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Racial Discrimination and White First Name Adoption: Evidence from a Correspondence Study in the Australian Labour Market

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ABSTRACT

Racial Discrimination and White First Name Adoption: Evidence from a Correspondence Study in the Australian Labour Market*

We design and implement a correspondence study where we sent fictitious résumés with Chinese names and White names in response to both high-skilled and low-skilled job advertisements. Consistent with similar research elsewhere, we find that there is a large gap in getting interview offers when résumés with first and last Chinese names are used compared to résumés with White first and last names. To tease apart whether the gaps can be better explained by statistical or taste-based discrimination, we also sent out résumés of ‘Adopters’ with a Chinese last name but White first name. The benefit of having an adopter name was economically meaningful, reducing the gap by about the same amount as would occur if the applicant with a Chinese first and last name had instead received an additional year of honours education. To examine the extent and nature of discrimination, we collected two data sets with administrative population statistics. The administrative information shows that Adopter names signal different characteristics, including educational outcomes and parent background which is consistent with statistical discrimination. In addition, the pool of Chinese applicants is a mixture of international and domestic applicants with the domestic pool being higher achievers whereas the international applicants are much lower achievers. This mixture might be disadvantaging the domestic pool and providing an economic motive for becoming an Adopter. We discuss how our results may help formulate policies for parental investments and employers’ education to reduce employment and wage gaps observed between minorities and majorities in labour markets.

JEL Classification: J15, J71, J64, C93

Keywords: racial discrimination, correspondence study, labour market, administrative records

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1. Introduction

Labour market discrimination has been a key concern of both policy makers and economists alike (e.g., Neal and Johnson 1996; Altonji and Blank 1999; Lang and Lehmann 2012; Neumark, Burn and Button 2019). In this paper we examine the extent and nature of discrimination faced by minority workers in the Australian labour market and identify important plausible causes that may lead employers to discriminate against minority workers. We first conducted a large-scale correspondence study where we sent résumés with Chinese names and with White names in response to online job advertisements. Like other correspondence studies (Bertrand and Mullainathan 2004; Booth, Leigh, and Varganova 2012), we find robust evidence of discrimination against minority applicants in terms of getting interview offers.¹ And like other correspondence studies, there are potentially multiple reasons for this, including both taste-based and statistical discrimination.

Taste and statistical theories of discrimination (Becker 1957; Phelps 1972; Arrow 1973; Aigner and Cain 1977) assume vastly different behavioural motivations that ultimately lead to racial disparities in outcomes, identifying the underlying theoretical causes of discrimination in labour markets is important from an academic and policy perspective. For instance, the appropriate policy solution that addresses prejudicial employers will be vastly different to firms who are responding rationally to imperfect information. However, while several attempts have been made to uncover discrimination against minority workers, the existing literature has been less successful in uncovering the nature of discrimination (Bertrand and Duflo 2016).

As a first step to examine the potential nature of discrimination, we also examine Chinese applicants who ‘adopt’ White first names in our correspondence study (hereafter, ‘adopters’). While adopters might signal many differences with their non-adopter Chinese counterparts (e.g., integration into the majority culture and language skills), adopters and Chinese applicants

¹ See Bertrand and Duflo (2016) for a recent review of correspondence and audit studies.

nonetheless share the same skin colour, and as such could still receive animus-based discrimination compared to White applicants. Second, we look at two labour markets: high- and low-skilled with distinct skill requirements. Again, if discrimination is animus-based, adoption of White names would be treated similarly in both markets. Thirdly, we examine the correlates of White name adoption by Chinese parents by analysing birth record data, and we examine if names are a good predictor of academic achievements of job market candidates by analysing students' academic record data. Finally, we conducted an employer survey to find out what inferences, if any, employers make when they view CVs with Chinese and Adopters' names in contrast to White names.

Our paper is a novel approach where we examine two labour markets with distinct characteristics of candidate pools, and we let minority candidate signal to employers their 'assimilation' to the majority ethnic group through name adoption. The adoption of White first names is a common practice among Chinese and other racial minorities in the USA and Australia (Kang 1971), which has, however, often been ignored in correspondence studies.^{2,3} Minority candidates often adopt majority names by which they can signal their desire to assimilate with the majority group in response to expected discrimination. An individual's name is a vehicle to signal group identification and is a common way of displaying a cultural investment to the broader community (Broom, Beem, and Harris, 1955; Gerhards and Hans, 2009, Lieberson 2000). However, if discrimination is animus-based, such adoption may not improve outcomes for the minority candidates.

Additionally, in order to differentiate between discrimination in skilled and un-skilled labour market, we sent skill appropriate fictitious résumés to both high-skilled and low-skilled

² Oreopoulos (2011) is an exception where he used a combination of white first names and Chinese last names, among other résumé characteristics. However, his focus is primarily on why natives perform better than recent immigrants in the Canadian labor market.

³ Biavski, Giulietti and Siddique (2017) document that in the USA by 1930 one-third of naturalizing immigrants abandoned their first names to acquire names that were more frequent among US-born population.

job advertisements. Correspondence studies are typically conducted in low-skilled markets (see, for example, Bertrand and Mullainathan 2004, Booth et al. 2012, Neumark, Burn and Button 2019). In contrast, our use of two different markets taken from the same broader labour market can shed further light on the nature of discrimination involved. If discrimination is animus-based, minority applicants would be discriminated against in both markets, and the adopters' résumés would be treated in the same way irrespective of markets. However, if discrimination is statistical, the adoption of White names would reduce discrimination in the unskilled market more than in the skilled market. This follows since hiring in the skilled market depends on multiple skills beyond assimilation, so mere adoption of White names may not be an effective signal to employers who may lack important additional information on minority applicants' unobservable yet valued characteristics.

We select Chinese minorities instead of other racial minorities in Australia due to their significant presence in the local labour market, their distinctly identifiable names, and their widespread adoption of White names. In addition, Chinese workers in Australia have parental background and human capital that are similar to White workers. Based on nationally representative HILDA data,⁴ beginning with parental background in panel A in Table 1, the parents of Chinese individuals have completed slightly fewer years of schooling than the parents of White individuals, on average. However, Chinese households spend twice as much on a child's education relative to White families, and compared to children of White parents, children of Chinese parents are significantly more likely to attend university. Table A1 in

⁴ The HILDA stands for the Household, Income, and Labour Dynamics in Australia (HILDA) panel survey. The HILDA dataset collects a range of information on an individual's background, racial ancestry, and labour market outcomes. The survey began in 2001, and includes approximately 25,000 individuals and 9,800 households. For more information about the HILDA survey, please see the following website: <http://www.melbourneinstitute.com/hilda>.

Appendix 1 provides a detailed comparison of schooling and educational attainment between Chinese and Whites that is consistent with the above facts.⁵

[Table 1]

However, despite being a relatively high-achieving minority group, there are large disparities in raw earnings and employment between Chinese and Whites in Australia. (panel B in Table 1). There is a large Chinese-White wage gap of 7.7 percent for those who possess a University qualification (the gap is statistically significant at the one percent level). Similarly, panel B indicates that Chinese people with university qualifications are significantly less likely to be employed. These facts are striking given that the Chinese are overrepresented amongst University graduates.⁶ In the Business sector, the Chinese-White wage gap is 15.6 percent and highly statistically significant. In addition, the wage gap in administration jobs is 9.1 percent, and is statistically significant as well.⁷

The differences in labour market outcomes between White majorities and non-White minorities are documented in Australia and other similarly rich Western countries such as the USA. Recent studies have demonstrated the disadvantage that distinctive racial-sounding names incur for minority workers in the labour market (Arceo-Gomez and Campos-Vazquez,

⁵ Overall, the Chinese spend more years on average in formal education than Whites. Whites are substantially more likely to drop out of high school, with 37.6 percent of Whites failing to complete high school, compared to 11.6 percent of Chinese. Beyond high school, Chinese are also substantially more likely than Whites to remain in schooling and go on to obtain a University qualification at both the undergraduate and postgraduate levels. Nearly half of the Chinese hold a university degree, compared to 18.9 percent of Whites. Regarding English language proficiency, Chinese students outperform their White peers in the High School Certificate (HSC) English examination in New South Wales (NSW). The HSC is the round of exams final year high school students must sit in order to successfully graduate from High School in NSW. See: <http://www.smh.com.au/national/education/asian-students-more-likely-to-be-in-hsc-honours-list-20141213-126o4w.html>.

⁶ Research on wage gaps in the Australian labour market concentrates on earnings differentials between migrants and non-migrants. Booth et al. (2012) report large and significant employment and wage gaps for Indigenous, Italian, Chinese and Middle Eastern individuals. However, the gaps disappear once labour market experience, education and English language proficiency are added to the regression specification. In contrast, Breunig, Hasan, and Salehin (2013) report a wage gap for immigrants from non-English speaking backgrounds, once they control for unobserved heterogeneity.

⁷ Table A2 in the appendix presents additional results detailing the evolution of Chinese and White labour market outcomes between 2001 and 2011. Overall, the pattern of results indicates that the Chinese-White wage gap for University degree holders is increasing with time, but the wage gap is relatively stable for high school graduates. Furthermore, Chinese are also less likely to be employed over the same period.

2014; Bertrand and Mullainathan, 2004; Booth, Leigh, and Varganova, 2012;⁸ Carlsson and Rooth, 2007; Kaas and Manger, 2012; Oreopoulos, 2011; Pager, 2007; Pager, Western, and Bonikowski, 2009; Riach and Rich, 1991).⁹ In the context of the labour market, the decision by a minority job applicant to adopt a White first name can be interpreted as a signal of group identification with Whites rather than one's own racial group.¹⁰ In extreme cases, minority workers sometimes adopt majority's last names.¹¹

We study how firms treat minority workers of identical skill when a randomised proportion of those workers explicitly signal an affiliation with the White majority, under conditions where the firm continues to believe that the worker is from a racial minority group. Thus far, the predominant focus is measuring the disparity in outcomes between equally skilled, but distinct racial groups, as signalled by a racially suggestive name.¹² We add to the current literature by measuring the impact of adopting a White first name on the probability of obtaining an interview offer for a Chinese job applicant, without altering the recruiter's

⁸ Booth, Leigh and Varganova (2012) document the magnitude of racial discrimination faced by minority workers of five ethnic groups including Chinese and White (Anglo-Saxon) in the Australian labour market. However, Booth et al. focus only on low-skilled jobs (occupations included in their study were waitstaff, data entry, customer service and sales, in which the average hourly wages varied between \$18.5 to \$21.6 in contrast to non-managerial wage of \$26 per hour at that time), and similar to many other correspondence studies, do not take into account how minority candidates may adopt their job search strategies by adopting majority names to improve their prospects in the job market. They also do not explain the nature of discrimination or how discrimination may vary depending on candidate quality or across different skill levels.

⁹ For a review of the literature on the impact of names on labour market outcomes, see Charles and Guryan (2011), Guryan and Charles (2013), and Riach and Rich (2002). See Bertrand and Duflo (2016) for a recent review of correspondence (and audit) studies.

¹⁰ Fryer and Levitt (2004) find a growing propensity for Black parents in the USA to choose first names that are distinct from White names. The authors argue that the choice of a distinctively ethnic-sounding name is consistent with models of group identification (Akerlof and Kranton, 2000; Battu, Mwale, and Zenou, 2007), whereby Black types choose unique Black names and White types choose characteristically White names. Consequently, the use of either a first name associated with their racial ancestry or to adopt a visibly White name acts as a cultural identifier.

¹¹ Arai and Thoursie (2009) focus on the change in income of racial minorities who decide to adopt a localized Swedish-sounding last name in the Swedish labour market. Compared to minorities who retain their original, racially suggestive last name, those who localised their last names experienced a substantial increase in their income. The authors interpret these results as evidence of discrimination based on the person's perceived race, as indicated by their last name. A person's last name is typically hereditary and patrilineal. Consequently, the effect of replacing a minority last name with a majority last name alters the labour market's belief of the racial ancestry of the worker. For instance, those who replace their ethnic last name with a White last name will be perceived by firms to be a member of the White group. Conversely, retaining a distinctive ethnic name can be regarded as a rejection of the majority culture.

¹² Biavnschi, Giulietti and Siddique (2017) is an exception; using historical records of immigrants from 1930s, they document large labour market returns when low-skilled workers in the US adopt local names.

perception of the race of the job applicant. In response to real world job advertisements in the Australian labour market, the first name that appears on a Chinese job applicant's résumé is randomly varied between either a typically White or Chinese first name.

When manipulating first names, it is important for the purposes of this study that recruiters continue to perceive the job applicant they are screening as a person of Chinese ancestry, even though the applicant may have a White first name. To signal that the applicant is Chinese, the applicant's résumé explicitly retains the Chinese last name. According to traditional naming practices, Chinese children inherit their last name from their parents, which guarantees that Chinese job applicants with a White first name will be perceived by recruiters as being of Chinese ancestry.¹³

We find substantial discrimination in interview offers against Chinese job seekers who retain their Chinese first names in the Australian labour market. There is a highly statistically significant racial gap with applicants with White names having a 12 percent chance of receiving an interview offer, compared with a 4.3 percent chance for those with a Chinese first name. In addition, we uncover evidence that there are substantial benefits for Chinese 'Adopters'. The Adopters have an 8.2 percent chance of being offered an interview opportunity. Thus, switching from a Chinese to a White first name effectively doubles the probability of receiving an interview offer for a Chinese job applicant. Additional results reveal that the return to using a White first name differs dramatically by the skill level of the job. While in the high-skilled jobs, a large and significant racial gap between White and Chinese names, and White and 'Adopters' persist, in the low-skilled jobs, the Adopters' résumés are just as likely as White names to receive an interview offer. The attenuation in the White-Adopter racial gap cannot be attributed to a lower overall level of racial discrimination in the low-skilled employment sector,

¹³ A potential shortcoming is that 'adopters' of White first names could be regarded as mixed race, an issue that we recognize as a potential limitation and discuss the implications of in Section 5.

as a large and significant racial gap between White and Chinese names remains in low-skilled jobs.

Finally, to ensure that our results are not driven by the variance of unobserved productivity differences between White and Chinese applicants – an important observation about correspondence and audit studies made by Heckman and Siegelman (1993) -we apply a method proposed by Neumark (2012).¹⁴ We find that our findings remain robust, and they are not driven by the differences in unobserved variances between the two racial groups.

Given the aforementioned findings, we collect additional data to better understand the plausible mechanisms behind the results. We collect academic achievements of Whites, Chinese and Adopters at various levels of education by looking at the administrative records collected by a large Australian university. The collected data contains parental background information that can be linked to the name adoption decision and to the academic achievements of students. We also look at the parental background of the relevant cohorts of our fictitious job applicants by looking at birth records collected from the most populous state of Australia – the New South Wales (NSW) Birth Registry. We find that Chinese applicants with White first names indeed signal different characteristics, and White name adoption by Chinese parents might be systematically linked to parental background.

Overall, our results suggest that the nature of discrimination against Chinese job seekers is consistent with statistical discrimination. First, we find that the Adoption of White first names by Chinese applicants attenuates employers' discrimination more in the low than high Skill labour markets. Second, we find that adopting a White first name credibly signals distinct Parental background characteristics and higher academic performance.

¹⁴ Heckman and Siegelman (1993)'s and Heckman's (1998) criticism of correspondence and audit studies rests on the fact that variance of the unobserved productivity may differ across racial groups. If so, correspondence (and audit) studies can generate spurious evidence. To address this, Neumark (2012) develops a statistical estimation procedure that allows us to identify the effects of discrimination in such studies. However, the method requires the correspondence study design to have variation in applicant characteristics that affect hiring. Our design includes both Honours and non-Honours applicants which allows us to implement Neumark's method.

The rest of the paper is organised as follows: in Section 2 we provide an overview of the experimental design; in Section 3, we discuss the results from our correspondence study; in Section 4, we further explore the plausible nature of discrimination in the Australian labour markets with the use of additional administrative and survey information collected post our correspondence experiment; and we provide our conclusions in Section 5.

2. Experimental Design

2.1 Labour markets and applying for jobs

We submitted 4,702 fictitious résumés in response to 1,334 entry level graduate and administrative online job announcements. We refer to the graduate and administrative positions henceforth as high- and low-skilled jobs, respectively, due to their education requirements. Typically, graduate jobs require an undergraduate degree whereas administrative jobs do not specify tertiary education requirements.¹⁵

Our fictitious job seekers were 22-23 years old with minimal labour market experience.¹⁶ We excluded job postings that required applicants having two or more years of labour market experience. We did this for several reasons, but primarily to reduce heterogeneity in both the positions being sought and the consequential need for greater heterogeneity in the résumés that could introduce additional noise in our estimation of discrimination.¹⁷

The job advertisements were posted on the websites www.seek.com.au, the largest online job board in Australia, and www.mycareer.com.au. We used online job advertisements since

¹⁵ According to the Australian Bureau of Statistics (ABS) Labour Force survey (2013), about 47 percent of workers in the business labour market possess a bachelor degree or higher, and 58 percent possess bachelor degree or higher in engineering, whereas 46 percent of administration workers do not hold a post-high school qualification.

¹⁶ Although neither the résumés nor cover letters explicitly state the age of the job applicant, the résumé states the year of completing high school, implying an age of 22 or 23.

¹⁷ Differences in human capital between racial groups that accrue after entering the labour market may potentially reflect bias from recruiters who may actively select workers of certain racial backgrounds to receive extra training, or reflect endogenous worker choices. Consequently, we responded exclusively to entry level positions for both graduate and administration assistant jobs when searching for online vacancies.

they are one of the most common recruitment tools used by Australian recruiters. We used two different sites in order to respond to as many job advertisements as possible during the study period. Nearly 70 percent of graduate recruiters in Australia report recruiting using online websites (Carless, 2007). Similarly, websites were the second most favoured recruitment tool of graduate recruiters.¹⁸ We restricted the jobs we sent résumés to be in Sydney and Melbourne since these two cities represent 40 percent of total employment in Australia, and since this again reduces variation across the résumés (such as address and high school and university attended).¹⁹

We responded to almost all qualified (e.g., entry level graduate jobs asking for graduates in commerce, marketing, etc.) job ads over a seven-month period from March to October 2013. Our design was to send six résumés to each job advertisement in a random order. The six résumés differed by gender (male, female) and ethnicity (Chinese first and last name, White first and last name, and White first and Chinese last name) of the applicant. The six gender by ethnicity résumés were sent to each employer in a randomized sequence. Within the sampling period, the same ad was occasionally reposted by a recruiter. In these cases, résumés were only sent to the initial posting, and never to any subsequent postings for that job. In addition, some advertisements were taken down by the employer or expired before all six résumés were sent, thus occasionally, not all employers received all six treatment types. Table A3 in Appendix 1 summarizes all the job types in the experiment.

2.2 Identity of the job applicants

To successfully convey the race of the applicants to recruiters, the names used in the experiment were chosen based on their popularity. Appendix Table A4 shows the full range of White and

¹⁸ The recruiters chose from eight recruitment options. For more information on the graduate recruiter survey, see: <http://www.graduatecareers.com.au/research/surveys/graduateoutlooksurvey/>.

¹⁹ Bertrand and Mullainathan (2004) also restricted sending résumés for jobs in two US cities: Boston and Chicago. However, unlike Boston and Chicago, Melbourne and Sydney constitute the most significant proportion of the skilled labor force in Australia.

Chinese first and last names used in the experiment. Both male and female names are included. The White first names are selected from the most popular baby names in the New South Wales and Victorian state government birth registries, the states where Sydney and Melbourne respectively reside.²⁰ The selection of first names was restricted to the decade of the 1990-2000 to match the age of the fictitious job applicants. White last names are taken from the 2007 Australian government list of most common last names in the nation. The Chinese first names used in the experiment are randomly selected from the website ‘Top 100 Baby Names’, and Chinese last names are based on household data collected by the Chinese Ministry of Public Security in 2007.²¹

To create a full name for the job applicants, a first name is randomly combined with a last name. We created three first and last name pairings: ‘White’ with first and last White names; Chinese with first and last Chinese names; and ‘Adopters’ with a Chinese last name with an ‘adopted’ White first name. The first names of the White and Adopter applicants are identical (Table A4) while the last names of the Chinese and Adopters are identical (Table A4). Using the same Chinese last names for both the Chinese and Adopter applicants indicates Chinese racial ancestry, and thus minimises any potential recruiter misperception that the Adopters belong to a different racial group. Confusion is highly unlikely given the common practice that children inherit their last name from one’s parents in both White and Chinese families.²²

²⁰ The New South Wales popular baby names website is available at: <http://www.nsw.gov.au/about-nsw/popular-baby-names> and the Victorian website is available at: <https://online.justice.vic.gov.au/bdm/popular-names>.

²¹ It is possible that the gender of a Chinese job applicant is potentially ambiguous to a recruiter when read from a résumé. Although the central focus of this paper is racial discrimination rather than gender discrimination, recruiters are nonetheless provided with subtle gender cues in the job application, by the use of gendered titles such as ‘Mr’ or ‘Ms’.

²² Traditional Chinese naming practices closely mirror White naming conventions. Chinese names are composed of the combination of a first (given) name(s) and an inherited last name. Importantly, a Chinese person’s last name is inherited from one’s parents, which mirrors traditional White naming conventions. This guarantees that the last name on an ‘Adopters’ résumé conveys the race of the job applicant. In contrast with White naming conventions, however, Chinese names are traditionally ordered with the last name preceding the first name. However, in English speaking societies, it is common practice for the Chinese to revert the ordering of their name to follow White naming practices, with the first name preceding the last name.

2.3 Education, job history, and other résumé characteristics

In the Australian labour market, recruiters commonly request a résumé and a cover letter from job applicants. We thus created a prototype résumé and cover letter for the ‘high-skilled’ graduate jobs and another for the ‘low-skilled’ administration jobs. We based the résumés on actual current job seekers for the high and low skill positions. For each of the six résumés and cover letters sent to each job posting, six names (Gender (male, female) by race (Chinese, White and Adopter)) were then randomly assigned to each résumé.

In the high-skilled jobs, both honours non-honours graduate résumés were sent to recruiters. We varied the educational quality primarily for three main reasons. Firstly, it allowed us to determine whether the level of discrimination is affected by the educational quality of applicants. Given that we sent résumés for both high and low-skilled jobs, this allows us to examine discrimination at low skill; high skill but low educational quality; and high skill and high educational quality. Secondly, by varying the educational quality, we could obtain a comparison of the magnitude of discrimination, and impact of being an adopter. Thirdly, the variation in educational quality in the high-skilled market allows us to address Heckman and Siegelman (1993)’s criticism of correspondence studies (see footnote 16).

In the low-skilled jobs, each administration position resume was assigned with a high school education. Similar to Deming et al. (2014) and Kroft et al. (2013), each résumé across both job types explicitly states the year of graduation from high school and university (for graduates) to ensure that there are no gaps in the applicants’ level of work experience. Furthermore all résumés (including both the ‘Adopters’ and Chinese job applicants) stated that high school and university (for graduate applicants) were completed in Australia and employment history was confined to Australia. Additionally, all voicemail messages were recorded by native speakers with Australian accents. Appendix Table A5 presents the summary statistics and randomization balance check.

2.4 Outcomes measured

In total, 4,702 résumés were sent in response to 1,334 job advertisements. When measuring outcomes, we record two responses: (1) receiving an interview offer (IO), and (2) receiving a ‘callback’ (CB), which is defined as receiving either a ‘yes’ or ‘no’ response from the recruiter either by email or telephone.²³ We define a third outcome, which is receiving an interview offer, conditional on receiving a callback (IOCB). If a recruiter did not respond to a job applicant at all, the absence of any response is coded as a rejection of the application. Responses are collected from both the voicemail messages and emails sent by recruiters and are matched with the recruiter’s name and firm information recorded. However, in 41 cases, responses were received whereby a recruiter invited a job applicant to proceed to the next round of the screening process, rather than providing an explicit interview offer. These responses were coded under IO as they represented a successful job application.

2.3 Collecting recruiter information

We also collected data on recruiter characteristics when available. We matched the recruiter’s name listed in the job ad, phone or email responses with the information listed in the matching user profile from the www.linkedin.com website.²⁴ To ensure that recruiters are accurately matched with the correct LinkedIn profile, the name of the firm listed in the recruiter’s work history were matched with data records. Recruiters whose name could not be uniquely matched with a LinkedIn profile are not included in the study sample. The race, gender, and years of work history of a recruiter are recorded. A recruiter’s race is subjectively determined using a combination of the recruiter’s last name and the photo supplied in the LinkedIn profile. When

²³ If recruiters contacted us for other reasons (e.g. to ask for additional information), we coded it as a callback.

²⁴ LinkedIn is a large professional networking website where individuals create user profiles that contain a rich array of information detailing their education, years of work experience, professional history and other relevant qualifications. The LinkedIn website is well-subscribed to in Australia, with 6 million registered members at the time of our correspondence experiment.

a photo was not available, we resorted to social networking websites to obtain a photo or, in some cases, relied solely on the last name of the recruiter.

Recruiter's race or gender could be an important determinants of in-group bias implying that ethnic majority (minority) recruiters may favour job applicants of their own ethnicity. Similarly, recruiter's experience may matter though it is not clear in which direction it may matter.²⁵ For example, if a more experienced recruiter would be more prejudiced or less prejudiced is not obvious, and hence remains an empirical question.

3. Results

Table 2 summarizes the distribution of recruiter responses for the interview offers and callbacks. Approximately 77 percent of recruiters did not offer an interview to any of our job applicants, regardless of the candidate's race, and approximately 62 percent of the recruiters did not call back any of our candidates, regardless of the candidate's race. About 23 percent of firms sampled invited at least one job applicant to an interview, and 1.3 percent of firms offered every job applicant an interview. In terms of the distribution of interview offers by race, 4 percent of recruiters exclusively invite White job applicants to an interview. In comparison, 1.4 percent of recruiters exclusively invite Chinese job applicants to an interview, while 2.8 percent of recruiters invite only the Adopters to an interview.

[Table 2]

To summarize, the majority of recruiters do not contact any of the job applicants, and a minority choose to contact all of the job applicants. Of the three name types, recruiters are more likely to exclusively contact Whites, followed by the Adopters, and then the Chinese job applicants.

3.1 Racial gaps in outcomes and the impact of the White first name adoption

²⁵ For example, List (2004) finds that higher experience (of dealers in sports cards market) is positively associated with higher discrimination against minority (buyers).

Table 3 summarises the outcomes of our experiment – interview offer (IO), callback (CB), and interview offer conditional on callback (IOCB) by race of the applicants, by high-skilled and low-skilled jobs, by gender, by sectors and finally by cities. The first three columns provide the mean value of the outcome by applicants’ race, while the last three columns provide the differences in mean values between White applicants and Chinese applicants, between White applicants and Adopters, and between Chinese applicants and Adopters, respectively.

Beginning with the full sample in row 1, while a White job applicant has a 12.0 percent chance of being offered an interview by a recruiter, a job applicant with a Chinese name only has a 4.3 percent chance of receiving an interview offer. This racial gap in interview offer is large -7.7 percentage points and an almost 200% relative increase for a White applicant, and this gap is statistically significant. Whilst recruiters discriminate against those who retain a Chinese first name, the use of a White first name by a Chinese job applicant is rewarded in the labour market. Compared to Chinese first names, the Adopters are 3.9 percentage points more likely to receive an interview offer, which is an almost 100% improvement that is highly statistically significant.

Thus, a simple comparison reveals that using a White first name approximately doubles the probability of being awarded an interview offer for Chinese job seekers, despite both the Chinese and Adopter job applicants having a Chinese last name and identical qualifications. The reduction in the racial gap for Adopters is highly statistically significant and is entirely attributable to the manipulation of a Chinese job applicant’s first name. However, the racial gap does not completely attenuate. The difference between White names and Adopters is 3.8 percentage points and is statistically significant at the 1 percent level.

The above findings – significant racial gap between White and Chinese résumés, and a reduction in the gap for Chinese résumés with White first names remain consistent across the

other two outcomes - callback received from recruiters, and interview offer conditional on callback received from recruiters.

[Table 3]

The remainder of Table 3 compares the IOs, CBs, IOCBs broken down by skill, gender, sector and city. The large disparities in outcomes between White applicants and Chinese applicants remain consistent across all those dissections. White names are most favoured by recruiters, and a large and statistically significant racial gap is observed between résumés with White and Chinese names. Adopters are much more likely to receive an interview offer (and call back) compared to applicants who use Chinese first names. In fact, in the low-skilled jobs, recruiters treat White and Adopters résumés almost equally as there is no statistically significant differences in IOs (and other outcomes) between White and Adopter résumés.

Figure 1 provides a graphical representation of the average interview offer rates across White and Chinese names, and the Adopters. The large disparity in interview offers between White and Chinese names in the full sample (all jobs combined), high-skilled jobs, and low-skilled jobs is starkly illustrated in Figure 1. The dramatic improvement in the probability of receiving an interview offer for Adopters can also be seen vividly. The figure also compares the average interview offer rate for high-skilled jobs. While the average interview offer rate for Adopters is higher than Chinese résumés, the difference between Adopter resumes and White resumes remain statistically significant. In contrast, it is evident from the figure that in low-skilled jobs, the likelihood of receiving an interview offer between White and Adopter résumés is almost identical, while Chinese résumés receive significantly fewer interview offers.

[Figure 1]

We extend the analysis by estimating the following logit regression model:

$$\Pr(y = 1|\mathbf{x}) = \beta_0 + \beta_1 \text{Chinese Name}_i + \beta_2 \text{Adopter Name}_i + \beta_3 X_i + \varepsilon_i \quad (1)$$

where y is an indicator variable equal to one if the individual receives an interview offer (or callback); $Chinese\ Name_i$ and $Adopter\ Name_i$ are indicator variables for Chinese names and Adopters, respectively; and X_i is a vector of controls that include gender of the applicant, firm's/recruiter's location (Sydney or Melbourne), skill type, and sector. In each specification, White names are the base case, and the standard errors are clustered at the firm-level. We are primarily interested in β_1 and β_2 which capture, *ceteris paribus*, the difference in outcomes between Chinese and White names, Adopter and White names, respectively; and the difference between β_1 and β_2 which captures, *ceteris paribus*, the difference between Chinese and Adopter names.

[Table 4]

Table 4 reports the marginal effects from the logit regression for the combined sample of high- and low-skilled jobs.²⁶ Beginning with the raw differences in interview offers in column 1, there is a large Chinese-White racial gap of 7.7 percentage points, which is highly statistically significant. However, the racial gap reduces by half to 3.8 percentage points for the Chinese job applicants when they change their first names to White names. The p -value comparing the mean Adopter and Chinese outcomes is zero, indicating that the reduction in the racial gap due to using a White first name is statistically significant. However, the racial gap against Adopters does not completely attenuate; a statistically significant racial gap (3.8 percentage points) persists between Adopters and White names. The large racial gap in interview offers between White and Chinese résumés and a reduction in the racial gap due to using a White name in the résumé remain robust when we add controls for job types (skilled or unskilled), applicant's gender, recruiter's city, and recruiters' sector (column 2), or examine other job market outcomes (columns 3 and 4).

²⁶ We repeat the logit regressions in linear probability model (LPM)s. Overall, the conclusions drawn from the LPM results do not differ from the marginal effect estimates produced by the logit regressions. LPMs results are available from authors on request.

In column 2, we find that in comparison to the low-skilled market, the likelihood of an interview offer is 7.4 percentage points higher in the high-skilled market, which reflects the tighter market conditions in the higher-skilled market. Female job applicants are favoured in the labour market, and the marginal effect is a 2.0 percentage point increase in interview offers (columns 2 and 5). Similarly, interview offers are 2.1 percentage points higher in Sydney than in Melbourne. However, there is no statistically significant difference between business and non-business sectors.

In column 3, we replace the outcome variable with the callback rate. The results indicate that, aggregated across high- and low-skilled markets, recruiters are much less willing to contact a job applicant with a Chinese name. Whilst the callback outcome measure includes interview offers, it also measures the propensity of recruiters to notify the applicant of a rejection. Thus, recruiters award fewer interview offers to Chinese résumés and are also less likely to notify the worker of an unsuccessful outcome of their job application. Once again, the use of a White first name considerably reduces the racial disparity in callback.

In column 4, we examine receiving an interview offer among the job applicants who receive a callback. Conditioning on receiving a call back dramatically increases the magnitude of the racial gap in interview offers for both Chinese and Adopter résumés, and importantly, the direction of the marginal effects is consistent with previous columns. In addition, the difference in the probability of receiving an interview offer between Chinese names and Adopters substantially increases. Among the job applicants who receive a callback, Chinese job applicants are 24.0 percentage points less likely to receive an interview offer, whereas Adopters are 10.9 percentage points less likely. Consequently, among the job applicants contacted by a recruiter, Adopters are more than twice as likely to receive an interview offer compared to those with Chinese first names.

In the last column of Table 4, we focus on the interaction between applicant's race and market types. The likelihood of receiving an interview offer is 7.1 percentage points higher in the high-skilled market than in the low-skilled market, with both Chinese (6.8%) and Adopter (10.9%) résumés receiving more interview offers in the high-skilled market.

Figure 2 shows the interview offers received in high- and low-skilled jobs by our fictitious applicants organized by the race of the applicants. Outcomes in the two markets are significantly different from each other irrespective of the race of the applicants. However, in both markets, Chinese applicants with White first names receive a far more favourable responses compared to Chinese applicants who retain their Chinese first names and the differences are statistically significant.

[Figure 2]

3.2 Racial gaps in high-skilled and low-skilled markets

To examine if White résumés, Chinese résumés, and Chinese résumés with White first names are treated differently by recruiters in the high- and low-skilled markets, we spilt the sample into high and low-skilled jobs. Why might discrimination vary by skill-type? One possibility is that recruiters may have less experience in dealing with minority workers in one market than the other market. For example, .g., recruiters might have dealt with minority workers more in the low-skilled market than in the high-skilled market due to higher base rate of all workers in the low skill market, including more minority workers,. Alternatively, variance in productivity among minority workers might be higher in one market (typically in the high-skilled market), prompting a risk-averse recruiter to play it safe and offer fewer jobs to minority workers.

In Table 5, Panel A and Panel B show the logit marginal effects for high- and low-skilled jobs, respectively. Beginning with high-skilled jobs in Table 5, there is a substantial racial gap in all three outcomes. In interview offers, the gap is approximately 10.1 percentage points for Chinese graduates. This implies while White job applicants get one interview for every 6.25

job applications, to get the same interview, the Chinese job applicants need to send 16.67 job applications, which is 2.67 times (or 167%) more than White applicants. The adoption of White first name by Chinese applicants reduces the racial gap between White and Chinese résumés to 6.3 percentage points, which is a substantial improvement of 3.8 percentage points. Importantly, the adoption of White first names by Chinese applicants make them statistically different from Chinese applicants who retain their Chinese first names. Note that despite the improvement, the racial gap in interview offer between Adopters résumés and White résumés persists in the high-skilled job market.

[Table 5]

Panel B in Table 5 provides the estimates for the low-skilled jobs. For all three outcomes, there is a large and statistically significant racial gap between White job applicants and Chinese job applicants. As an illustration, in contrast to approximately 15 applications for a White job applicant, a Chinese job applicant needs to send approximately 53 applications to get one interview offer, which is 3.6 times (260%) more than White applicants! This also implies that the relative size of the discrimination is larger in the low-skilled job market than in high-skilled job market, which may reflect the overall supply-demand situation of the two markets in which firms have more choice in who they can interview, and hence greater ability to discriminate.

Critically, in the low-skilled labour market the statistically significant disparity between White names and Chinese applicants in all three outcomes considered here disappears when the latter group adopts White first names. Moreover, the small *p*-values indicate that the difference between Chinese and Adopter outcomes is highly statistically significant. Thus, while Chinese résumés receive significantly fewer interview offers than both White and Adopter applicants, there is no statistical evidence of a racial disparity in outcomes between Whites résumés and Chinese résumés with White first names in low-skilled jobs. The results

also show that female résumés receive more favourable treatment than male résumés in low-skilled jobs.

To summarise, breaking down the sample by skill type demonstrates that in high-skilled occupations, there is a large racial gap for Chinese job applicants who retain a Chinese first name, and the discrimination against Adopters, while smaller, still persists. In comparison, racial discrimination against Adopter job applicants is completely eliminated in low-skilled jobs; the Adopters are just as likely as applicants with White names to receive an interview offer and callback.

3.3 Returns to quality

We further distinguish among high-skilled job applicants by looking at the differences among graduate résumés with and without an Honours degree²⁷ interacted with the three résumé types – White, Chinese and Adopters. Column 5 in Table 5 (Panel A) shows the estimated coefficients for returns to an honours degree, and the marginal effects of Chinese applicants with honours and Adopters with honours. They are further plotted in Figure 3.

[Figure 3]

Unsurprisingly, there are substantial returns for graduates with an Honours degree. The interview offer for White applicants without honours is 13.3 percent, which increases to 19.8 for White applicants who graduated with an honours qualification (Figure 3). In contrast, the likelihood of receiving an interview offer for Chinese applicants without an honours qualification is approximately 4.5 percent, which increases to 8 percent for Chinese job applicants with an honours qualifications. However, returns to quality is higher for the Adopters; the likelihood of interview offers for Adopters increases from approximately 7

²⁷ In Australia, an honours degree requires an additional year of schooling. Moreover, an honours degree is very competitive in Australia, with on average less than 2% of graduating students being invited to participate in the honours programs, and completion of it requires a substantial amount of hard work for students. Hence, the quality signal of an honours degree is locally well-known and well-recognized by employers.

percent without honours to 13.5 percent with honours. In comparison, this indicates that the likelihood of interview offer in the high-skilled job market is identical for White applicants without an honours degree (13.3 percent) and Adopters with an honours degree (13.5 percent). Thus, adoption of a White first name combined with a higher quality résumé entirely attenuates the racial gap in high-skilled market.

The high returns to quality in résumés of minority candidates with honours is in stark contrast with Bertrand and Mullainathan (2004) (BM) who found that returns to quality in résumés with Black sounding names are negligible. The contrast with BM could be due to the difference in the quality signal. In BM, quality is signalled through marginally more labour market experience, ‘fewer holes’ in the employment history, containing an email address, among others. In contrast, an honours degree is a very strong quality signal as mentioned in the previous footnote (footnote 29). Thus, a clear signal of high-quality may be critical to improve minority success.

3.4 Robustness: Effects of Locations, Sectors, Firms Size and Recruiter Characteristics

We examine the robustness of our findings to differences in recruiters’ locations (Sydney or Melbourne), sectors (business or engineering²⁸), firm size (large if listed in the Australian Stock Exchange (ASX), and small otherwise), and recruiters’ characteristics. Note that the last set of covariates is limited to the availability of recruiters’ profile in LinkedIn as described in Section 2.5. Results are presented in the Appendix Table A6.

Similar to the aggregated data, in both Sydney (column 1) and Melbourne (column 2) labour markets, we observe a large racial gap in interview offers for Chinese names and a reduction in the gap with the adoption of White first names. These results confirm that our findings are not driven by the recruiters’ location. When we add an indicator for whether the

²⁸ See Appendix Table A3 – Occupation Categories for sectors classified as business or engineering.

recruiting firm is listed in the ASX as an indicator variable as a proxy for firm size, we find that the marginal effect of the recruiter size is not statistically significant (column 3), and it does not change the magnitude of the racial gap in interview offers estimated earlier. When we control for the gender, race, and experience of recruiters²⁹ (column 4), the racial gap in interview offers for job applicants with Chinese names increases substantially to 15 percent in high-skilled market and 16 percent in the low-skilled market. Once again, the Adopters are substantially more likely to receive an interview offer compared to those with Chinese first names, however, the difference is not statistically significant any more in either of the markets. However, these results of the effects of the recruiter characteristics should be interpreted with caution due to the observational nature of the data, and the substantially lower sample size compared to the overall data collected in our experimental set up.

3.5 Heckman and Siegelman's Criticism and Neumark's Solution

Finally, we address Heckman and Siegelman's (1993) and Heckman's (1998) criticism of correspondence (and audit) studies, which rests on the fact that variance of the unobserved productivity may differ across the racial groups. In our experiment and in almost all correspondence (and audit) studies, applicants from both racial groups – White and Chinese - were equal on observable characteristics (Z_1) by design. Employers received no information on the unobservable productivity related characteristics. However, employers may rank applicants based on the expected sum of observable and unobservable characteristics. Even though employers cannot observe unobserved productivity related characteristics of applicants (Z_2), as long as the variance of Z_2 is higher for Whites, the expected sum of Z_1 and Z_2 would be higher for White applicants, which is a rational outcome. If so, correspondence (and audit) studies can generate spurious evidence of discrimination.

To address this, Neumark (2012) develops a statistical estimation procedure that allows us

²⁹ List (2004) who recruited buyers and sellers at a sports cards market documented that experienced dealers discriminate minorities more.

to identify the effects of discrimination in such studies. However, the method requires the correspondence study design to have variation in applicant characteristics that affect hiring. Our design that includes job applicants with both honours and non-honours allows us to implement Neumark's method. Results are presented in Table A7 in Appendix 1.³⁰

In Table A7, the first row in Panel A shows the estimates from a basic probit model. Similar to results presented in Table 4 (column 2, rows 1 and 2 in Table 4) the Chinese and Adopter applicants received 7.4% and 3.2% fewer interview offers, respectively (columns 1 and 2 in Table A7), in comparison to White applicants,. Similar to results found in the high-skilled markets presented in Table 5 (column 2, rows 1 and 2 in Table 5), the Chinese and Adopter applicants received 10.5% and 6.5% fewer interview offers, respectively, when compared to White applicants. Hence probit results in Panel A of Table A7 are a mere repetition of logit results reported earlier (in Table 4 and Table 5).

The first row in Panel B in Table A7 reports the estimated overall marginal effects of race from a heteroskedastic probit model. They are very similar to estimates from simple probit (row 1 in Panel A). The next two rows show the decomposition of the marginal effects into the effect through level and the effect through variance. The effect through the level of the latent variable is larger than the marginal effect from the probit estimates. In contrast, the effect of race through the variance of the unobservables is positive, though statistically insignificant. These results thus indicate that our estimates of race discrimination reported in Table 4 are biased downward implying that the actual extent of discrimination is larger than what we report here.

³⁰ We are grateful to David Neumark for sharing the codes that helped us to replicate his estimation process in our data.

4. Interpreting the Results

Given the results described in the preceding section, we now examine the following two interrelated questions. First, how do we interpret the significantly lower rates of interview offers and callbacks for Chinese job applications in both low-skilled and high-skilled job markets compared to that of White job applicants? Secondly, how do we interpret the finding that there is less to no discrimination against Chinese job applicants with White first names in both high-skilled and low-skilled job markets? In answering these questions, we hope to disentangle to some extent the nature of discrimination. In particular, we focus on the nature of the signal that a Chinese name and an Adopter name could be potentially indicating to employers. To do this, we look at additional data sources that can tell us whether there are any statistical differences based on these names, as well as employer's beliefs on the quality and characteristics that each name might signal to them.

We look for answers from (1) students' administrative record data at a large Australian university, and (2) birth record data from the Australian state of New South Wales (NSW). In addition, we conducted an employer survey discussed briefly in sub-section 4.3. These additional data sets combined can help us to examine whether White job applicants and Chinese job applicants in Australian job markets differ in their parental background, English language ability, and if there is any systematic difference in academic achievements and parental background between Chinese job applicants who adopt White first names and those who retain their Chinese first names. With this information, we can examine whether the observed discrimination in the correspondence study is consistent with statistical discrimination.

4.1 Evidence from students' records

We obtained de-identified students' records from a large Australian university for the enrolment years 2008, 2010, and 2012, which are the relevant cohorts featured in our experiment. In the empirical analysis, we include all three enrolment years but keep students

born only between 1987 and 1993. Students enrolled in the relevant cohorts but born earlier or later were not included in our analysis.³¹

The data includes information on students' first and last names coded into 'White', Chinese, and 'others'. These codes allow us to categorize students into three groups - White, Chinese, Adopter (White first name and Chinese last name), and the rest to 'others'. In terms of students' attributes, the data also includes information on each student's gender and country of birth, whether the student is domestic or international, the student's Australian Tertiary Admission Rank (commonly known as ATAR) when relevant, and the type of secondary school in Australia where the student studied categorized into Catholic, private, public, and public-selective.³²

While the data contains information on the education level of some parents, most parents/students had not reported it, and thus we only have information on at least one parent's education for 58 percent of parents reported in one of five categories – bachelor degree, post school qualification, post-graduate, year 10 or equivalent, and year 12 or equivalent. Finally, the data also includes the language spoken at home, and parents' socio-economic status which is determined by the parents' permanent address and categorized by the University into high, medium and low. In terms of students' university education and outcomes, the data includes information on each student's course level (bachelor graduate entry, bachelor honours,

³¹ To be precise, the fictitious applicants used in our correspondence study were born between 1988 and 1992. In order to keep the sample size large, we kept students born in 1987 as well as in 1993. However, the empirical results remain unchanged if we drop students born in 1987 and 1993.

³² These are the four main providers of Australian primary and secondary education in all states and territories. We drop 0.6% students who studied in 'others' school not specified in the data. A student's ATAR rank is determined by a combination of their internal overall school rankings and state-wide high school completion examinations.

bachelor pass), field of education (organised into 10 categories),³³ and weighted average mark (WAM).³⁴

We first examine the link between students' ethnicity and students' academic outcomes in tertiary education. We extend the analysis to the outcomes in secondary education for a subset of students for whom we have comparable data. We estimate equations of the form:

$$Y_{it} = \alpha + \gamma N_i + X_i\beta + \lambda F_{ij} + \varepsilon_{it} \quad (2)$$

Where Y_{it} is the educational outcome of student i achieved in year t . Y_{it} is the WAM for the tertiary level outcome and the ATAR for the secondary level outcome. N indicates names categorized into White, Chinese and Adopter. X_i represents an array of i 's characteristics including birth year, parents' characteristics, and an indicator for domestic or international. We control for the Field of Education (FOE) j that student i studied, indicated as F_{ij} .

Second, in order to examine the relationship between parental characteristics, and names given to children, we estimate equations of the form:

$$N_{it} = \alpha + X_i\beta + \varepsilon_{it} \quad (3)$$

Where N_{it} is the first name of individual i born in year t , and X_i represents an array of i 's parents' current characteristics, some of which are time invariant. The standard errors are clustered by year.

[Table 6]

Column 1 in Table 6 shows results where we regress students' WAM on their names, controlling for their cohorts, course, and FOE. Students of Chinese ethnicity with Chinese first

³³ The ten categorizes are based on the Department of Education's broad fields of education. They are: Natural and Physical Sciences; Information Technology Engineering and Related Technologies; Architecture and Building; Agriculture, Environmental and Related Studies; Health; Education; Management and Commerce; Society and Culture; and Creative Arts.

³⁴ WAM is the average mark a student has achieved across all completed units in his/her courses. WAM is weighted according to the credit point value and academic level (such as junior or senior) of the units completed by a student. It does not appear on students' results notice or academic transcript. However, the WAM is the university's way of measuring academic performance of a student and is often used to determine students' eligibility for an honours program, prizes and scholarships, or for assessing progression in his/her degree.

and last names on an average achieve 3.72 points (5.65%) lower WAM compared to students with White first and last names. In contrast, Adopters - students of Chinese ethnicity with White first and Chinese last names achieve 1.93 points (2.93%) lower WAM compared to students with White first and last names. Between the two Chinese students' groups, Adopters do better, and the difference in WAMs between the Chinese students who retain their Chinese first names and Chinese students who adopt White first names are statistically significant.

However, this difference between White and Chinese, and within the two groups of Chinese students are driven entirely by the international students as shown in column 2. Chinese students are divided into four groups for the sake of comparison. Here, both groups of domestic Chinese students perform as well as White students. However, the groups of international Chinese students achieve a significantly lower WAM compared to White students, domestic Chinese students who retain their Chinese first name, and domestic Chinese students who adopt a White first name. In column 3, we restrict our sample to the domestic students only. Here, it turns out that once we control for students' social and economic characteristics, students with Chinese first and last names achieve a significantly higher WAM (3.3%) compared to Whites and Adopters. We see very similar results (Table A8 in Appendix 1) when we run similar specifications to explain students' ATAR – a broad based indicator of academic achievement at the secondary level of education.

To see the association between parents' socio-economic status (SES), and children's name adoption, we restrict our sample to students with Chinese last names, and regress their first name adoption status on their parent's SES. Table 7 presents the results. Consistent with the findings from the NSW birth registry data described in the next subsection, the likelihood of adopting a White first name is 37 percentage points higher when English is the reported language spoken at home. However, this White name adoption decreases by 7.4% for high-income parents, and about 10% for more educated parents.

[Table 7]

4.2 Further evidence from Birth Registry Data

To see if the association of using English as a spoken language at home by Australian born-Chinese households and their higher likelihood of adopting White names for their children holds for the Australian population in general, we collected birth records of all children born in NSW (where Sydney is located) in 1988, 1990, 1992, 2011 and 2013. The 1988 to 1992 birth years correspond to the birth years of our fictitious job applicants while the 2011 and 2013 birth years correspond to the study period. The birth records for each child include his/her given name, parents' country of birth, and postcode of the parents' residential address at the time of the birth of the child. The NSW birth record data allows us to a) categorize children's given names into White, Chinese, and others, and b) to categorize parents born in Australia, China, and elsewhere. We regress if a child at birth is given a White name or Chinese name on parents' country of birth categorized into China or Australia. Note that we include children-parent combinations only if both parents were born in China or one parent was born in China and the other in Australia. Given that data does not include family names, we cannot include children whose parents were born in Australia but are of Chinese ancestry. Results are presented in Table 8.

[Table 8]

The adoption of White names of children born in Australia by their Chinese parents is widespread; 87% of the Chinese parents gave their children a White first name. The likelihood of adopting a White first name by a Chinese parent increases further by 11% if one parent was born in Australia compared to when both parents were born in China. One parent born in Australia may indicate using English as a spoken language at home, which is consistent with

the results reported in the previous sub-section.³⁵ It could also signal a longer family history in Australia, or indicate an intention to stay in Australia permanently. Thus, children from these families assign a higher value to adopting a White name than if both parents are born in China and possibly might move back to China at some point. It could also suggest differences in English proficiency if neither parent is from Australia.³⁶ Thus, adopting a White first name by Chinese applicants provides a reliable signal of their language proficiency, and longer integration history to employers.³⁷

4.3 Evidence from an Employer Survey

In order to learn what inferences employers make from résumés with Chinese and Adopters names, we conducted an employer survey in April - May 2018. We randomly selected 700 employers who regularly employ university graduates from a list received from a large Australian university. The University maintains this list based on its regular past interactions with the employers, many of whom have employed its graduates in the past. Though these employers were primarily Sydney-based, given the little to no difference in discrimination found between Sydney- and Melbourne-based employers, we expect our results would hold for both cities. We emailed the employers inviting them to complete an online survey where we asked a series of questions about résumés similar to the ones used in our correspondence experiment. We did not offer any financial incentive to the respondents, and the survey response rate was about 15 percent.³⁸

³⁵ While not explored in our study, language differences that lead to different speech communities may result in discrimination against minorities as a competitive market outcome. See Lang (1986) for a theory where he develops this notion eloquently.

³⁶ It could also suggest that one parent is White. In other words, an adopter's name thus signals that s/he is of mixed ethnicity, which we cannot rule out.

³⁷ Our detection of behaviour is consistent with statistical discrimination in a similar manner to Gneezy, List and Price (2012) who find that the nature of discrimination faced by disabled persons in auto body shops is also consistent primarily with statistical discrimination.

³⁸ See Kessler, Low and Sullivan (2019) for a recently conducted incentive survey of CV ratings.

In the survey, each employer was sent only one résumé, and was asked to rate it on its education and qualification, skills and attributes, extra-curricular activities, likelihood of being offered an interview, and overall employability. In Appendix Table A9, we present logit marginal effects of applicants' race divided into Chinese and Adopter and controlling for employers' race. The results indicate that when employers evaluate an individual résumé, they consider résumés with Chinese first and last names and résumés with White first and Chinese last names identical to White résumés in terms of education and other hard skills.

Employers were also asked to evaluate the candidate in terms of his/her communication skills with potential clients, familiarity with Australian culture, compatibility with their organization's work and social culture, and integrity. In Appendix Table A10, we present logit marginal effects of applicants' race divided into Chinese and Adopter controlling for employers' race. While our low response rate combined with small size may not allow us to detect statistical significance here, there is some directional evidence that employers consider both Chinese and Adopters to be lower in soft skills. These findings are consistent with statistical discrimination in the high-skilled labor markets faced by Chinese applicants where employers' differential inferences on these unobserved soft skills might be detrimental to Chinese applicants.

5. Conclusions

The literature on racial discrimination in the labour market shows that sizeable racial gaps for racial minorities occur across a range of labour market outcomes, and these gaps remain after controlling for differences in human capital. In response to expected discrimination, minority job applicants signal their adoption of the majority culture. This paper explores how the magnitude of discrimination and the nature of discrimination in both low and high-skilled

markets differ between minority applicants who keep their minority identity, and minority applicants who explicitly signal their integration into the majority culture.

To capture the effect of adopting a White first name on the probability of receiving an interview offer, fictitious résumés were sent in response to real world job advertisements of entry level high-skilled and entry level low-skilled jobs using three name combinations: White first name and last name; Chinese first name and last name; and White first name and Chinese last name (the “Adopters”). The last names for the Adopter résumés are drawn from the same pool of last names as those used on the Chinese résumés, and thus, both Chinese and Adopter job applicants share an identical racial ancestry.

The main findings uncover a large racial gap in interview offers between White and Chinese names in both low-skilled and high-skilled markets; on average, Chinese names are 8 percentage points less likely to receive an interview offer and receive on average almost two-thirds fewer interview offers. With respect to the Adopter résumés, recruiters in both labour markets respond positively to Chinese job applicants who use a White first name. Adopters receive roughly double the number of interview offers relative to Chinese résumés, even though both types of applicants have a Chinese last name. However, the influence of a White first name on the probability of receiving an interview offer varies across skill levels. While we do not observe a complete elimination in the racial gap for Adopters in high-skilled jobs, the White-Adopter résumé racial gap is completely attenuated in the low-skilled jobs. Overall, using a White first name in the Australian labour market substantially reduces the level of racial bias against Chinese job seekers, particularly in low-skilled jobs.

The interview-offer gaps found in our correspondence study lines up with the overall employment difference between Chinese and White in high and low-skilled jobs. Given that most (87 percent or more) Chinese in Australia adopt White first names, the gaps observed in labour markets are more aligned to gaps between Adopters and Whites found in the experiment.

As an illustration, according to the HILDA data, the employment gaps are 3.6% among university graduates and 1% among high school graduates (Panel B in Table 1). In our experiment, the gaps uncovered in interview offers between White and Adopters are 6.3% and 1%, respectively (Table 5).

Prejudicial motives (Becker, 1971) could explain the result that adopting a White first name reduces discrimination in both high and low skill labour markets. Recruiters may have a preference toward minorities who abandon outward signifiers of ethnic identity in favour of demonstrating an affiliation with the White majority. Similarly, our results are also consistent with theories of statistical discrimination (Aigner and Cain, 1977; K. J. Arrow, 1972; Phelps, 1972). The use of a White first name by racial minorities may be correlated with other signals of productivity. For instance, Fryer and Levitt (2004) find that unique Black first names are an indicator of low socioeconomic status. Moreover, the greater reduction in discrimination in the low than high skill labour market for Adopters also appears to be consistent with statistical discrimination to the extent that there remains potentially more unobservable information on relevant job skills not listed in the résumés in the high than low skill jobs (e.g., soft skills).

We uncover a number of additional facts that are consistent with statistical discrimination. Based on the two sets of administrative data, we found that Adopter names do indeed signal different characteristics, including educational outcomes and a greater likelihood of possessing soft skills (as indicated by parental background), which is consistent with statistical discrimination. In the unskilled job market, Adopters' name provides a strong signal of the candidate's ability to speak native English, and at least one of the parents' longer association with Australia and perhaps overall stronger integration into the Australian society and culture. These signals indeed eliminate discrimination successfully in the unskilled job market.

In contrast, in the skilled market, the pool of Chinese applicants is a mixture of international and domestic applicants with the domestic pool being higher achievers whereas

the international applicants are much lower achievers, and this mixture might be disadvantaging the domestic pool. While we do not have information on the actual composition of the applicant pool for the jobs where we had sent our fictitious résumés, it is plausible to think that there would have been a much greater proportion of international to domestic applicants with Chinese first and last names in the overall applicant pool than the proportion of international to domestic applicants with Chinese last and White first names. If employers make interview offers commensurate with the average expected productivity of the applicant pool, and they assume a higher mixture of the international to domestic students among the Chinese than Adopter pools (and lower productivity among the international applicants as discussed above), then this would also be consistent with statistical discrimination causing greater discrimination among the Chinese than Adopter applicants.

Racial minorities may find it financially rational to adopt a White sounding first name in response to the labour market discrimination. Our research suggests that Chinese applicants can adopt a White first name as a signal that is potentially not otherwise terribly costly if they are already adopting other aspects of the culture of the domestic population. However, renouncing a racially-suggestive first name may be associated with large costs related to notions of individual identity (Akerlof and Kranton, 2000).

While our study has uncovered discrimination in the first step in the hiring process and attempted to shed light on the nature of discrimination in the correspondence studies, we want to note some potential limitations of our study. Similar to other correspondence studies, outcomes measured in this study are limited to racial (and gender) differences in interview offers, not in the hiring decisions. This and other limitations are discussed in Bertrand and Mullainathan (2004) and Bertrand and Duflo (2016), among others. An important assumption we make in this study is that the last name of the job applicant reliably signals the race of the candidate to the recruiter. A potential confounder of our experimental design is that the

Adopters could be regarded as mixed-race, rather than Chinese, as the ‘Adopters’ name type combines a White first name with a Chinese last name. Due to the traditional naming practice whereby children inherit the last name of their father, for an Adopter to be of mixed-race parentage, the particular racial combination of an Adopter’s parents must be Chinese father with White mother. However, there is evidence which demonstrates that firms discriminate on the perceived race of the worker, as inferred from an individual’s last name.³⁹

³⁹ Rubinstein and Brenner (2014) contrast the earnings of mixed-race Sephardic and Ashkenazi Jews in Israel and find that firms discriminate on the basis of the worker’s last name. For instance, mix-race Jews with a Sephardic father subsequently inherit a Sephardic last name, and were treated as if they were of ‘full’ Sephardic ancestry by firms. The wages of mixed-race workers with Sephardic last names are significantly lower than mixed-race workers with Ashkenazi last names, despite both groups being observably similar along various dimensions of human capital. Consequently, the authors argue that a person’s last name influences how the firm perceives the race of the worker.

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Figures and Tables

Figure 1: Interview Offer (%)

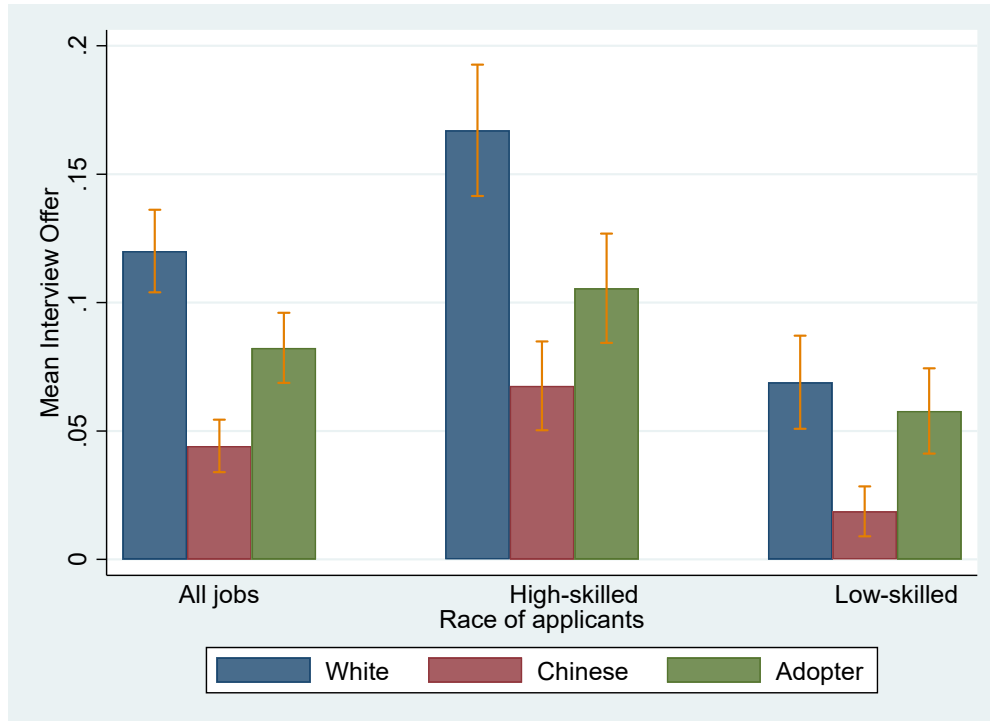


Figure 2

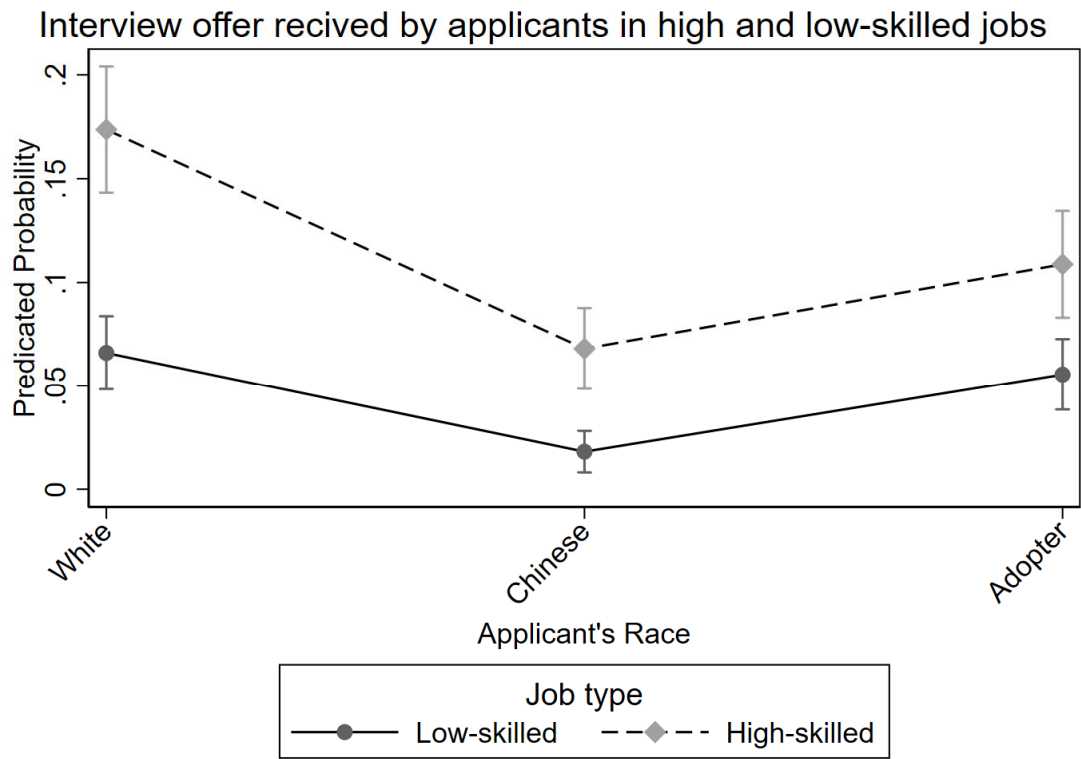


Figure 3

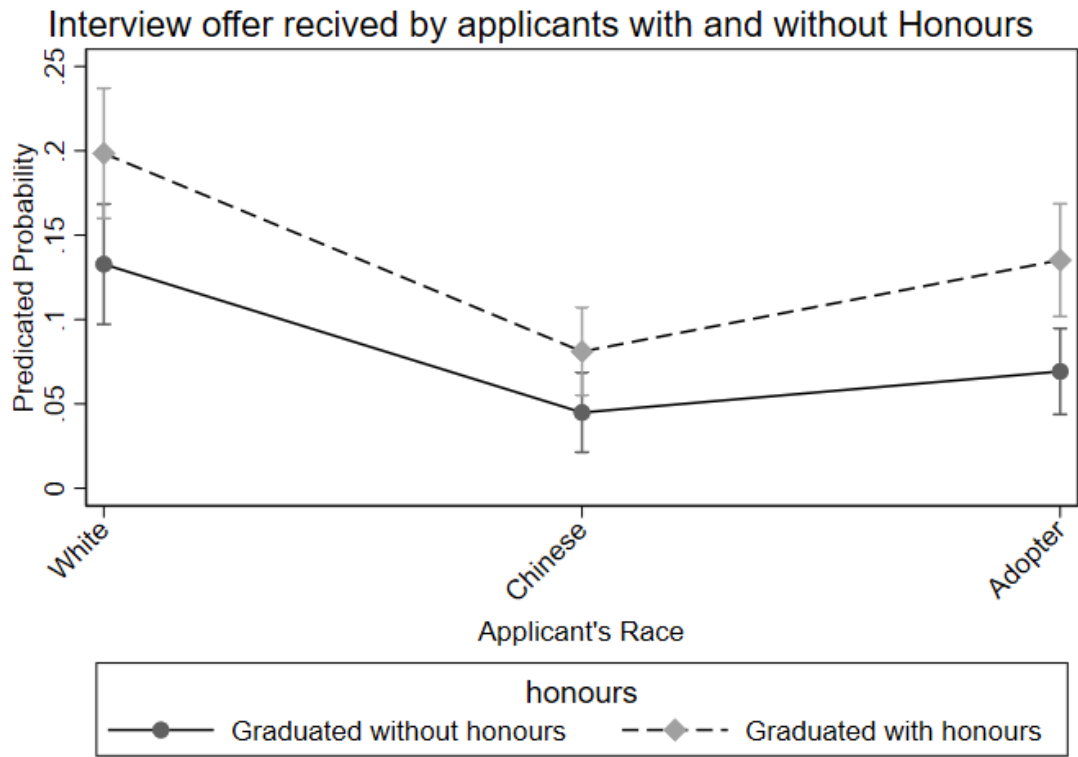


Table 1.
Background Characteristics of White and Chinese in Australia

	White (1)	Chinese (2)	Difference (1)-(2)
<i>Panel A: Parental background and educational investment</i>			
Father's schooling	12.495 (0.013)	11.645 (0.175)	0.850***
Mother's schooling	11.975 (0.012)	10.186 (0.186)	1.789***
Log education spending (annual)	7.011 (0.008)	7.613 (0.075)	-0.602***
Attend university	0.622 (0.009)	0.812 (0.070)	-0.190**
<i>Panel B: Employment and wage gap</i>			
Log hourly wage – university graduate	3.359 (0.004)	3.282 (0.030)	0.077***
Log hourly wage – high school graduate	2.918 (0.003)	2.894 (0.027)	0.024
Log Hourly Wage- business	3.391 (0.009)	3.235 (0.043)	0.156***
Log Hourly Wage- admin	3.054 (0.007)	2.963 (0.006)	0.091*
Proportion Employed – university graduate	0.983 (0.001)	0.947 (0.011)	0.036***
Proportion Employed – high school graduate	0.929 (0.001)	0.920 (0.016)	0.009

*** p < 0.01, ** p < 0.05, * p < 0.10. The sample size consists of N = 93,996.

The sample size consists of N = 24,552

Standard errors are reported in parentheses. Source: HILDA Survey, Waves 1-13

Table 2: Distribution of Recruiters' Responses

Outcomes	(1) Mean	(2) Standard deviation
At least one interview offer made by the firm	0.229	0.420
No interview offered by the firm	0.771	0.420
Exactly one interview offer made by the firm	0.132	0.338
Exactly two interview offers made by the firm	0.0536	0.225
At least one call back by the firm	0.382	0.486
No call backed by the firm	0.618	0.486
Interviews offered to all applicants	0.013	0.113
Interview Offer - White only	0.041	0.197
If only one interview offered – White only	0.342	0.475
If exactly two interviews offered – White only	0.353	0.479
Call back - White only	0.079	0.269
Interview Offer - Chinese only	0.014	0.118
Call back - Chinese only	0.052	0.221
Interview Offer - adopter only	0.028	0.164
Call back - adopter only	0.069	0.253

Table 3: Summary of outcomes by applicants' category

Variable	(1) White		(2) Chinese		(3) Adopter		t-test (1)-(2)	t-test (1)-(3)	t-test (2)-(3)
	N	Mean/SE	N	Mean/SE	N	Mean/SE	Difference	Difference	Difference
Interview offer (IO) received or not	1588	0.120 [0.008]	1530	0.043 [0.005]	1584	0.082 [0.007]	0.077***	0.038***	-0.039***
Received a call back (CB) or not	1588	0.232 [0.011]	1530	0.159 [0.009]	1584	0.205 [0.010]	0.074***	0.028*	-0.046***
Received an IO conditional on CB (IOCB)	369	0.518 [0.026]	243	0.272 [0.029]	324	0.401 [0.027]	0.246***	0.116***	-0.130***
CB, high-skilled	830	0.293 [0.016]	787	0.202 [0.014]	821	0.245 [0.015]	0.091***	0.048**	-0.043**
IO, high-skilled	830	0.167 [0.013]	787	0.066 [0.009]	821	0.105 [0.011]	0.101***	0.063***	-0.039***
IOCB, high-skilled	243	0.572 [0.032]	159	0.327 [0.037]	201	0.428 [0.035]	0.245***	0.144***	-0.101*
CB, low-skilled	758	0.166 [0.014]	743	0.113 [0.012]	763	0.161 [0.013]	0.053***	0.005	-0.048***
IO, low-skilled	758	0.069 [0.009]	743	0.019 [0.005]	763	0.058 [0.008]	0.050***	0.011	-0.039***
IOCB, low-skilled	126	0.413 [0.044]	84	0.167 [0.041]	123	0.358 [0.043]	0.246***	0.055	-0.191***
CB, Female	815	0.254 [0.015]	767	0.150 [0.013]	783	0.212 [0.015]	0.104***	0.042**	-0.062***
IO, Female	815	0.140 [0.012]	767	0.042 [0.007]	783	0.092 [0.010]	0.098***	0.048***	-0.050***
IOCB, Female	207	0.551 [0.035]	115	0.278 [0.042]	166	0.434 [0.039]	0.272***	0.117**	-0.155***
CB, Business	1277	0.226 [0.012]	1246	0.161 [0.010]	1273	0.208 [0.011]	0.065***	0.017	-0.048***
IO, Business	1277	0.114 [0.009]	1246	0.043 [0.006]	1273	0.081 [0.008]	0.071***	0.033***	-0.038***
IOCB, Business	288	0.507 [0.030]	200	0.270 [0.031]	265	0.389 [0.030]	0.237***	0.118***	-0.119***
CB, Sydney	882	0.246 [0.015]	886	0.161 [0.012]	908	0.214 [0.014]	0.085***	0.032	-0.052***
IO, Sydney	882	0.142 [0.012]	886	0.046 [0.007]	908	0.095 [0.010]	0.095***	0.047***	-0.048***
IOCB, Sydney	217	0.576 [0.034]	143	0.287 [0.038]	194	0.443 [0.036]	0.289***	0.133***	-0.157***
CB, Melbourne	706	0.215 [0.015]	644	0.155 [0.014]	676	0.192 [0.015]	0.060***	0.023	-0.037*
IO, Melbourne	706	0.093 [0.011]	644	0.039 [0.008]	676	0.065 [0.009]	0.055***	0.028*	-0.026**

The value displayed for t-tests are the differences in the means across the groups.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 4. Full Sample – Logit Marginal Effects

	(1)	(2)	(3)	(4)	(5)
	Interview	Interview	Call	IO conditional on CB	Interview
	Offer (IO)	Offer (IO)	Back (CB)	(IOCB)	Offer (IO)
Race of the applicant = Chinese	-0.077*** (0.009)	-0.077*** (0.009)	-0.073*** (0.012)	-0.240*** (0.032)	-0.077*** (0.009)
Race of the applicant = Adopter	-0.038*** (0.009)	-0.038*** (0.009)	-0.027** (0.012)	-0.109*** (0.03)	-0.038*** (0.009)
Job type, high-skilled = 1, low-skilled = 0		0.074*** (0.013)	0.122*** (0.021)	0.123** (0.052)	0.071*** (0.012)
Female applicant		0.020** (0.008)	0.015 (0.01)	0.062** (0.029)	0.020** (0.008)
Sydney-based recruiter		0.021* (0.011)	0.005 (0.019)	0.088* (0.047)	0.021* (0.011)
Business sector job		0.024 (0.015)	0.063** (0.025)	0.003 (0.063)	0.024 (0.015)
Chinese # High-skilled					0.068*** (0.01)
Adopter # High-skilled					0.109*** (0.013)
Observations	4,702	4,702	4,702	936	4,702
Log likelihood	-1305	-1295	-2331	-608.4	-1259
pseudo-R-squared	0.024	0.032	0.007	0.041	0.058
Mean - White applicants	0.120	0.120	0.232	0.518	0.120
p-value for F-test: Chinese=Adopter	0.000	0.000	0.000	0.000	0.000
p-value for F-test: Chinese*high=Adopter*high					0.050

Standard errors in parentheses are clustered at firm level. *** p<0.01; **p<0.05; *p<0.1

Table 5. Racial Gap by Skill Level - Logit Marginal Effects

	(1)	(2)	(3)	(4)	(5)
	Interview	Interview	Call	IO	Interview
	Offer (IO)	Offer (IO)	Back (CB)	conditional on CB (IOCB)	Offer (IO)
Panel A - High-skilled market					
Race of the applicant = Chinese	-0.101*** (0.014)	-0.102*** (0.014)	-0.092*** (0.018)	-0.247*** (0.040)	-0.104*** (0.014)
Race of the applicant = Adopter	-0.063*** (0.014)	-0.063*** (0.014)	-0.048*** (0.018)	-0.147*** (0.038)	-0.063*** (0.014)
Female applicant		0.008 (0.012)	0.000 (0.014)	0.023 (0.036)	0.007 (0.012)
Sydney-based company		0.032 (0.020)	0.011 (0.029)	0.107* (0.062)	0.030 (0.020)
Business sector job		0.031 (0.020)	0.073** (0.029)	0.001 (0.066)	0.032 (0.020)
Applicant graduated with Honours					0.056*** (0.012)
Chinese #Graduated with Honours					0.081*** (0.0133)
Adopter #Graduated with Honours					0.135*** (0.017)
No. of observations	2,438	2,438	2,438	603	2,438
Log likelihood	-841.9	-835.5	-1346	-400.1	-825.3
pseudo-R-squared	0.025	0.032	0.013	0.038	0.044
Mean - White applicants	0.167	0.167	0.293	0.572	0.132
p-value for F-test: Chinese=Adopter	0.002	0.001	0.006	0.016	0.171
p-value for F-test: Chinese*h=Adopter*h					0.003
Panel B: Low-skilled market					
Race of the applicant = Chinese	-0.050*** (0.010)	-0.050*** (0.010)	-0.053*** (0.014)	-0.229*** (0.053)	
Race of the applicant = Adopter	-0.011 (0.011)	-0.011 (0.011)	-0.005 (0.015)	-0.036 (0.050)	
Female applicant		0.033*** (0.010)	0.030** (0.012)	0.141*** (0.048)	
Sydney-based company		0.010 (0.011)	-0.001 (0.024)	0.050 (0.069)	
No. of observations	2,264	2,264	2,264	333	
Log likelihood	-427.2	-420.1	-938.1	-199	
pseudo-R-squared	0.029	0.0451	0.00785	0.058	
Mean - white applicants	0.069	0.069	0.166	0.413	
p-value for F-test: Chinese=Adopter	0.000	0.000	0.001	0.001	

Standard errors in parentheses are clustered at firm level. *** p<0.01; **p<0.05; *p<0.1

Table 6: Names and Academic Achievements (WAM) – OLS regression results

	(1) WAM - course foe	(2) WAM - domestic or international	(3) WAM - parental background	(4) WAM - >=50
Race of the applicant = Chinese	-3.721*** (0.536)		2.218* (0.927)	0.976* (0.477)
Race of the applicant = Adopter	-1.932** (0.626)		0.795 (0.893)	0.274 (0.360)
Chinese students - domestic		0.473 (0.652)		
Chinese students - international		-6.440*** (0.541)		
Adopter – domestic students		-0.977 (0.603)		
Adopter - international students		-6.911*** (0.554)		
Socio-economic indicator=low			-1.462 (0.831)	-0.737** (0.279)
Socio-economic indicator=middle			-0.179 (0.251)	0.069 (0.154)
Language spoken at home is English			0.867 (0.600)	0.931** (0.309)
Parent 1 education = Post school qualifications			-0.957** (0.276)	-0.503*** (0.111)
Parent 1 education = Postgraduate			0.105 (0.347)	0.141 (0.088)
Parent 1 education = Year 10 or equivalent			-2.411*** (0.629)	-1.380*** (0.125)
Parent 1 education = Year 12 or equivalent			-2.356*** (0.399)	-1.300*** (0.189)
Observations	30,176	30,176	16,609	14,942
R-squared	0.069	0.075	0.071	0.137
Mean - white applicants	65.83	65.83	66.1	71.19
p-value for F-test: Chinese=Adopter	0.002		0.062	0.109
p-value for F-test: Chinese domestic = Chinese international		0.000		
p-value for F-test: Adopter domestic = Adopter international		0.000		

Robust standard errors in parentheses are clustered at birth year. *** p<0.01; ** p<0.05; * p<0.1. All regressions control for the year of birth, Field of Education (FOE) and course level. Columns 3 and 4 are limited to domestic students (for international students, parents' characteristics are not available in the data sets).

Table 7. Socio-Economic Status and White first name adoption - Logit Marginal Effects**Dep. Var: Adopted White first name=1, kept Chinese first name=0**

VARIABLES	(1) Adopted White first name=1 kept Chinese first name=0	(2) Adopted White first name=1 kept Chinese first name=0	(3) Adopted White first name=1 kept Chinese first name=0	(4) Adopted White first name=1 kept Chinese first name=0
Language spoken at home: English=1, Others=0	0.369*** (0.025)			0.226*** (0.029)
Low and middle income=0, high income=1		-0.074*** (0.021)		-0.035 (0.027)
Parental education: Below bachelor=0, bachelor and postgraduate=1			-0.100*** (0.018)	-0.123*** (0.017)
No. of observations	12,966	6,655	6,874	3,153
Log likelihood	-8177	-4494	-4169	-2090
pseudo-R-squared	0.036	0.010	0.037	0.038

All regressions control for the year of birth. Due to item missing in the data set, the number of observations varies in different specifications. Robust standard errors in parentheses are clustered at birth year. *** p<0.01; ** p<0.05; * p<0.1.

Table 8. Name at birth from the NSW birth registry data - Logit marginal effects

Dep. Var: Adopted White first name=1, kept Chinese first name=0

VARIABLES	(1) White Name Adoption
Both parents born in China =0, one parent born in Australia = 1	0.112*** (0.011)
Observations	7,141
Log likelihood	-2543
pseudo-R-squared	0.027
Mean - Chinese parents	0.865

Standard errors in parentheses are clustered at postcode level. *** p<0.01, **p<0.05, *p<0.1
Additional control includes children's birthyear.

Appendix

Table A1. Highest Grade Completed

	White (1)	Chinese (2)	Difference (1)-(2)
High School Dropout (less than 12 years)	0.376 (0.001)	0.116 (0.007)	0.260***
High School Graduate	0.151 (0.001)	0.201 (0.001)	-0.050***
College	0.200 (0.001)	0.077 (0.006)	0.123***
Diploma	0.081 (0.001)	0.154 (0.009)	-0.073***
Bachelor	0.116 (0.001)	0.267 (0.011)	-0.151***
Graduate Diploma	0.046 (0.001)	0.065 (0.006)	-0.019***
Postgraduate Degree	0.027 (0.001)	0.118 (0.008)	-0.091***

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.
 The sample size consists of $N = 144,446$.
 Standard errors are reported in parentheses.
 Source: HILDA, Waves 1-13.

Table A2: Evolution of Chinese and White Outcomes

<i>Panel A. Wage Gap by Education</i>																		
	2001						2006						2011					
	University			High School			University			High School			University			High School		
	White (1)	Chinese (2)	Difference (1)-(2)	White (1)	Chinese (2)	Difference (1)-(2)	White (1)	Chinese (2)	Difference (1)-(2)	White (1)	Chinese (2)	Difference (1)-(2)	White (1)	Chinese (2)	Difference (1)-(2)	White (1)	Chinese (2)	Difference (1)-(2)
Log Hourly Wage	3.158 (0.006)	3.039 (0.021)	0.119** *	2.874 (0.004)	2.903 (0.016)	-0.029*	3.410 (0.006)	3.180 (0.017)	0.230** *	3.049 (0.003)	3.011 (0.012)	0.038** *	3.603 (0.005)	3.405 (0.013)	0.198** *	3.285 (0.003)	3.256 (0.010)	0.029** *
<i>Panel B. Employment Gap by Education</i>																		
	2001						2006						2011					
	University			High School			University			High School			University			High School		
	White (1)	Chinese (2)	Difference (1)-(2)	White (1)	Chinese (2)	Difference (1)-(2)	White (1)	Chinese (2)	Difference (1)-(2)	White (1)	Chinese (2)	Difference (1)-(2)	White (1)	Chinese (2)	Difference (1)-(2)	White (1)	Chinese (2)	Difference (1)-(2)
Proportion Employed	0.975 (0.001)	0.926 (0.009)	0.049** *	0.937 (0.001)	0.895 (0.007)	0.042** *	0.983 (0.001)	0.936 (0.006)	0.047** *	0.954 (0.001)	0.918 (0.004)	0.036** *	0.980 (0.001)	0.933 (0.005)	0.047** *	0.951 (0.001)	0.914 (0.004)	0.037** *
<i>Panel C. Wage Gap by Occupation</i>																		
	2001						2006						2011					
	Business			Admin			Business			Admin			Business			Admin		
	White (1)	Chinese (2)	Difference (1)-(2)	White (1)	Chinese (2)	Difference (1)-(2)	White (1)	Chinese (2)	Difference (1)-(2)	White (1)	Chinese (2)	Difference (1)-(2)	White (1)	Chinese (2)	Difference (1)-(2)	White (1)	Chinese (2)	Difference (1)-(2)
Log Hourly Wage	2.929 (0.008)	2.820 (0.045)	0.109** *	2.721 (0.005)	2.721 (0.026)	0	3.271 (0.010)	3.202 (0.026)	0.069**	2.967 (0.018)	2.890 (0.075)	0.077	3.471 (0.009)	3.450 (0.020)	0.021	3.214 (0.018)	3.031 (0.056)	0.183** *

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. The sample size consists of $N = 22,848$. Standard errors are reported in parentheses. Source: Census 1% CURF

Table A3. Occupation Categories

Education Level	Sector
1) Graduate	
Business	Accounting Finance Economics Human Resources Marketing
Engineering	Civil Mechanical
2) High School	
Administration	Administration Assistant

For the graduate jobs, the degree majors that are categorised as Business jobs are accounting, finance, economics, human resources, and marketing. The Engineering graduate jobs included in the study are mechanical and civil engineering degrees.

Table A4. First and Last Names

White Male	White Female	White Last Name	Chinese Male	Chinese Female	Chinese Last Name
Matthew	Jessica	Smith	Ming	Ying	Li
James	Sarah	Jones	Wei Feng	Qingmei	Wang
Daniel	Emily	Williams	Yun Long	Ailing	Zhang
Joshua	Stephanie	Brown	Xiong	Wei	Liu
Michael	Emma	Wilson	Huangfu	Li Ping	Chen
Thomas	Rebecca	Taylor	Feng	Mei Li	Yang
Nicholas	Samantha	Johnson	Shengli	Li Fen	Huang
Jack	Lauren	Martin	Xiaoping	Jiaying	Zhao
Benjamin	Laura	White	Jian	Ming Yu	Wu
Patrick	Georgia	Anderson	Xiaogang	Xiaojing	Zhou
Adam	Ashleigh	Chapman	Xiaoming	Lihui	Cheng
Aaron	Courtney	Fletcher	Benshan	Xiyuan	Lin
Andrew	Rachel	Stevens	Jianguo	Chi Ling	Liang
David	Nicole	Cooper	Ding Xiang	Ai Shi	Zheng

Table A5: Summary statistics and randomization balance checks

		(1)		(2)		(3)	t-test	t-test	t-test
		White		Asian		Adopter	(1)-(2)	(1)-(3)	(2)-(3)
	N	Mean/SE	N	Mean/SE	N	Mean/SE	Difference	Difference	Difference
Female applicant	1588	0.513 [0.013]	1530	0.501 [0.013]	1584	0.494 [0.013]	0.012	0.019	0.007
Melbourne-based company	1588	0.445 [0.012]	1530	0.421 [0.013]	1584	0.427 [0.012]	0.024	0.018	-0.006
Sydney-based company	1588	0.555 [0.012]	1530	0.579 [0.013]	1584	0.573 [0.012]	-0.024	-0.018	0.006
Applicant with graduate education	1588	0.523 [0.013]	1530	0.514 [0.013]	1584	0.518 [0.013]	0.008	0.004	-0.004
Applicant graduated with honours	1588	0.280 [0.011]	1530	0.297 [0.012]	1584	0.280 [0.011]	-0.018	-0.001	0.017
Business sector job	1588	0.804 [0.010]	1530	0.814 [0.010]	1584	0.804 [0.010]	-0.010	0.000	0.011
Low-skilled job	1588	0.477 [0.013]	1530	0.486 [0.013]	1584	0.482 [0.013]	-0.008	-0.004	0.004
High-skilled job	1588	0.523 [0.013]	1530	0.514 [0.013]	1584	0.518 [0.013]	0.008	0.004	-0.004
Female Recruiter	386	0.692 [0.024]	308	0.724 [0.026]	339	0.752 [0.023]	-0.032	-0.061*	-0.028
White Recruiter	375	0.864 [0.018]	301	0.844 [0.021]	324	0.873 [0.018]	0.020	-0.009	-0.030
Recruiter experience in years	279	11.491 [0.463]	231	10.831 [0.479]	241	11.378 [0.494]	0.660	0.113	-0.546

The value displayed for t-tests are the differences in the means across the groups.

***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table A6: Effects of Locations, Sectors, Firm Size, and Recruiters Characteristics on Interview Offers (IO)

	(1) IO - Sydney Based Firms	(2) IO- Melbourne Based Firms	(3) IO- Listed in ASX	(4) IO – Recruit- er Charact- eristics
Panel A - High-skilled market				
Race of the applicant = Chinese	-0.118*** (0.019)	-0.077*** (0.019)	-0.105*** (0.014)	-0.151*** (0.040)
Race of the applicant = Adopter	-0.071*** (0.019)	-0.051*** (0.019)	-0.065*** (0.015)	-0.108*** (0.041)
Female applicant	0.022 (0.014)	-0.016 (0.021)	0.007 (0.012)	0.045 (0.032)
Business sector job	0.036 (0.027)	0.024 (0.028)	0.037* (0.021)	0.085 (0.054)
Firm listed in the ASX			0.005 (0.027)	0.030 (0.076)
Female Recruiter				-0.103* (0.054)
White Recruiter				-0.202*** (0.060)
Recruiter experience in years				-0.002 (0.003)
No. of observations	1,506	932	2,318	521
Log likelihood	-551.9	-282.5	-800.8	-255.7
pseudo-R-squared	0.033	0.023	0.031	0.091
Mean - white applicants	0.190	0.134	0.171	0.314
p-value for F-test: Chinese=Adopter	0.006	0.125	0.002	0.219
Panel B: Low-skilled market				
Race of the applicant = Chinese	-0.063*** (0.015)	-0.035*** (0.013)	-0.051*** (0.010)	-0.158*** (0.054)
Race of the applicant = Adopter	-0.013 (0.015)	-0.009 (0.015)	-0.012 (0.011)	-0.052 (0.055)
Female applicant	0.046*** (0.016)	0.021 (0.013)	0.035*** (0.011)	0.126*** (0.044)
Firm listed in the ASX			0.015 (0.019)	0.070 (0.077)
Female Recruiter				-0.065 (0.102)
White Recruiter				-0.158* (0.090)
Recruiter experience in years				-0.000 (0.005)
No. of observations	1,170	1,094	2,186	208
Log likelihood	-226.3	-192.5	-406.6	-83.52
pseudo-R-squared	0.067	0.023	0.048	0.114
Mean - white applicants	0.079	0.058	0.070	0.237
p-value for F-test: Chinese=Adopter	0.000	0.049	0.000	0.133

Standard errors in parentheses are clustered at firm level. *** p<0.01; **p<0.05; *p<0.1

Table A7: Results from Heteroskedastic Probit Estimates

	Chinese (1)	Adopter (2)
A. Estimates from basic probit		
Race	-0.074** (0.009)	-0.032** (0.009)
B. Heteroskedastic probit model		
Race (unbiased estimates)	-0.072** (0.01)	-0.031** (0.009)
Marginal effect of race through level	-0.08** (0.039)	-0.092** (0.041)
Marginal effect of race through variance	0.008 (0.045)	0.062 (0.045)
Standard deviation of unobservables, Chinese/White, Adopter/White	1.043	1.331
Wald test statistic, null hypothesis that ratio of standard deviations=1 (p-value)	0.859	0.247
Wald test statistic, null hypothesis that ratios of coefficients for whites relative to Chinese (Adopters) are equal, fully interactive probit model (p-value)	1	0.862
Test over identifying restrictions: include in heteroskedastic probit model interactions for variables with $ \text{White coefficient} < \text{Chinese coefficient (Adopter coefficient)}$, Wald test for joint significance of interactions (p-value)	0.388	0.56
No of observations	3118	3172

In Panel B the marginal effects reported, with the decomposition immediately below; the marginal effects are evaluated at sample means. The standard errors for the two components of the marginal effects are computed using the delta method. Test statistics are based on the variance-covariance matrix clustering on the ad to which the applicants responded.

Table A8: Name and ATAR – OLS regression results

	(1) ATAR - Year of birth	(2) ATAR - Domestic or international	(3) ATAR - Race & origin interactions	(4) ATAR - parents	(5) ATAR >=50
Race of the applicant = Chinese	1.743*** (0.331)	2.653*** (0.295)	2.651 (4.273)	1.804** (0.614)	1.804** (0.614)
Race of the applicant = Adopter	1.284*** (0.071)	1.501*** (0.133)	2.595 (3.645)	2.097*** (0.438)	2.097*** (0.438)
SES indicator = low				-1.776*** (0.364)	-1.776*** (0.364)
SES indicator = middle				-0.679*** (0.040)	-0.679*** (0.040)
Language spoken at home, English=1				0.008 (0.752)	0.008 (0.752)
Parent 1 education = Post school qualifications				-1.821*** (0.268)	-1.821*** (0.268)
Parent 1 education = Postgraduate				0.450 (0.366)	0.450 (0.366)
Parent 1 education = Year 10 or equivalent				-2.238*** (0.229)	-2.238*** (0.229)
Parent 1 education = Year 12 or equivalent				-1.552*** (0.164)	-1.552*** (0.164)
Domestic student=1, international=0		4.091*** (0.511)	4.329 (3.841)		
Chinese # domestic			0.072 (4.353)		
Adopter # domestic			-1.143 (3.697)		
Observations	12,368	12,368	12,368	3,622	3,622
R-squared	0.010	0.018	0.018	0.049	0.049
Mean - white applicants	90.07	90.07	90.07	90.51	90.51
p-value for F-test: Chinese=Adopter	0.255	0.0153	0.964	0.452	0.452

Robust standard errors in parentheses are clustered at birth year. *** p<0.01; ** p<0.05; * p<0.1. All regressions control for the year of birth, field of education (foe) and course level. Columns 4 and 5 is limited to domestic students (parents' characteristics etc are not available for international students in the data sets)

Table A9. Name and perceived hard skill differences - logit marginal effects

VARIABLES	Education & qualification of applicant	Skills & attributes of applicant	Extra- curricular activities of applicant	Likelihood of interview	Overall employability of applicant
Applicant's race = Chinese	0.009 (0.095)	-0.033 (0.122)	-0.122 (0.121)	-0.042 (0.116)	0.115 (0.116)
Applicant's race = Adopter	-0.062 (0.097)	-0.046 (0.118)	-0.104 (0.117)	-0.261** (0.114)	-0.097 (0.117)
Employer's race = Adopter	0.155 (0.149)	-0.025 (0.165)	-0.065 (0.164)	-0.072 (0.159)	-0.141 (0.160)
Employer's race = White	0.191 (0.126)	0.093 (0.136)	0.089 (0.135)	0.111 (0.132)	0.126 (0.133)
Observations	106	107	107	107	107
Log likelihood	-52.581	-72.215	-72.05258	-69.62058	-68.99774
Pseudo-R-squared	0.0287	0.008	0.0180	0.0512	0.0524

White applicants are the omitted category. In case of employers' race, all others are put together and used as the omitted category. *** p<0.01; ** p<0.05; * p<0.1.

Table A10. Name and perceived soft skill differences - logit marginal effects

VARIABLES	(1) Communication skills with clients	(2) Familiarity with aus culture	(3) Compatability with organizational work culture	(4) Compatability with organizational social culture	(5) Likelihood of high integrety
Applicant's race = Chinese	-0.112 (0.127)	-0.110 (0.116)	-0.110 (0.116)	-0.077 (0.136)	-0.297** (0.133)
Applicant's race = Adopter	-0.271** (0.124)	-0.135 (0.112)	-0.135 (0.112)	-0.048 (0.131)	-0.206 (0.135)
Employer's race = Adopter	0.063 (0.179)	-0.128 (0.156)	-0.128 (0.156)	-0.172 (0.169)	0.005 (0.184)
Employer's race = White	0.048 (0.153)	-0.102 (0.125)	-0.102 (0.125)	-0.189 (0.138)	-0.099 (0.153)
Observations	87	87	87	86	85
Log likelihood	-55.925	-48.999	-49.000	-56.622	-55.185
Pseudo-R-squared	0.039	0.025	0.025	0.019	0.052

White applicants are the omitted category. In case of employers race, all others are put together and used as the omitted category. *** p<0.01; ** p<0.05; * p<0.1.