces spatial disadvantages of these minorities in a way that abets their social exclusion. We construct measures of differential treatment based on in-person paired testing conducted in 2013, with Anglo, Indian and Muslim-Middle Eastern testers. We summarise four dimensions of post-code level social goods using a Principle Components Analysis reflecting school quality, crime rates, resident employment rates, proximate jobs and job growth, and commuting options. Our OLS regressions show that differential treatment in the Sydney rental market is strongly related to a neighborhood’s ethnic composition and two aspects of its social goods involving both desirable and undesirable components, but is not related to the socio-economic characteristics of the neighborhood’s population.

**The geography of rental housing discrimination, segregation, and social exclusion:**

**New evidence from Sydney**

Individual acts of discrimination aimed at ethnic minorities undoubtedly impose severe burdens on their victims in terms of extra search costs and superior dwelling options foregone (Yinger, 1995). But the harms may be even more severe if housing discrimination occurs in systematic geographic patterns so that minority households’ opportunities for residing in particular locations are limited. That is, if discriminatory barriers are highest in certain sorts of neighborhoods the result may be increased segregation by ethnicity, socio-economic status, and/or access to social goods (like employment, safety, public transportation and high-quality education).

Involuntary segregation that perpetuates historical disadvantages is a component of the broader concept of *social exclusion*, a multidimensional construct including an individual’s economic resources, their social, economic, political and cultural participation, and (broadly defined) well-being (Levitas et al 2007). It is thus understandable that ensuring fair access to housing regardless of gender, family characteristics, religion, and most particularly race or ethnicity, has long been seen as one of the key ways a market-based housing system should be regulated to achieve a more equitable and inclusive society (Galster 1995; Yinger, 1995). Of salient concern have been potential discriminatory acts that limit access of disadvantaged groups to spaces within the metropolitan housing market offering better opportunities for social advancement, thus reinforcing and perpetuating their groups’ disadvantage (Galster and Keeney, 1988; Galster, 1991; Kain 1992; Massey and Denton 1993). From the perspective of social exclusion there is ample equity rationale, therefore, for investigating the geography of discrimination.

While considerable prior U.S. research has examined how the distinctive geographic variation of discriminatory barriers has limited minorities’ access to predominantly white-occupied neighborhoods, few studies have considered access to higher socio-economic status neighborhoods, and none have considered access to neighborhoods with superior social goods.[[1]](#endnote-1) Our study advances the literature by investigating whether rental housing discrimination directed against two predominant ethnic minority groups in Sydney, Australia is more likely to occur in neighborhoods with a particular mix of ethnicities, socio-economic profiles, or quality of social goods, and whether this geographic pattern reinforces spatial disadvantages of these minorities in a way that abets their social exclusion. Sydney offers an interesting case because, as we amplify below, it exhibits a diverse ethnic makeup, rapid immigration and a tight housing market that (as we find) yields a comparable incidence of housing discrimination to that found in U.S. and European studies.

This paper is based on the first Australian study of the incidence of differential treatment in rental housing, using the paired-tester method. The study focuses on two significant ethnic minority groups (Indian- and Muslim Middle-Eastern-origin, comprising respectively 2.8% and 3.2% of Sydney’s population) who have been identified as facing high levels of prejudice in broader studies of racist attitudes in Australia (Dunn et al 2009; Dunn et al 2011; Singh 2011) and thus raise policymakers’ concerns over their potential social exclusion. Previous Australian research has found that 20.8% of Muslim Australians and 17.5% of Sri-Lankan and Indian-born respondents reported experiencing racism when renting or buying a house (Nelson et al 2015). Paired tests investigated how the experiences of testers from these two ethnic groups seeking rental dwellings contrasted with those of Anglo testers. The study was conducted in 2013, and employed 18 pairs of testers matched on gender, age, and other personal attributes. Previous analyses of these data have offered clear evidence that these two ethnic minorities are treated differently from Anglo Australians on several dimensions of the rental dwelling search process (MacDonald et al 2016). This paper probes the geographic variation of this discrimination and, by inference, its impact on segregation-induced social exclusion, by analysing whether the intensity of differential treatment is associated with three sets of spatial indicators of advantage: neighborhood social goods, ethnic concentrations, and socio-economic status. Our specific research question is:

*Is the degree to which an Anglo-Australian tester receives favorable treatment (more rental housing options, information, assistance, etc.) directly related to the neighborhood’s:*

* *Access to desirable social goods (school quality, safety, public transport, employment)?*
* *Absence of non-Anglo ethnic and immigrant concentrations?*
* *Residents’ relative socio-economic status ranking?*

To introduce our method, we first construct a composite index measuring intensity of differential treatment discrimination (‘encouragement to rent’), based on the outcome of each test.[[2]](#endnote-2) The measure is based on a Principal Components Analysis (PCA) of several dimensions of differential treatment, with the scores for the factors summed. Next, we summarize neighborhood-level social goods using a PCA based on school quality, crime rates, resident employment rates, proximate jobs, job growth, and commuting options. We estimate OLS regression models for the encouragement to rent index, including as predictors the various neighborhood social goods factor scores, the concentrations of different minority ethnic groups and recent international migrants, and the Australian Bureau of Statistics Index of Relative Social Advantage and Disadvantage (IRSAD). In brief, we find that differential treatment in the Sydney rental market is strongly related to a neighborhood’s ethnic composition and two aspects of its social goods involving both desirable and undesirable components, but is not related to the socio-economic characteristics of the neighborhood’s population.

Our paper is organized as follows. We begin in sections 1 and 2 with reviews of received theory and evidence related to why and how housing discrimination might vary geographically and how this could produce differential social opportunities. We then describe the context in our study site, metropolitan Sydney, Australia. Section 4 discusses our data, measures, and methodological approach for addressing our research questions. In sections 5 and 6 we present the results of the analysis and discuss the implications for our understanding of how differential treatment in the rental housing market may affect social exclusion.

1. **Theoretical framework**

We can identify three main theoretical explanations of real estate agent discrimination against ethnic minorities in the rental housing market: personal prejudice, customer prejudice, and statistical discrimination (Yinger, 1995; Choi, Ondrich and Yinger, 2005; Oh and Yinger, 2015). The last two are of most relevance to this paper because they are applicable to understanding why and how discrimination in the rental housing market may vary across space.[[3]](#endnote-3)

Customer prejudice theory states that rental agents believe that their Anglo customers (in this case current or prospective tenants in the buildings they own or manage) are prejudiced against ethnic minorities and/or recent immigrants (perhaps because they are not “real Australians”), would prefer not to live near them, and are willing to pay for their preference for self-segregation. If agents’ current Anglo renters in buildings with no (or few) minorities/immigrants, located in predominantly Anglo-occupied neighborhoods, are paying more in aggregate than if more minorities/immigrants were introduced, agents may discriminate in an effort to exclude such less-profitable households who attempt to rent in such Anglo-occupied places.[[4]](#endnote-4) By similar logic, agents with vacancies in mixed or largely minority-occupied buildings located in similarly composed neighborhoods will have little incentive to treat their applicants differentially on the basis of their ethnicity.

Statistical discrimination theory states that agents discriminate to make the rental process more efficient, by concentrating their efforts on customers they judge to be most likely to conclude the transaction, based on prior experience with members of different ethnic groups (Yinger 1998). Economic drivers are also key here, with statistical discrimination designed to minimise agents’ amount of work and time required for the transaction by strategically allocating the most assistance, information and encouragement to the applicants who statistically are “most likely to rent” in the given context. Agents might make several generalizations about prospective Anglo and minority renters that would lead them to alter their differential treatment behaviors according to the desirability and expensiveness of the neighborhood in which the vacancy is located. Experience perhaps has taught them that Anglos are more likely to be able to come up with substantial security deposits and first-month’s rent in advance, and/or are willing to pay more for neighbors with higher socio-economic status and neighborhoods with more social goods. Agents may also have (formal or informal) evidence that Anglos will be more reluctant than minorities or immigrants to consummate rental contracts in less desirable places because Anglos have more familiarity with and greater access to a wider range of residential options in Sydney. Thus, we would expect that agents with this motivation would put more effort into assisting and encouraging Anglo clients searching for housing in more desirable locations, but just the opposite in less desirable locations

In sum, clear hypotheses can be derived from these theories about why and how discrimination in the rental housing market should vary geographically across dimensions we will measure in our study. Based on customer prejudice theory, one would hypothesize that differential treatment favoring Anglos would be more prevalent in neighborhoods where Anglos predominated, less so in neighborhoods where there were more minorities and recent immigrants. Based on statistical discrimination theory, one would hypothesize that differential treatment favoring Anglos would be more prevalent in neighborhoods with higher-status residents and better social goods, with differential treatment favoring minorities more prevalent in neighborhoods that are less-desirable along these lines. Unfortunately, as we demonstrate in the next section, past research has only partially tested these hypotheses empirically, a gap in the literature this paper will address.

1. **Review of research on housing discrimination, segregation and socio-economic opportunity**

There are four strands of statistical scholarly literature that are relevant to our study because they probe different aspects of the discrimination-segregation-socio-economic opportunity nexus. One strand measures the incidence and nature of individual acts of racial-ethnic discrimination in housing markets using the paired testing method. A second quantifies the relationship between such discrimination in the aggregate and resultant patterns of residential segregation at the metropolitan level. A third connects segregation to inter-ethnic socio-economic disparities, employing both individual and metropolitan levels of analysis. A fourth strand attempts to identify geographic variations in individual acts of housing discrimination and draw inferences about consequences for segregation and social exclusion. As we explain, our current study provides crucial missing elements in the fourth strand that serves to help link all of them.

First, there is a longstanding literature that explores housing market discrimination against racial/ethnic minorities that employs the consensually accepted investigative tool of in-person paired testing. Perhaps the most famous of these are the four periodic studies of the nationwide incidence of discrimination in U.S. metropolitan areas that have been sponsored by the U.S. Department of Housing and Urban Development in 1977 (Wienk et al, 1979); 1989 (Turner, Struyk and Yinger, 1991); 2000 (Turner et al. 2002) and 2010 (Turner et al. 2013). These studies have documented the widespread nature of discrimination against African Americans, Latino Americans and (most recently) Asian American home and apartment-seekers. Though for African Americans the incidence has declined over time, the latest evidence continues to show that all U.S. minorities’ housing options are constrained by discrimination. A variant of paired-testing using only contacts via the phone, mail or internet, “correspondence studies,” has also been used in other national contexts to assess the relationship between ethnicity and housing discrimination, including Sweden (Ahmed and Hammarstedt 2008), Norway (Andersson, Jakobsson, and Kotsadam 2012), Britain (Carlsson and Eriksson 2013), Italy (Baldini and Federici 2011), and Spain (Bosch, Carnero and Farre 2011). In Australia, while paired-testing (in either in-person or correspondence forms) has not been used to provide a systematic assessment of the role of ethnicity in experiences of housing discrimination (prior to Nelson et al 2015), correspondence testing has been used to study employment discrimination (Booth, Leigh and Varganova 2011).

A second strand of literature has examined the degree to which discrimination was responsible for observed patterns of residential segregation in U.S. metropolitan areas, and has generated considerable contention (cf. Clark, 1986, 1988, 1989; and Galster, 1988, 1989). Clark (1986; 1993; 2007), Armor (1995) and Clark and Morrison (2008) have argued that residential segregation is primarily due to voluntary spatial sorting of households based on observed differences in preferences and incomes, their position buttressed by case studies and simulation models. By deduction, discrimination must have little residual explanatory role to play. This view has been challenged by Galster and Keeney (1988) and Galster (1991), who estimated multivariate, structural equation statistical models of the relationship between observed incidences of housing discrimination (measured by paired tests) and racial/ethnic residential segregation in U.S. metropolitan areas. According to their models, segregation would drop by roughly a third if discrimination could be eliminated, though Clark (1993) counters that the same models indicate that discrimination is responsible for only 12% of cross-metropolitan variation in segregation.

The third strand of literature has documented with a variety of rigorous statistical methods the degree to which residential segregation abets the social exclusion of minorities. The substantial socio-economic and health costs that segregation imposes on Latinos and African Americans in the U.S. have been quantified by Price and Mills (1985), Galster (1987a; 1991), Galster and Keeney (1988), Santiago and Galster (1995), Cutler and Glaeser (1997), Chang (2006), Lee and Ferraro (2007), Kramer and Hogue (2009), and Nelson (2013). Though there has been no lack of plausible arguments about how segregation adversely affects minorities (e.g., see summary in Massey and Denton, 1993), plausibly causal empirical evidence has been scarce. Galster (1987a; 1991) and Galster and Keeney (1988) found using instrumental variable models that cross metropolitan variations in black-white segregation (measured by various indices) were strongly related to interracial educational and income differentials; Santiago and Galster (1995) employed similar methods to derive similar conclusions regarding Puerto Ricans in the U.S. Cutler and Glaeser (1997) also found using instrumental variable models that African Americans’ isolation from Anglos per se was roughly as important an influence on a variety of socioeconomic outcomes as the degree to which they were relatively concentrated in the central city municipality, exposed to college-educated neighbors, and far from places of employment. Galster and Santiago (2017) found using a public housing natural experiment that the dominant share of segregation’s multiple harmful effects on African American and especially Latino children transpired by relegating them to inferior places (particularly neighborhoods with higher crime, lower occupational prestige residents and greater pollution), not by a high concentration of minority residents itself.

So, if indeed a major (perhaps even dominant) negative effect of racial/ethnic segregation manifests itself as minorities overrepresented in disadvantaged spaces (in terms of social goods and resident ethnic and socio-economic composition), is there direct evidence that housing market discrimination directs minority home-seekers to such inferior locations (and reduces their access to superior locations)? The answer appears to be uncertain because prior studies investigating geographic variations in discrimination—the fourth strand of literature we review—have only considered a few aspects of neighborhood context: ethnic composition and housing conditions.

The most consistent result (primarily arising out of U.S.-based investigations) has been that geographic variations in discrimination work to preserve the current racial/ethnic composition of the neighborhood, except in the case of mixed neighborhoods, where they work to increase the minority share. Using data from the 1989 U.S. HUD discrimination study, Ondrich, Ross and Yinger (2003) found that blacks were more likely to be favourably treated when examining properties in racially mixed neighborhoods, whereas Anglos were more likely to be favored in predominantly Anglo-occupied places. This finding was buttressed by Galster and Godfrey (2005), who identified patterns of “steering” in the U.S. HUD 2000 discrimination survey, whereby Anglos were provided gratuitous information by agents that encouraged them to finalize home sales when they searched in higher-valued, majority Anglo-occupied neighborhoods. Fisher and Massey (2004) found that phone-based discrimination against black apartment seekers in Philadelphia, PA was less likely if the dwelling was in a neighborhood of predominantly black residents but rose in likelihood as distance from such neighborhoods increased. Roychoudhury and Goodman’s (1992) Detroit, MI study also revealed that several forms of discrimination against blacks were inversely related to the percentage of black residents in the neighborhood in question. These results were replicated in the United Kingdom (Carlsson and Ericksson 2013) and Spain (Bosch, Carnero and Farre 2011). In his analysis of discrimination complaints in Cleveland, OH, Galster (1987b) similarly found that Anglos were more likely to be favored in majority-Anglo neighborhoods, but discrimination complaints were also prevalent in unstable neighborhoods in the midst of racial transition (also observed by Page, 1995). Likewise, Hanson and Hawley (2014) found that discrimination against blacks as measured by internet correspondence tests was more likely to occur in racially mixed neighborhoods, though the stability of such contexts was not measured. The only U.S.-based paired-tester study not observing a relationship between discrimination and neighborhood racial composition was by Ewens, Tomlin, and Wang (2014).

Fewer studies have examined spatial patterns of discrimination across non-racial/ethnic aspects of neighborhoods. Galster’s (1990) analysis of paired tests in Memphis, TN found that agents provided more favorable assistance and encouraging information to Anglo home seekers when properties where located in superior school districts. Choi, Ondrich and Yinger (2005), Zhao, Ondrich and Yinger (2005) and Hanson and Hawley (2014) found that blacks experienced elevated rates of discrimination in American neighborhoods with higher median incomes and rents.

Thus, while several studies offer evidence of geographic variation in differential treatment that seems to promote racial/ethnic segregation, the evidence is thin regarding the association between discrimination in housing and access to urban social goods (such as high-quality schools, low crime rates, public transportation and employment access) and the socio-economic and immigrant status of the neighborhood’s residents. Moreover, no such studies have been conducted in the context of an Australian housing market. The purpose of our study is to investigate this fundamental gap in the extant literature, and evaluate the relative contribution to the geography of rental housing discrimination in Sydney made by neighborhood ethnic, immigrant and socio-economic composition, alongside social goods. By inference, we hope to draw conclusions that link all strands of cited literature, suggesting how individual acts of differential treatment may systematically encourage residential segregation in one or more dimensions, and discovering whether such segregation is consistent with ethnically differentiated opportunities for social inclusion.

1. **Study site: The Sydney metropolitan region**

Sydney attracts the largest share of new migrants to Australia; over the decade 2001 to 2011, 73.5% of migrants to Sydney were from non-English speaking world regions. Sydney’s immigrants represent approximately 240 different language groups; forty percent of residents of the greater metropolitan area were born outside Australia, and one quarter spoke a language other than English at home. Several decades of immigration have resulted in an ethnically diverse population of native-born Australians. In this study, we focus on two ethnic minority groups, Indians and Muslim Middle-Easterners, who together make up just less than 6% of metropolitan Sydney’s population. They include both immigrants and the Australian born. As noted above, we study them because they typically are visible minorities who have reported high rates of discrimination in Sydney’s housing market.

The multiplicity of ethnicities in Sydney is reflected in a range of degrees and patterns of spatial segregation. Dissimilarity indices calculated for ethnic immigrant groups (based on language, both alone and combined with birthplace) from the 1996 census show that ethnic minorities representing recent refugee groups (for example, from Vietnam, Laos, or Cambodia) were highly segregated, while other longer-established ethnic minorities (for example, Mandarin or Cantonese speakers) were not. At the Census District level (the most fine-grained of census geographies, with fewer than 500 people), the dissimilarity index in 1996 for people born in India was 47.4, while for Arabic speakers it was 55.2 (Johnston, Forrest and Poulsen 2001). These were comparable to dissimilarity scores for people born in the Republic of Ireland (48.9) and Croatia (55.6).

In the absence of more recent research on Sydney’s residential segregation, we calculated an updated dissimilarity index for the two ethnic minorities included in this study, based on 2011 census data, at the postcode scale. The results suggest that ethnic segregation has worsened in the 15 years between censuses, with a Muslim Middle-Eastern dissimilarity index of 65.4, and a score of 60.7 for Indians.[[5]](#endnote-5) At the finer-grained scale of Census District equivalents, these indices would likely be considerably higher. Dissimilarity indices above 60 are conventionally seen as very high levels of segregation. There is also ample evidence of worsening economic and school-based segregation in Sydney (Randolph and Holloway 2005; Forster 2006; Cheshire et al 2014; Ho 2015; Hulse et al 2015). Baum and Gleeson’s (2010) analysis of the spatial distribution of relative deprivation finds that Sydney is far more sharply differentiated than other large Australian cities. Thus, Sydney represents a complex pattern of sharpening ethnic and economic segregation.

Australian housing ranks among some of the least affordable internationally (OECD 2015), and Sydney is the highest-priced Australian city. Median rents (but not mortgage payments) rose faster than median household incomes over the five-year period between the 2006 and 2011 censuses, while the proportion of renter households increased. Median rent-to-income ratios were 24.6% in 2011, a sharp increase from 21.7% in 2006. Unfortunately the Australian Census does not report rates of housing vacant and available for rent or sale, but a private data provider (SQM Research) estimates residential vacancy rates were only 1.7% for the greater metropolitan area in mid-2011 (they remained at about this level in the second half of 2013, when we conducted our study). Table 1 summarizes key housing market indicators for the Sydney metropolitan area.

Table 1

Sydney’s tight rental market, the increasing proportion of renters, and the increasing burden of rents on incomes, pose economic challenges for many lower-wage ethnic minority households and the new immigrants the metropolitan area attracts. To make matters worse, housing discrimination may be particularly virulent in markets with more intense competition for housing like Sydney’s, because discrimination is both less likely to result in lower profits and less likely to be detected (Yinger 1995).

In previous papers, we identified substantial incidences of ethnic-based differential treatment in the likelihood an agent will offer an individual appointment, will provide additional information about other housing, will provide additional information about completing the application form, and will make contact with a prospective renter after an inspection (MacDonald et al 2016). But here we ask: Does geographic variation in differential treatment in the rental housing market disproportionately restrict minorities’ housing choices in locations that arguably offer better prospects for social and economic mobility because of their predominantly Anglo populations, concentrations of residents of high socio-economic status, and/or better access to social goods?

1. **Data and methods**

*Overview of study design*

Our empirical analysis consists of four steps. The first step was measurement of differential treatment on the basis of ethnicity in the Sydney rental housing market using matched pair testing field methods and paired sample t-tests. Second, we summarized agents’ numerous discriminatory behaviors with an index of ‘encouragement to rent’ based on PCA. Third, we gathered data from official statistical sources on three sets of neighborhood characteristics related to ethnic/immigrant composition, resident socio-economic status, and social goods. Given the large number of measures in the last category, we again employed PCA to produce a manageable set of summary measures. Finally, we constructed an OLS model to explore the relative contribution of these three sets of neighborhood attributes to explaining variations in our composite discrimination measure of ‘encouragement to rent.’

*Measures of differential treatment in the rental market*

We investigated differential treatment in metropolitan Sydney’s rental markets using a paired tester study design,[[6]](#endnote-6) adapted from the well-known and accepted method used in the US Department of Housing and Urban Development’s periodic studies of discrimination in rental and owner-occupied housing (Oh and Yinger, 2015). The study was conducted over a 15-week period between August and November of 2013. Eighteen pairs of testers were formed, consisting of an Anglo-Australian, and either a person of Muslim Middle-Eastern origin (6 pairs) or Indian origin (12 pairs), matched on age, gender, and several other personal characteristics. The tester recruitment process aimed to screen applicants to ensure the pairs were matched on observable verbal, personality, and some physical attributes. While we did not set out to recruit students specifically, the jobs were advertised as “casual research assistant” positions, and thus were likely to attract the attention of people who were currently or had recently been involved in research. Six testers were completing a bachelor’s degree in a professional discipline (five of these in medicine), and the remaining testers had completed a bachelor’s degree, with most having an Honors, Master’s, or PhD. This relative socio-economic homogeneity is a strength of our study, because it restricted the analysis to ‘tenants’ with underlying socio-economic characteristics more likely to be seen as relatively ‘desirable’ by real estate agents.

Testers underwent training and attended follow up sessions during the study. Training was aimed at ensuring testers understood the importance of objectivity in completing the surveys, and that they were comfortable dealing with a variety of potential reactions or questions from real estate agents. Testers were assigned a family status (single, couple with no children, or couple with children) appropriate for the dwelling in each test, and an occupation that would offer an income appropriate to rent that property (these were equivalent for members of each test team). Rental properties were selected weekly from a commonly used, online real estate database (Domain.com), using a random sample of properties available in the Sydney metropolitan area (stratified by metropolitan census region).[[7]](#endnote-7) The web-site is commonly used by real estate agents to advertise available properties for rent or sale. Testers were randomly assigned rental properties, within the constraint that properties inspected each week would be within adequate travel distance (as most open inspections occurred within a relatively short time frame on a Saturday morning). For each test property, testers telephoned the listed agency to set up an individual inspection (if possible), and then attended the inspection in person (following one of a series of equivalent scripts).[[8]](#endnote-8) As with other paired testing studies, we were unable to continue the experiment to the application stage, given the legal ramifications of submitting fake rental applications. Testers completed detailed surveys about these interactions after each test stage. The outcome of each paired test for each variable measuring agent behavior was recorded as -1 (minority tester favored), 0 (neither tester favored) or +1 (Anglo tester favored). While 537 tests were initiated over the study period, both testers completed an inspection in 369 tests.[[9]](#endnote-9)

Table 2 presents a bivariate analysis of what we see as ten key dimensions of the tester-agent interactions at the phone call and inspection stages. Two-tailed, paired sample t-tests were performed to identify the dimensions on which the differences in treatment of the minority and Anglo testers were statistically significant. For eight of the dimensions Anglo testers were significantly more likely to be favored in ways that could be expected to materially advantage them in their housing searches. For example, the agent’s willingness to offer an individual appointment to inspect the property might provide the favored tester with an early opportunity to secure a lease, an especially valuable perquisite in a tight market.[[10]](#endnote-10) The agent’s willingness to discuss the housing needs of testers at the inspection, or to tell them of other vacant housing, would similarly result in their learning of household-appropriate available housing before other prospective renters. The further explanation of the application process included information such as the time at which the agent would start reviewing applications, the email address to which the application could be sent if completing it at the inspection was inconvenient, and which items of supporting information could be submitted later. Minority testers, on average, were significantly more likely to be favored on only two dimensions, and these seem less likely to materially improve their housing search outcomes. In previous research (MacDonald et al 2015) we analysed the Anglo- Indian and Anglo-Muslim Middle eastern differences, and found very similar patterns to those shown in Table 2 across both Anglo-minority pairings, suggesting similar experiences in the search for rental housing.

Table 2

*Specification of ‘encouragement to rent’ index*

If we were to analyse the geographic patterns of differential treatment for all ten of these individual dimensions it would not only be unwieldy but would violate the intuitive sense of the degree to which *holisticall*y the set of behaviors revealed in the paired test represented discrimination that favored Anglos. To secure this summary index that we use as the dependent variable in the OLS model, we entered the ten test outcomes (shown in Table 2) into a PCA, using Varimax rotation to derive clearly interpretable factors. The results indicated that the agents’ behaviors could be collapsed into four factors with Eigen values greater than one; higher values on each factor indicate a greater intensity of favouritism shown to the Anglo tester (See Table 3).

Table 3: Composite measure of ‘encouragement to rent’

Higher scores on the first factor indicate tests where agents more likely discussed the Anglo tester’s housing needs and told them of other housing. Higher scores on the second factor were tests where the agent more likely took the Anglo tester’s details and initiated contact after the inspection. Tests scoring higher on factor three indicate instances where the agent more likely explained the application form to the Anglo tester and provided further information about the application process. Finally, higher scores on factor four indicate tests where the agent more likely offered the Anglo tester an individual appointment to inspect the property, but was less likely to initiate casual conversation with the Anglo applicant.

Inasmuch as all of these factors may be considered elements of how agents might encourage a prospective customer, we summed the four factor scores to generate a composite score of the relative ‘encouragement to rent’ the members of the pair received, for each test. This score has an interval-level of measurement, and is designed to capture the multidimensional intensity and consistency of differential treatment that favors one group of testers or the other. Scores of ‘encouragement to rent’ ranged from -5.09 to 8.26, with a mean score of 0; higher positive (negative) values indicate the degree to which Anglo (minority) testers were favored on more items of encouragement.[[11]](#endnote-11) We standardized the variable and excluded four outlier cases to ensure that it satisfied assumptions of normality.

*Specification of neighborhood*

In our study we are seeking to operationalize “neighborhood” in spatial terms as it is used to mentally map and market rental housing submarkets. In this realm it is common in U.S. and international real estate advertising to use relatively large-scale delineations--postal code areas or even broader community names-- to categorize locations of advertised dwellings. . Much socio-spatial research in Australia, especially that focused on housing markets, uses postcode areas as a proxy for ‘neighborhood’ (see for example Edwards and Bromfield 2009; Corcoran et al 2010; Kulish et al 2012; Davidoff and Leigh 2013), and we follow this convention. The Australian Bureau of Statistics (ABS) reports census results at the fine-grained scale of the “mesh block,” then aggregates these blocks into postcodes and other statistical and political divisions. The average population in a Sydney postcode is 11,373, which offers a reasonable approximation of the concept of a real estate marketing neighborhood as something larger than a mesh block but smaller than a unit of local government. As a practical matter, using postcodes also provided two advantages. It simplified the identification of the location of each test property, because postcodes were often identified in the property advertisements and if not could be easily identified based on address data. Furthermore, some data relevant for our research (related to housing market conditions) are available by postcode but not by smaller Census geographic divisions.

*Measures of neighborhood-level attributes*

Our analysis includes three categories of neighborhood indicators: ethnic/immigrant composition; resident socio-economic status, and social goods.[[12]](#endnote-12) These serve as the independent variables in the OLS regression model. First, the percent of residents who are recent international migrants and the percent who belong to the minority ethnic groups we study, captures relative neighborhood-level demographic concentrations across the metropolitan area.[[13]](#endnote-13) The ABS Census of Population and Housing reports numbers of international migrants moving to Australia by time period (and their origin), but it does not gather information on the ethnic identity of any respondents. We used reported ancestry as a substitute for ethnicity.[[14]](#endnote-14)

The second category of neighborhood measures captures relative socio-economic status of residents through an index constructed by the ABS based on 2011 Census data, under the Socio-Economic Indexes For Areas (SEIFA) program. The Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD) is used as a basis for policy decisions about the distribution of funding and services. It is constructed by ABS staff using a PCA of a variety of Census measures of economic and social resources (Pink 2011, 3). The IRSAD is focused on where disadvantaged and advantaged people live, rather than on the social goods and other assets available in particular places; higher values indicate higher socio-economic ranking.

Finally, we employed several measures of neighborhood-level social goods. As measures of safety in the postcode, we included the burglary and property crime rates in the third quarter of 2013 (obtained from the NSW BOCSAR database, <http://www.bocsar.nsw.gov.au/Pages/bocsar_crime_stats/bocsar_crime_stats.aspx>). As measures of school quality we employ the mean 2009 score on standardised tests of numeracy and reading skills for year nine students in government schools (obtained under an agreement from the NAPLAN database, http://www.nap.edu.au/naplan/naplan.html). Economic opportunity in the postcode was captured by the overall employment rate (as a percentage of people aged 15 or over), the number of jobs within five kilometres of the postcode centroid in 2011, and the percent change in jobs within ten kilometres of the centroid between 2006 and 2011. We included two measures of transportation infrastructure assets, the percent of people commuting by public transit and by biking or walking (all of the above obtained from the 2011 ABS Census of Population and Housing).[[15]](#endnote-15) Because several of these social good variables were highly correlated (as we might expect), we needed to construct uncorrelated indicators. We again used PCA with Varimax rotation to improve the interpretability of the resulting factors. Table 4 summarises the results of the PCA of neighborhood social goods, along with descriptors of the variables.

Table 4: PCA of neighborhood social goods

Tests with higher scores on factor one indicate neighborhoods with higher crime rates, more jobs within five kilometers of the postcode centroid, and more commuting by biking and walking. We describe these as “higher crime, job-rich” neighborhoods. This factor weighs heavily on a desirable economic feature of neighborhoods (numbers of jobs), but high numbers of jobs also indicates concentrations of commercial and industrial land uses which might be perceived as reducing residential amenity. The factor also captures an unambiguously negative attribute, higher crime rates. Higher scores on factor two indicate neighborhoods with public schools whose students perform better on standardized tests (“higher quality schools”). Higher scores on factor three indicate neighborhoods where jobs within five kilometers of the postcode centroid have grown more rapidly over the last inter-census period; we label these “higher job growth” neighborhoods. Tests with higher scores on factor four were more likely to be located in neighborhoods characterized by higher proportions of people commuting by public transit, but lower rates of residents being employed (“lower employment, higher transit” neighborhoods). Again, this factor includes a potentially ambiguous mix of social goods: higher rates of public transit commuting indicate better infrastructure, but this does not appear to result in sufficiently better access to jobs to yield higher employment rates. Lower rates of employment may prove a disamenity among residents inasmuch as such neighbors will be inferior sources of information about potential job prospects. The mix of positive and negative features in two of these factors accurately captures Sydney’s particular ‘geography of opportunity:’ historic patterns of massive investment in radial rail mass transit, an emphasis on developing multiple employment clusters despite the continued dominance of the CBD, and more recent regulatory incentives to develop high density housing close to employment concentrations and transit nodes. The ambiguity introduced through the spatial juxtaposition of positive and negative attributes adds unavoidable complexity to interpreting our findings, as we amplify below.

In sum, factors 2 and 3 comprise unambiguous measures involving aggregations of only desirable social goods, whereas factors 1 and 4 comprise measures that have both desirable and undesirable social goods. As such, we would expect (based on statistical discrimination theory) that rental agents would more intensely encourage (i.e., discriminate in favor of) Anglos in “higher quality schools” and “higher job growth” neighborhoods, but our expectations are ambiguous for the “higher crime, job rich” and “lower employment, higher transit” neighborhoods.

1. **Results**

We explored, using OLS regression, the relative contribution made to explaining the composite index of ‘encouragement to rent’ by the aforementioned variables measuring the three categories of neighborhood attributes – ethnic / immigrant concentration, socio-economic composition, and social goods. The results of our analysis are shown in Table 5. Overall the model performed acceptably, with a high F-statistic and R-squared of .081. Though some measures of neighborhood context were correlated (see Appendix Table A), multicollinearity was not severe in our models (VIF measures are shown in Table 5).[[16]](#endnote-16) We adjusted for the spatial distribution of tests by estimating clustered robust standard errors based on the postcode location of the test. Certainly the modest R-squared indicates considerable unexplained variation in differential encouragement to rent exhibited by Sydney rental agents; nevertheless, some significant geographic patterns emerge while others, somewhat surprisingly, do not.

Table 5

*Relationship between differential treatment and neighborhood social goods*

Two of the four factors measuring neighborhood social goods proved predictive of differential treatment. “Encouragement to rent’ was significantly (and negatively) associated with “high crime, job rich” and “lower employment, high transit” neighborhoods. In these locations, agents provided relatively less encouragement to Anglo renters and more to minority renters. The magnitude of the effect was that a standard deviation-higher score on either of these social goods factors (numbers 1 and 4 in Table 4) was associated with, respectively, a .28 and a .30 standard deviation–lower intensity (greater intensity) of differential treatment favoring Anglos (minorities). Of note, our index of differential treatment was not significantly positively related either to neighborhoods with higher quality schools or those with higher rates of job growth (factors 2 and 3), as was predicted.

Our results suggest that agents systematically discourage Anglos (and encourage minorities) to rent dwellings in neighborhoods characterised by inferior levels of some social goods: those with higher crime rates and lower employment rates. However, those neighborhoods are also likely to have higher proportions of residents commuting by transit or by biking and walking, and higher numbers of jobs nearby. We reiterate that these contrary elements of social goods factors 1 and 4 render our interpretations about the consequences of geographic patterns of discrimination ambiguous. Higher rates of non-car travel may be interpreted as the presence of better public transport alternatives, or as reduced access to cars by the local populace. Higher numbers of proximate jobs may be interpreted as access to richer employment opportunities, or as locations with more commercial and industrial land uses and associated reductions in environmental quality.

*Relationship between differential treatment and neighborhood ethnic, immigrant and socio-economic characteristics*

Remarkably, we did not find any evidence that ‘encouragement to rent’ was associated with neighborhood socio-economic status measured by IRSAD rank. However, the index was significantly negatively associated with the percentage of Indian-origin residents. Net encouragement of Anglo renters is .12 standard deviations less (and equivalently the encouragement of minority renters is greater) when the property in question is located in a post code with a standard deviation higher percentage of Indian-origin residents than when it is located in an otherwise-identical area with an equivalently higher percentage of Anglo-Australians instead of Indian residents.

More surprisingly, net encouragement of Anglo renters is significantly positively associated with the post code’s percentage of recent international migrants. This result indicates that net encouragement of Anglo renters is .34 standard deviations greater (and for Indian and Muslim Middle-Eastern renters equivalently lower) for every one standard deviation-higher percentage of recent immigrants in the neighborhood. We probed this unexpected result further and discovered that it was produced by an idiosyncrasy of Sydney’s spatial pattern of immigration. Places where high rates of recent immigration yielded high intensity of Anglo encouragement to rent were also places scoring highly on the “good schools” dimension of social goods (factor 2) that also exhibited high rates of recent immigration by higher-status Chinese. We suspect that rental agents may not care about the neighborhood’s total share of recent immigrants as much as the national origin and socioeconomic status of immigrants in the particular neighborhood in question. Unfortunately, our data are insufficiently robust to probe this further. We thus urge caution in over-interpreting this finding.

1. **Discussion**

*The potential motives for discrimination*

Because we observed distinctive geographic variations in the intensity of rental housing discrimination in Greater Sydney we can draw upon the aforementioned theory to make inferences about what might be motivating rental agents in aggregate to commit discriminatory acts. We believe that our results provide more support for the statistical discrimination theory than the customer prejudice theory, while rejecting the agent prejudice theory. Rental agents as a group appear to believe that one ethnic group is more likely to consummate rental transactions in particular neighborhood contexts distinguished by their ethnic composition and by bundles of certain social goods. For example, agents apparently believe based on their prior experience that minorities would be more likely than Anglos to rent in (and perhaps even pay a premium for) neighborhoods with close proximity to work, good transit connections, and higher shares of minority residents. This support is qualified, however, by the fact that discrimination did not vary by other dimensions of social goods and socioeconomic status. Nevertheless, it is noteworthy that several U.S.-based studies also found support for the statistical discrimination theory (e.g., Ewens, Tomlin, and Wang, 2014; Oh and Yinger, 2015) employing a similar analytical strategy as ours. By contrast, we find mixed, unconvincing support for the customer prejudice theory. As would be predicted from this perspective, encouragement of minorities to rent in more heavily Indian-occupied neighborhoods would seemingly cater to Anglo tenants’ ethnic prejudices and work to preserve predominantly Anglo-occupied neighborhoods (or rental buildings). However, if catering to Anglos’ presumed ethnic and class prejudices were indeed the dominant motivator for discrimination, we would expect to see a more consistent and robust pattern of negative coefficients for variables measuring the percentages of Muslim-Middle Eastern and recent immigrant residents, which we did not observe.

*The Geography of Discrimination, Segregation, and Economic Opportunity*

Our results about the systematically varied geography of rental discrimination in Greater Sydney are unambiguous. Differential treatment discrimination practiced by rental agents is associated with clear geographical differences in neighborhood ethnic composition and some kinds of social goods. One consequence of this observed variation is also clear: enhanced ethnic segregation. Our result that minorities are more likely than Anglos to be encouraged to rent in neighborhoods with higher percentages of Indian-origin residents indicates that discrimination in Sydney’s rental market abets the sorting of minority and Anglo apartment seekers in a geographic fashion that increases segregation of ethnic groups. Independent of its relationship to access to desirable social goods, residential segregation itself can be seen as a vehicle for social exclusions and perpetuating ethnic inequalities.

The second consequence of the observed geographic variation in discrimination in Sydney is less clear due to the mixed bundle of desirable and undesirable social goods present in the neighborhoods in which minorities are differentially encouraged to rent. Specifically, we find consistent evidence that patterns of differential treatment work to direct Indian and Muslim Middle-Eastern renters into two types of neighborhoods that jointly exhibit: lower percentages of employed residents, higher crime rates, more proximate jobs, and higher percentages of commuting by bike, walking or transit. In the “high crime, job rich” (factor 1) neighborhoods, high numbers of jobs within five kilometers clearly make biking and walking to work feasible. The “low employment, high transit” neighborhoods (factor 4) has transit usage figures indicating well-connected locales. Of course, all is not rosy in such places despite these desirable social goods. Job concentrations are, unfortunately but unsurprisingly, associated with higher rates of burglaries and property crime (Raleigh and Galster 2014) and a mix of residential and non-residential uses that may degrade other aspects of quality of life. Places served best by public transit in Sydney also have residents who are less likely to be employed, thereby offering weaker local networks for providing bridging social capital. Thus, we cannot say from our results what the net effect the varied geography of rental housing discrimination in Sydney has on minorities’ access to desirable social goods. The importance of this potential causal path between discrimination and social exclusion therefore remains uncertain.

What our explorations did not find is also important to discuss. We observed no relationship between the intensity of differential treatment and either the “high quality schools” or “high job growth” dimensions of neighborhood social goods (factors 2 and 3). Our predictions that Anglos would experience more favoritism from rental agents that would encourage them to rent in such clearly superior locales were not borne out. Furthermore, we observed no relationship between the intensity of differential treatment and the socio-economic status of neighborhoods, thus providing no support for a hypothesis that discrimination in Sydney’s rental housing market exacerbates economic segregation of households. We suspect that the increasing concentration of low-rent housing is a more prominent cause of this phenomenon.

In concert, our findings from Sydney may be contrasted to the aforementioned scholarly work originating in the U.S., wherein housing discrimination was linked statistically to increasing interracial socio-economic inequalities via the mediating factor of intensified racial/ethnic residential segregation. We observed a similar link between discrimination and ethnic segregation, but did not observe that this led to unambiguously inferior consumption of social goods by minorities; rather, these social goods represent a mixed bundle of desirable and undesirable attributes whose net effects on opportunities we are in no position to judge.

*Caveats and Future Directions*.

First, we caution that our findings are applicable only to one metropolitan area at one period in time. Second, the ambiguous results regarding the mixed bag of attributes in neighborhoods to which minorities are directed via discrimination may be a product of the idiosyncratic history of Greater Sydney. Investments in public transit, regulations encouraging development of higher density housing in close proximity to jobs and transit, and growth of suburban employment centers may have combined to create more equal access to economic opportunity for a wide swath of the Sydney citizenry than is present in many other metropolitan areas (especially in the U.S.). Third, our paired testing field work only sampled one segment of the Greater Sydney housing market: rental dwellings that are advertised for rent on one internet site (Domain.com); discrimination patterns may be different in the less professional, smaller-scale rental sector and for properties that are advertised through other media. Fourth, we investigated the geography of discrimination at the scale of the postcode area, which on average houses over twice the population of a U.S. census tract. Though this scale is appropriate given the real estate advertising practices and data sources in Sydney, it is possible that discrimination may vary across smaller spatial scales that we were unable to detect. Fifth, we investigated rental discrimination directed against two minority groups in Sydney, but of course other groups may confront considerably different discriminatory barriers. Sixth, we have not considered discrimination in the for-sale housing market, which may operate quite differently than the rental market and evince distinctive geographic patterns.

We would caution against misinterpreting our findings. By discovering that rental discrimination directs Muslim-Middle Eastern and Indian minorities to places that have a mixture of desirable and undesirable social goods, we are not suggesting that all neighborhoods in Sydney offer equally viable launching pads for upward social mobility. Similarly, we are not implying that discrimination’s observed abetting of ethnic segregation has no socioeconomic consequences. On the contrary, there is ample evidence that Sydney is becoming a city of increasingly unequal opportunities (Birrell and Healy 2003; Randolph and Holloway 2005; Forster 2006; Baum and Gleeson 2010; Cheshire et al 2014). We would also note with concern the rising concentration of disadvantaged households of many ethnicities in several suburban areas of Sydney (Hulse et al. 2015), even though we could not identify rental discrimination as a source of this phenomenon. In addition, we are not implying that the observed discrimination in the rental market of Sydney is of no concern beyond its effects on the locations of different ethnic groups.

Several directions for further research in this area follow from the prior discussion of study limitations. To get a more comprehensive portrait of the degree to which ethnically based housing discrimination affects the geography of opportunity in Australia we need more, and farther-ranging investigations of discrimination using paired testing methods. Our study should be viewed as a prototype. Moreover, identifying the spatial variations in discrimination does not in itself quantify the degree to which housing seekers’ actual residential selections are affected. Such research would need to combine large-scale, paired-testing-based data on discrimination with other information about actual residential mobility patterns. Finally, more clarity about how discrimination shapes social exclusion would require studies that quantify the impact on socioeconomic opportunities of ethnic segregation and access to the particular social goods employed here.

1. **Conclusions**

We used in-person paired testing to investigate whether the intensity of discrimination in Sydney’s rental housing market directed against Indian and Muslim Middle-Eastern minority groups varied geographically and, if so, whether this variation promoted ethnic segregation, economic segregation, and/or differential access to desirable social goods. We found that there was substantial geographic variation in the intensity of discrimination that promoted ethnic, but not economic, segregation. Relative to their Anglo counterparts, minority testers were more strongly encouraged to rent in locations characterized both by undesirable social goods such as higher crime and lower employment rates but also characterized by desirable social goods such as greater density of proximate employment and greater feasibility to commute by walking, cycling or public transit.

Thus, the geography of discrimination we identified is worrisome on the grounds that it abets social exclusion via encouraging ethnic segregation. It does not, however, result in clear and simple differences in access to an unambiguously desirable bundle of social goods. We suspect that the idiosyncrasies of Sydney’s metropolitan planning and development history provide the primary explanation for our mixed findings related to social goods.

**References**

Ahmed, A.M., & Hammarstedt, M. (2008). Discrimination in the Rental Housing Market:

A Field Experiment on the Internet. *Journal of Urban Economics,* 64(2), 362–372.

Andersson, L., Jakobsson, N., & Kotsadam, A. (2012). A Field Experiment of Discrimination in the Norwegian Housing Market: Gender, Class, and Ethnicity. *Land Economics*, 88, 233-240.

Armor, D. (1995). *Forced Justice: School Desegregation and the Law.* NY and Oxford: Oxford University Press.

Baldini, M., & Federici, M. (2011). Ethnic Discrimination in the Italian Housing Market. *Journal of Housing Economics,* 20(1), 1-14.

Baum, S., & Gleeson, B. (2010). Space and place: social exclusion in Australia’s suburban heartland. *Urban Policy and Research,* 28(2), 135-159.

Birrell, B., & Healy, E. (2003). Metropolis divided: the political dynamic of spatial inequality and migrant settlement in Sydney. *People and Place*, 11(2), 65-87.

Booth, A., Leigh, A., & Varganova, E. (2011). Does Ethnic Discrimination Vary across

Minority Groups? Evidence from a Field Experiment. *Oxford Bulletin of Economics and*

*Statistics,* 74(4), 547–573.

Bosch, M., Carnero, M.A., & Farré, L. (2011). *Rental housing discrimination and the persistence of ethnic enclaves*. Discussion paper series Forschungsinstitut zur Zukunft der Arbeit, No. 5583, retrieved from <http://nbn-resolving.de/> urn:nbn:de:101:1-201104134055

Carlsson, M., & Eriksson, S. (2013). *Ethnic Discrimination in the Market for Shared Housing*. Working paper series, Linnaeus University Centre for Labour Market and Discrimination Studies, 2013:5 Retrieved from [http://www.diva-portal.org/smash/get/diva2:677180/FULLTEXT01.pdf](http://www.diva-portal.org/smash/get/diva2%3A677180/FULLTEXT01.pdf)

Chang, V. (2006). Racial residential segregation and weight status among US adults. *Social Science and Medicine,* 63, 1289-1303.

Cheshire, L., Pawson, H., Easthope, H., & Stone, W. (2014). *Living with place disadvantage: community, practice and policy*. Melbourne, VIC: Australian Housing and Urban Research Institute.

Choi, S.J., Ondrich, J., & Yinger, J. (2005). Do rental agents discriminate against minority customers? Evidence from the 2000 Housing Discrimination Study. *Journal of Housing Economics,* 14(1), 1–26.

Clark, W.A.V. (1986). Residential segregation in American cities: a review and interpretation. *Population Research and Policy Review*, 5, 95-127.

Clark, W.A.V. (1988). Understanding residential segregation in American cities: Interpreting the evidence, a reply to Galster, *Population Research and Policy Review* 7, 113–121.

Clark, W.A.V. (1989). Residential segregation in American cities: Common ground and differences in interpretation. *Population Research and Policy Review*, 8, 193–197.

# Clark, W.A.V (1993). Measuring racial discrimination in the housing market: Direct and Indirect Evidence. Urban Affairs Review*,* 28(4), 641-649.

Clark, W.A.V. (2007). Race, class, and place: evaluating mobility outcomes for African Americans. *Urban Affairs Review*, 42(3), 295-314.

# Clark, W.A.V. & Morrison, P. (2008). Evaluating evidence of discrimination in multiethnic housing markets. *Population Research and Policy Review,* 27(3), 353–366.

Corcoran, J., Faggian, A. & McCann, P. (2010). Human Capital in Remote and Rural Australia: The Role of Graduate Migration. *Growth and Change*, 41, 192–220.

Cutler, D., & Glaeser, E. (1997). Are ghettos good or bad? *Quarterly Journal of Economics,* 112(3), 827-872.

Davidoff, I. & Leigh, A. (2013). How do stamp duties affect the housing market?. *Economic Record*, *89*(286), 396-410.

Dunn, K., Forrest, J., Pe-Pua, R., Hynes, M. & Maeder-Han, K. (2009). Cities of race hatred? The spheres of racism and ant-racism in contemporary Australian cities. *Cosmopolitan Civil Societies,* 1 (1): 1-14.

Dunn, K.M., Gandhi, V., Pelleri, D., & Maeder-Han, K. (2011). Racism in the tertiary education sector: a case of Indian student attacks in Australia. *Geography Bulletin,* 43 (3): 7-16.

Edwards, B., & Bromfield, L.M. (2009). Neighborhood influences on young children’s conduct problems and pro-social behaviour: evidence from an Australian national sample. *Children and Youth Services Review*, 31, 317-324.

Ewens, M., Tomlin, B., & Wang, L.C. (2014). Statistical discrimination or prejudice? A large sample field experiment. *Review of Economics and Statistics,* 96(1), 119-134.

Fisher, M., & Massey, D. (2004). The ecology of racial discrimination. *City and Community,* 3, 221-241.

Forster, C. (2006). The challenge of change: Australian cities and urban planning in the new millennium. *Geographical Research*, 44(2), 173-182.

Galster, G. (1987a). Residential segregation and interracial economic disparities: A simultaneous equations approach. *Journal of Urban Economics,* 21(1), 22-44.

Galster, G. (1987b). The ecology of racial discrimination in housing. *Urban Affairs Quarterly,* 23, 84-107.

Galster, G. (1988). Residential segregation in American cities: a contrary review. *Population Research and Policy Review*, 7, 93-112.

Galster, G. (1989). Residential segregation in American cities: A further response to Clark. *Population Research and Policy Review*, 8, 181-192.

Galster, G. (1990). Racial steering by real estate agents: Mechanisms and motivations. *Review of Black Political Economy,* 19, 39-63.

Galster, G. (1991). Housing discrimination and urban poverty of African-Americans. *Journal of Housing Research,* 2(2), 87-120.

Galster, G. (1995). Minority Poverty: The Place-Race Nexus and the Clinton Administration's Civil Rights Policy. In C. Yu & W. Taylor (Eds.), *New Challenges: The Civil Rights Record of the Clinton Administration Mid-Term* (pp. 31-56). Washington, DC: Citizens' Commission on Civil Rights.

Galster, G., & Godfrey, E. (2005). By words and deeds: Racial steering by real estate agents in the U.S. in 2000. *Journal of the American Planning Association,* 71(3), 1-19.

Galster, G., & Keeney, M. (1988). Race, residence, discrimination, and economic opportunity. *Urban Affairs Quarterly,* 24, 87-117.

Galster, G. & Santiago, A.M., 2017. Neighbourhood ethnic composition and outcomes for low-income Latino and African American children. *Urban Studies*, 54(2), 482-500.

Hanson, A. & Hawley, Z. (2014). Where does racial discrimination occur? An experimental analysis across neighborhood and housing unit characteristics. *Regional Science and Urban Economics,* 44, 94–106.

Heckman, J. (1998). Detecting Discrimination. *Journal of Economics Perspectives*, 12, 101-116.

Heckman, J., & Siegelman, P. (1993). The Urban Institute Audit Studies: Their Methods and Findings. In Fix, M. E., and Struyk, R. J. (Eds.), *Clear and Convincing Evidence: Measurement of Discrimination in America* (pp. 187-258). Washington, DC: Urban Institute Press.

Ho, C. (2015). ‘People like us’: School choice, multiculturalism and segregation in Sydney. Australian Review of Public Affairs (August). Retrieved from <http://www.australianreview.net/digest/2015/08/ho.html>

Hulse, K., Pawson, H., Reynolds, M., & Herath, S. (2015). *Disadvantaged places in urban Australia: Analysing socio-economic diversity and housing market performance*. Canberra: Australian Housing and Urban Research Institute.

Johnston, R., Forrest, J., & Poulsen, M. (2001). The geography of an EthniCity: residential segregation of birthplace and language groups in Sydney, 1996. *Housing Studies*, 16(5), 569-594.

Kain, J.F. (1992). The spatial mismatch hypothesis: three decades later. *Housing Policy Debate,* 3(2), 371-460.

Kramer, M., & Hogue, C. (2009). Is Segregation Bad for Your Health? *Epidemiolic Review,* 31(1), 178-194.

Kulish, M., Richards, A. & Gillitzer, C., (2012). Urban structure and housing prices: Some evidence from Australian cities. *Economic Record*, *88*(282), 303-322.

Lee, M., & Ferraro, K. (2007). Neighborhood residential segregation and physical health among Hispanic Americans: Good, bad, or benign? *Journal of Health and Social Behavior*, 48(2), 131-148.

Levitas, R., Pantazis, C., Fahmy, E., Gordon, D., Lloyd, E., & Patsios, D. (2007). *The multi-dimensional analysis of social exclusion*. Project Report. University of Bristol, Bristol. Retrieved from <http://hdl.handle.net/10552/1781>.

MacDonald, H., Nelson, J., Galster, G., Paradies, Y., Dunn,K., & Dufty-Jones, R. (2016). Rental discrimination in the multi-ethnic metropolis: evidence from Sydney. *Urban Policy and Research*, 34(4), 373-385.

MacDonald, H., Nelson, J., Dunn, K., & Dufty-Jones, R. Paradies, Y. (2015). Discrimination in the multi-ethnic metropolis: evidence from Sydney. *Australasian Housing Researchers Conference, Hobart, Tasmania, February* (available from the authors on request).

Massey, D.S., & Denton, N.A. (1993). *American apartheid: Segregation and the making of the underclass*. Cambridge MA: Harvard University Press.

Nelson, J., MacDonald, H., Dufty-Jones, R., Dunn, K., & Paradies, Y. (2015). Ethnic discrimination in private rental housing markets in Sydney. In R. Dufty-Jones & D. Rogers (Eds.) *Housing in Twenty-First Century Australia: People, Practices and Policies*, (pp. 39-56). Ashgate: Aldershot

Nelson, K. (2013). Does residential segregation help or hurt? Exploring differences in the relationship between segregation and health among U.S. Hispanics by nativity and ethnic subgroup. *The Social Science Journal,* 50, 646-657.

OECD (2015) *Economic outlook, analysis and forecasts: focus on house prices*. Retrieved from <http://www.oecd.org/eco/outlook/focusonhouseprices.htm>.

Oh, S., & Yinger, J. (2015). What have we learned from paired testing in housing markets? *Cityscape,* 17(3), 15-59.

Ondrich, J., Ross, S., & Yinger, J. (2003). Now you see it, now you don't: Why do real estate agents withhold available houses from black customers? *Review of Economics and Statistics*, 85(4), 854-873.

Page, M. (1995). Racial and ethnic discrimination in urban housing markets: Evidence

from a recent audit study. *Journal of Urban Economics,* 38, 183-206.

Pink, B. (2011). *Socio-Economic Indexes for Areas (SEIFA): Technical paper*. ABS Catalogue no. 2033.0.55.001. Canberra: Australian Bureau of Statistics

Price, R. & Mills, E. (1985). Race and residence in earnings determination. *Journal of Urban Economics,* 17(1), 1-18.

Raleigh, E., & Galster, G. (2014). Neighborhood Disinvestment, Abandonment and Crime Dynamics. *Journal of Urban Affairs,* 37(4), 367-396.

Randolph, B., & Holloway, D. (2005). Social disadvantage, tenure and location: an analysis of Sydney and Melborne. *Urban Policy and Research*, 23(2), 173-201.

Roychoudhury, C., & Goodman, A. (1992). An ordered probit model for estimating racial discrimination through fair housing audits. *Journal of Housing Economics,* 2, 358-373.

Santiago, A.M., & Galster, G. (1995). Puerto Rican Segregation in the U.S.: Cause or Consequence of Economic Status. *Social Problems,* 42(3), 361-89.

Singh, S. (2011). Indian students in Melbourne: challenges to multiculturalism, *Journal of Intercultural Studies* 32 (6): 673-689.

Turner, M., Levy, D., Wissoker, D., Aranda, C., Pitingolo, R., & Santos, R. (2013).*Housing Discrimination Against Racial And Ethnic Minorities 2012.* Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.

Turner, M., Ross, S., Galster, G., Yinger, J., with Godfrey, E., Bednarz, B., Herbig, C., & Lee, S. (2002). *Discrimination in Metropolitan Housing Markets: National Results from Phase I HDS 2000*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.

Turner, M., Struyk, R., & Yinger, J. (1991). *Housing Discrimination Study: Synthesis*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.

Wienk, R., Reid, C., Simonson, J., & Eggers, F. (1979). *Measuring Racial Discrimination in American Housing Markets: The Housing Market Practices Survey*. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.

Yinger, J.M. (1995). *Closed Doors, Opportunities Lost: The Continuing Costs of Housing Discrimination*. New York: Russell Sage Foundation.

Yinger, J. (1998). Evidence on discrimination in consumer markets, *The Journal of Economic Perspectives*, 12(2), 23-40.

Zhao, B., Ondrich, J., & Yinger, J. (2005). *Why Do Real Estate Brokers Continue to Discriminate? Evidence from the 2000 Housing Discrimination Study*. Working Paper 96, Syracuse, NY: Maxwell School Center for Policy Research, Syracuse University.

**Author Biographies**

**Heather MacDonald** earned her PhD in urban policy and planning from Rutgers University. She is professor of planning and head of the School of Built Environment at the University of Technology Sydney. She has published widely on housing policy and finance, spatial analysis, and urban governance.

**George Galster** earned his PhD in economics from the Massachusetts Institute of Technology (MIT) and now serves as Clarence Hilberry Professor of Urban Affairs at Wayne State University. He has published 145 peer-reviewed articles, eight books, and 35 book chapters on a wide range of urban topics. The Urban Affairs Association placed him on their “Service Honor Roll” in 2014 and awarded him the “Contributions to the Field of Urban Affairs” prize in 2016.

**Rae Dufty-Jones** is a Lecturer in Geography and Urban Studies. Before joining UWS in February 2010, Rae had previously worked at the University of New England (2008-2010) after completing her PhD at the University of New South Wales (2008). Her research interests include: governance and neoliberalism; migration and housing policy; urban development challenges and policies; the restructuring of horticultural industries in Australia; and ethnic diversity in Australian rural communities and issues of racism.

Table 1: Key Housing market indicators for the Greater Sydney metropolitan area, 2006 -2011

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | 2011 | Change 2006 to 2011 |
| Percent renters | 31.6 | 6.40% |
| Median household weekly income | $1447 | 25.39% |
| Median monthly mortgage payment | $2167 | 20.39% |
| Median weekly rent | $351 | 40.40% |
| Median rent as % household income | 24.26 | 12.00% |

Source: Australian Bureau of Statistics, Census of Population and Housing 2006 and 2011, Community Profile

Table 2: Incidences (% of Tests) of Differential Treatment, by Behavior

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  Minority favored | Neither favored  | Anglo favored   | Net Anglo-Minority favored |
| Tester offered individual appointment on phone | 3.5 | 79.7 | 16.8 | 13.3\*\*\* |
| Agent asked about tester’s housing needs | 3.3 | 83.5 | 13.3 | 10.0\*\*\* |
| Tester told of other housing | 7.0 | 66.1 | 26.8 | 19.8\*\*\* |
| Tester told of restricted number of occupants | 0.8 | 98.9 | 0.3 | .318 |
| Tester told all must sign lease | 16.3 | 81.8 | 1.9 | -14.4\*\*\* |
| Agent took tester details | 13.6 | 80.2 | 6.2 | -7.4\*\* |
| Agent explained application form | 16.5 | 59.1 | 24.4 | 7.9\* |
| Agent provided further information about application process | 7.9 | 68 | 24.1 | 16.2\*\*\* |
| Agent had casual conversation with tester | 5.4 | 76.4 | 18.2 | 12.8\*\*\* |
| Agent contacted tester after inspection | 4.3 | 84.8 | 10.8 | 6.5\*\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Source: Calculated by the authors based on study dataNotes: \*\*\* = p<.000; \*\* = p< .01; \*=p<.05 |

Table 3: Composite Measure of encouragement to rent

|  |
| --- |
| Dimension of differential treatment  |
| 1 | 2 | 3 | 4 |
| Tester offered individual appointment on phone | .267 | -.181 | .079 | .727 |
| Agent asked about tester’s housing needs | .715 | .289 | .027 | -.021 |
| Tester told of other housing | .706 | -.140 | .021 | .059 |
| Tester told of restricted number occupants | .032 | -.027 | -.177 | .002 |
| Tester told all must sign lease | -.117 | -.022 | .269 | -.018 |
| Agent took tester details | .160 | .741 | -.126 | .248 |
| Agent explained application form  | -.018 | .041 | .821 | .196 |
| Agent provided further information about application process | .089 | -.093 | .612 | -.264 |
| Agent had casual conversation with tester | .352 | -.203 | .150 | -.633 |
| Agent contacted tester after inspection | -.088 | .711 | .067 | -.296 |
|  |  |  |  |  |
| Source: Calculated by the authors based on study dataNotes: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization |

Table 4: Descriptors and principal components of neighborhood social resources

|  |  |  |
| --- | --- | --- |
| Normalised scores |   | Component |
| Postcode Mean (Median) | 1 | 2 | 3 | 4 |
| Property crime rate (per 1000 population) 3rd quarter 2013 | 4.1/1000 (3.55/1000) | .973 | -.059 | -.034 | .033 |
| Burglary rate (per 1000 population) 3rd quarter 2013 | 1.8/1000 (1.58/1000) | .938 | -.103 | -.099 | .088 |
| Percent residents in labor force and over 15 years employed 2011 | 94.4% (94.8%) | -.069 | .359 | .475 | -.629 |
| Percent change in jobs within 5km postcode centroid, 2006 to 2011 | 3.8% (2.96%) | .138 | -.076 | .893 | .083 |
| Mean score on reading tests for year 9 students in government schools, 2009 | 591 (597) | .091 | .962 | .018 | -.046 |
| Mean score on numeracy tests for year 9 students in government schools, 2009 | 610 (610) | -.027 | .944 | -.040 | .076 |
| Number of jobs within 5 KM postcode centroid, 2011 | 110056 (49,750) | .836 | .082 | .383 | .066 |
| Percent employed residents commuting by bike or walking, 2011 | 7% (4.1%) | .840 | .215 | .178 | .133 |
| Percent employed persons commuting by public transit 2011 | 26.6% (26.2%) | .143 | .163 | .208 | .861 |

Source: Calculated by the authors from data obtained from ABS Census of Population and Housing 2006; 2011; NAPLAN 2009; BOSCAR 2013

Notes: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization

|  |  |
| --- | --- |
| Table 5 | Encouragement to Rent: association with neighbourhood characteristics |
|  |  |  |  |  |
|  | Beta | t | Sig. | VIF |
| Higher crime job-rich | -.258 | -4.390 | .000 | 1.520 |
| Higher school quality | -.010 | -.140 | .887 | 1.818 |
| Higher job-growth | .100 | 1.450 | .149 | 1.954 |
| Lower employment, higher public transit | -.274 | -2.82 | .006 | 3.399 |
| Percent Muslim Middle-Eastern | .067 | 1.340 | .183 | 2.085 |
| Percent Indian | -.120 | -2.030 | .045 | 1.789 |
| Percent recent international migrants | .305 | 3.230 | .002 | 4.037 |
| IRSAD rank | -.000 | -1.490 | .140 | 3.726 |
| Constant |   | 1.370 | .175 |   |
|  |   |   |   |   |
| F-score | 4.98 |   |   |   |
| Sig.  | .000 |   |   |   |
| N | 339 |   |   |   |

Source: Calculated by the authors based on study data

Note: Clustered robust standard errors calculated by postcode location of test.

Endnotes

1. With one exception: Galster (1990) investigated how steering reduced minority households’ access to better-quality schools. [↑](#endnote-ref-1)
2. A completed test for the purposes of assessing whether differential housing offers were made involved each member of the tester pair completing a phone call to the agent and an inspection of a property; for the purposes of assessing whether differential encouragement to rent occurred a completed test further required both testers to inspect the dwelling in question. [↑](#endnote-ref-2)
3. The personal prejudice of an individual rental agent (expressed as an aversion to dealing with minority customers manifested as discriminatory treatment) should not systematically vary according to where the dwelling being offered is located. [↑](#endnote-ref-3)
4. The customer prejudice hypothesis as applied to the sales housing market suggests that Anglo real estate agents who depend upon commissions for their livelihood are less likely to show minority home seekers options in predominantly Anglo-occupied neighborhoods and/or near the agent’s office for fear of alienating potential Anglo customers who might use them as buyer or seller agents in the future. [↑](#endnote-ref-4)
5. In this study, which focuses on ethnic minority groups rather than immigrant groups, we use an ancestry-based definition of ethnicity described in endnote x below, rather than Johnston, Forrest and Poulsen’s (2001) language spoken at home and birthplace definition. [↑](#endnote-ref-5)
6. Critics of the audit method of estimating discrimination have argued that the method is flawed by the fundamental difficulty of accurately matching pairs of testers. Most critiques of the method have been raised in studies of employment, rather than housing, discrimination. Heckman (1998) and Heckman and Siegelmann (1993) argue that prospective employers make judgements about an individual’s suitability for a job based on underlying factors that are unlikely to be adequately controlled in the choice of tester pairs. While controlling for underlying tester characteristics is clearly an important consideration, it is unclear that the problem is equally crucial in housing discrimination studies. Prospective employers are likely to care about a far wider array of personal characteristics of their employees than real estate agents (personality, fit with corporate culture, communication skills, team work and leadership, among many others). Nevertheless, we designed the tester recruitment, screening, and training process to minimise this problem, as explained in the text. [↑](#endnote-ref-6)
7. There are 326 postcodes in the Greater Sydney metropolitan area; because we sampled by region, based on which properties were available for rent each week, we tested dwellings in 104 of these postcodes. The highest number of tests in an individual postcode was 17, for a location with a very high proportion of rental housing. [↑](#endnote-ref-7)
8. We tested for differences in treatment during the phone conversation stage that might be related to the order in which the testers spoke to the agent, and found no significant differences. Most tests were conducted with both testers visiting the same 15 or 20 minute public inspection – the order in which testers attended these inspections is unlikely to significantly affect our results, and we find no significant differences in whether the Anglo or the minority tester reported they were told the property had been rented. [↑](#endnote-ref-8)
9. The disparity reflects the speed at which properties were rented – in all except ten cases of incomplete tests, inspections were not completed because the property was no longer available. Overall, Anglo-Muslim Middle-Eastern test pairs completed 165 phone enquiries, of which 107 inspections were completed; Anglo-Indian test pairs completed 408 phone enquiries, of which 261 inspections were completed. [↑](#endnote-ref-9)
10. This was a likely outcome; 158 of the total 537 tests did not advance from the phone call to the inspection stage because the property had been rented before the advertised inspection time. [↑](#endnote-ref-10)
11. In supplemental analyses we experimented with using the individual factors as dependent variables in our OLS models. These experiments broadly confirmed the conclusions provided in the paper but added no additional insights. We therefore report the simpler and more straightforward results provided by our single, ‘encouragement to rent’ index. [↑](#endnote-ref-11)
12. We did not include housing vacancy rates in the final version of the model. Housing vacancy rates (a measure of ‘dwellings available for rent or sale,’ from a private real estate information service as the Australian Census does not report vacancy rate data) were included in previous versions of PCA analyses of neighbourhood attributes. Postcode-level vacancy rates varied from 0.4 percent to 5.0 percent across the metropolitan area at the time of the study. Given we had reservations about the provenance and appropriateness of this data, and because it behaved inconsistently in analyses, we excluded it from the final PCA. [↑](#endnote-ref-12)
13. We excluded percent Anglo residents from the final model because it was correlated with percent recent migrants. [↑](#endnote-ref-13)
14. The category Muslim Middle-Eastern included people reporting their ancestry as: Arab; Algerian; Egyptian; Iraqi; Jordanian; Kuwaiti; Lebanese; Libyan; Moroccan; Palestinian; Saudi Arabian; Syrian; Tunisian; Yemeni; Bahraini; Emirati; Omani; Qatari; Iranian; Kurdish; Turkish; Assyrian. The category Indian included people reporting their ancestry as Anglo-Indian; Bengali; Burgher; Gujarati; Indian; Malayali; Nepalese; Pakistani; Punjabi; Sikh; Sinhalese; Maldivian; Bangladeshi; Bhutanese; Fijian Indian; Kashmiri; Parsi; Sindhi; Sri Lankan; Sri Lankan Tamil; Indian Tamil; Telugu. The Anglo category included people reporting their ancestry as Australian (not Indigenous); New Zealander; British; English; Scottish; Welsh; Channel Islander; Manx; Irish; American; Canadian. [↑](#endnote-ref-14)
15. We acknowledge that these usage statistics are ambiguous indicators of the availability of transit, inasmuch as they also will be influenced by auto ownership rates among residents. [↑](#endnote-ref-15)
16. Because percent Anglo residents was highly (negatively) correlated with percent recent immigrants, we exclude percent Anglo from the analysis in order to limit multicollinearity. [↑](#endnote-ref-16)