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Utilising Self-report Data to Measure Racial Discrimination in the Labour Market

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Abstract

Although economists have developed a series of approaches to modelling the existence of labour market discrimination, rarely is this topic examined by analysing self-report survey data. After reviewing theories and empirical models of labour market discrimination, we examine self-reported experience of discrimination at different stages in the labour market, among three racial groups utilising U.S. data from the 2001-2003 National Survey of American Life. Our findings indicate that African Americans and Caribbean blacks consistently report more experience of discrimination in the labour market than their non-Hispanic white counterparts. At different stages of the labour market, including hiring, termination and promotion, these groups are more likely to report discrimination than non-Hispanic whites. After controlling for social desirability bias and several human capital and socio-demographic covariates, the results remain robust for African Americans. However, the findings for Caribbean blacks were no longer significant after adjusting for social desirability bias. Although self-report data is rarely utilised to assess racial discrimination in labour economics, our study confirms the utility of this approach as demonstrated in similar research from other disciplines. Our results indicate that after adjusting for relevant confounders self-report survey data is a viable approach to estimating racial discrimination in the labour market. Implications of the study and directions for future research are provided.

JEL Classification: J010, J150, J310, J700

1. Introduction

Economists have developed a series of approaches to modelling the existence of labour market discrimination within the neoclassical framework, with the three most influential models in the literature being: the taste for discrimination (Becker, 1957),

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the statistical discrimination (Arrow, 1971; and Phelps, 1972), and the crowding model (Bergman, 1974). These models have entailed the development of a range of measurement approaches to empirically estimate discrimination in the market place. These include: analyses of observational data; direct experiments (Riach and Rich, 1991); and attitudinal/behavioural studies (Bobo, 2000; and Jackman, 1994). The observational method involves either decomposition techniques (Blinder, 1973; and Oaxaca, 1973) or causal inference methods (Dempster, 1988; Holland, 1986; and Rubin, 1974). In both cases the emphasis is on the residual (unexplained) component of the regression models. Direct experiments, on the other hand, attempt to make comparison among equals by controlling for possible heterogeneity. This method was successfully utilised in measuring hiring discrimination although it is not without criticism. However, indirect observation methods were rarely able to objectively detect all forms of discrimination. Self-report data represents an alternative method of measuring discrimination. The question with this approach is, whether it is possible to validly measure the occurrence of discrimination based on the experiences of targets. In this paper, we explore the attitudinal/behavioural approach to assess labour market discrimination (based on self-report data), as a relatively under-utilised approach in labour economics literature. Using alternative nationally representative data, our purpose is to assess the occurrence of discrimination at the entry, on the job, and termination stages of the labour market. We begin by reviewing theoretical approaches to understanding labour market discrimination before detailing empirical approaches to modelling labour market discrimination. We then examine self-reported experience of discrimination at different stages in the labour market utilising U.S. data from the 2001-2003 National Survey of American Life (NSAL). This review and empirical analysis illustrates the viability of utilising self-report survey data to estimate racial discrimination in the labour market.

Theories of labour market discrimination

Becker's *taste for discrimination* model was the first to explain labour market discrimination. This model holds that discrimination occurs as a result of employers' taste to discriminate against some groups (Becker, 1957; 1971). The phrase *taste for discrimination* refers to the preparedness or willingness of agents (e.g. employers, employees, and consumers) to incur some costs (or loss of income) in order to avoid being associated with certain group(s).[1] For example, white/male employers may have a taste to discriminate against black/female workers. This implies that discriminating employers incur additional cost, the discrimination premium, on top of their other costs. Thus, according to this theory, discrimination cannot survive in the long run as competition would drive discriminating employers out of the market.

Phelps's *theory of statistical discrimination* models discrimination as occurring when individuals are judged based on 'the average characteristics of the group' they belong to rather than upon their personal characteristics (Phelps, 1972). Even though an individual black person may have better skills and abilities than the

[1] In the words of Becker (1971), 'If an individual has 'taste for discrimination' he must act *as if* he were willing to pay something, either directly or in the form of a reduced income, to be associated with some persons instead of others' (p. 14, emphasis in the original).

average white person, the black person would be treated like the average black person. This happens if employers take race as a proxy for skills and abilities. Arrow (1971, p. vi) also suggests that 'skin colour is cheap source of information' for employers who find that individually evaluating job applicants is costly. Thus, a profit maximising employer could actually be discriminating against blacks in the absence of personal prejudice. For example, the fact that blacks (in U.S., U.K. as well as indigenous and immigrant groups in Australia) are at a disadvantage in the racial gap in schooling quality (Awofeso, 2011; Dunn, 2004; Evans and Kelly, 1991; O'Neill, 1990; Paradies and Cunningham, 2009; and Smith, 1984), makes them prone to stereotyping and hence statistical discrimination in the labour market.

The crowding model (occupational segregation) considers discrimination in terms of productivity (Bergman, 1974, 1989). In this model, employers consider 'team' effort to be essential for performance. But they fear that some workers may be disgruntled by working with members of minority groups (e.g. blacks or females) (England and Lewin, 1989). Fearing this could affect productivity, they discriminate against minorities in their hiring decisions (Braddock II and McPartland, 1987; and Kirschenman and Neckerman, 1991). Whether such perception is valid has been subjected to considerable scrutiny. There is a range of conflicting evidence in terms of the effects of racial diversity in the workplace. Some studies indicate that such diversity is associated with improved productivity (Pérotin, Robinson and Loundes, 2003; and Putnam, 2007), including increased sales revenue, more customers, greater market share and greater relative profits (Herring, 2009). Diversity has also been associated with creativity and innovative thinking (Adler, 1996; McLeod, Lobel and Cox, 1996; and Richard, 2000), greater employee commitment, larger market share and better customer satisfaction (Bertone and Leahy, 2001), improved student wellbeing in schools (Juvonen, Nishina and Graham, 2006) as well as augmented social capital (Putnam, 2007). In contrast, other research suggests that racial diversity can reduce staff morale and productivity, provoke conflict between employees and managers, and harm social cohesion (Kochan *et al*., 2003; Roberson and Kulick, 2007; Prasad, *et al*., 1997; and Wrench, 2005).

Researchers have also modelled occupational segregation within the market structure framework to replicate the evolution of discrimination with the influence of market power (Kauffman, 1986; and Kauffman and Daymont, 1981). In addition, Aigner and Cain (1977) digress from Phelps' model of statistical discrimination, to suggest an alternative way of interpreting occupational segregation, where firms provide different wage structure/schedule to workers based on race or gender. This supposedly results in blacks/women cutting their investment in the development of their human capital in response to their steep wage schedule. The result is that blacks/women become concentrated in low paying jobs.

Empirical models of labour market discrimination

During the 1970s, the emphasis in this body of literature shifted from theoretical to empirical research with the pioneering works of Blinder (1973) and Oaxaca (1973). These two studies estimate the differentials in white-black as well as male-female wage rates by decomposing them into their causes. Blinder (1973) studied both white-black

as well as male-female wage differentials while Oaxaca (1973) examined just male-female wage differentials.[2] Following these works, a number of studies have focused on explaining the existence of both wage and employment differentials within the context of labour market discrimination (Blau and Kahn, 1992). Such interest grew out of the availability of new data in the 1970s and 1980s as well as increased recognition of discrimination as a topic of study among economists (Ashenfelter and Oaxaca, 1987).

These range of models and empirical studies have entailed a diversity of approaches to measuring racism and discrimination including statistical analysis of observational data (decomposition approach; direct experiment; and attitudinal and behavioural indicators (self-report experience of discrimination)).[3] After a brief review of these measurement approaches, this paper focuses on the attitudinal and behavioural indicators approach as an under-utilised and largely unrecognised method of understanding and estimating racism and discrimination in economic literature.

The Blinder-Oaxaca decomposition model holds that racial/gender wage differentials do not necessarily occur solely due to discrimination. Oaxaca (1973) and Blinder (1973) developed their models to decompose wage differentials into their constituent parts. They suggest that some of the differential is due to human capital factors while some is due to discrimination. They show this with regression models that include several explanatory variables (such as age, education, occupation, union membership, experience, among others) for the groups under investigation (white-black/ male-female). Then they apply the models to decompose the results into those attributable to: 1) endowments vs. coefficients (Blinder); 2) personal characteristics vs. discrimination (Oaxaca). The statistic of interest in the Blinder-Oaxaca models is the mean log wages of the groups. Freeman (1980) extended the model by estimating the differences in distribution of wages and changes in the distribution of wages. More recent studies have further refined and extended the model by: further decomposing the wage differential into 'costs' to the disadvantaged and 'benefits' to the favoured (Cotton, 1988); testing the sensitivity of the decomposition estimates to different parameters (Fairlie, 1999, 2005); and applying it to non-linear models (Bauer and Sinning, 2008).

A major concern with the decomposition method is the difficulty in determining how much of the unexplained residual component can be attributed to discrimination even if several confounders are controlled for (i.e., the omitted variables problem). This is further aggravated when only two groups are being compared. For example, important distributional factors may be missed when comparing only blacks and whites when there are other groups in the population. As in many ordinary least squares (OLS) approaches, decomposition models also face the challenge that correlation may not imply causation (Fortin, Lemieux and Firpo, 2010). Antecol, Cobb-Clark and Helland (2011) summarise the weaknesses of the decomposition model as follows:

> Statistical measures of labor market discrimination are generally derived as the residual difference in aggregate group outcomes which remain once observable productivity-related characteristics have been

[2] Oaxaca (1973) states that his analysis could be applicable to white-black wage differential too.
[3] For a detailed review of the literature on the measurement of discrimination see Blank, Dabady and Constance (2004).

> taken into account. It is well known, however, that omitted variables, unobserved heterogeneity, measurement error, feedback effects and pre-labor market discrimination can all confound residual-based estimates of labor market discrimination. (p. 3, footnote 3)

The second approach is the direct experiment method which is based on field experiments through audits; over the telephone; or via correspondence (Bertrand and Mullainathan 2003; and Booth, Leigh and Varganova, 2010; and Riach and Rich, 1991, 2002). In audit methods, actors are matched for socioeconomic and human capital characteristics such as age, education, experience, skill, residential region etc. before approaching employers to apply for jobs. This approach can be in-person, over the telephone (e.g. with distinct accents) in response to advertisements or through comparable resumes mailed out with different names which proxy minority status. Across these approaches, only the variable of interest (i.e., race, ethnicity, gender, sexual orientation, disability etc.) should vary with employer responses then analysed for any differential. The audit method has been used to detect racial discrimination since as early as 1966 (Riach and Rich, 2002). According to a review by Riach and Rich (2002), over 100 experimental studies of discrimination in the housing and labour markets have demonstrated statistically significant discrimination based on race, gender, sexual orientation, or obesity. The validity of such studies depends on the ability of the researcher to control for the characteristics of the actors.

The strength of this method lies in its ability to make 'direct comparison of hiring outcomes' (Kenney and Wissoker, 1994) and to control for several confounding factors such as physical attractiveness, age, obesity among others (Booth, Leigh and Varganova, 2010). On the contrary, the downside is that observational data based on audit studies may not accurately portray reality (Heckman, 1998). According to Heckman, it is impossible to control for all confounders in that what is observable to the employer may be unobservable to the auditor. Thus, it is difficult to demonstrate that the matched persons in the study are identical in everything except their race/gender (Riach and Rich, 1992). Although the correspondence method can overcomes this issue (Bertrand and Mullainathan, 2004) it can only detect discrimination occurring at the initial stage of recruitment. While experiments with anonymous job application procedures have demonstrated discrimination at the recruitment stage (Aslund and Skans, 2008; and Krause, Rinne and Zimmermann, 2011), such discrimination can also occur at later stages of employment, including the tenure and promotion stages (Baldi and McBrier, 1997; Day and McDonald, 2010; Hudson, 2007; Piore, 2008; and Waldman, 2007). Moreover, holding all other factors except race/gender in audit approaches may lead to unrealistic exaggeration of the race/gender effect (Heckman, 1998). Employers face more complex situations in everyday life. Audit studies also provide no information on the perceptions of those targeted by discrimination or on the motivation of those perpetrating discrimination.

Finally, the third method of measuring racial/gender discrimination is the attitudinal and behavioural indicators approach, more commonly known as the self-report survey method. Unlike the other three approaches, this method focuses on the target of discrimination rather than the perpetrator. As discussed above, statistical

and audit methods have been widely used in labour market discrimination research. But, equally important in labour market outcome is self-reported experience of discrimination as it reflects the labour supply aspect of the market. There is evidence that perceived discrimination is strongly linked to labour supply (Antecol, Cobb-Clark and Helland, 2011; Goldsmith *et al*., 2004; and Kuhn, 1990), where discriminated workers decide to quit or cut back their labour supply (Johnson and Neumark, 1996; Neumark and McLennan 1995; and Ozer and Gunluk, 2010). In addition, a wide body of research in social science has shown that there is strong evidence that even subtle forms of discrimination have workplace related and other impacts (Deitch *et al*., 2003; Goldman, Gutek and Stein, 2006; Laer and Janssens, 2011; and Salvatore and Shelton 2007). Research also shows that perceived discrimination is strongly linked with depression, stress and other health risks (Paradies, 2006; Pascoe and Richman, 2009; and Williams and Mohammed, 2009). Thus, above and beyond other approaches, survey data based on self-reports may assist in understanding perceptions and experiences of discrimination as well as their economic implications.

Self-reported discrimination, behavioural consequences and labour market outcomes

Since Herbert A. Simon (1955) proposed his behavioural model as an alternative to the rational choice theory in economics, researchers have been applying methods from psychology to investigate economic phenomena (Kahneman, 2003; and McFadden, 1999). Traditionally, economics (especially neoclassical economics) assumed that people are rational and behavioural aspects such as tastes and preferences are unchanging and exogenous to the economic model and hence not concerns to the economist, at least in the short run (Friedman, 1962; and Stigler and Becker, 1977). However, experimental studies by institutional as well as behavioural economists have proven that tastes and preferences have a profound influence on economic decisions (see for example, Camerer and Thaler, 1995; Caporael *et al*., 1989; Dawes, 1991; Dawes *et al*., 1986; Fehr and Gachter, 1998; and O'Hara and Stagl, 2002). Research from sociology and psychology also demonstrates that phenomena such as discrimination have feedback effects on behaviour both in the present and the future (Corcoran and Duncan, 1979; England and Lewin, 1989; Feagin and Feagin, 1978; and Kohn and Schooler, 1983). 'Discrimination may affect the habits and tastes of current employees,' both in terms of motivation, self-efficacy/esteem among others which could in turn affect productivity (England and Lewin, 1989).

Behavioural economists have developed different models which incorporate non-pecuniary factors affecting behaviours such as happiness (Easterlin, 1995), trust (Bhattacharya, Devinney and Pillutla, 1998), emotions (Loewenstein, 2000), positive affect (Hermalin and Isen, 2008), personality (Groves, 2005), and self-esteem (Goldsmith, Veum and Darity, 1997) among others. Drawing from self-report data, some labour economists have shown that important lessons could be learned by introducing psychological factors into labour market models and applying methods from psychology (Goldsmith, Veum and Darity, 1997; and Goldsmith *et al*., 2004). Goldsmith *et al*. (2004), for example, show how to solve the measurement problem associated with bias in self-report data in their analysis of the role of 'psychological capital' and 'cognitive

dissonance' on labour market outcomes (e.g. labour supply). Smith (2002) and Dixon and Van Horn (2002) use self-report survey data to estimate racial discrimination in the workplace, and offer methodological suggestions to handle validity issues.

However, despite the contribution it can offer to our knowledge of labour market discrimination and its widespread investigation by other social scientists, little use has been made of self-reported discrimination in labour economics to date. This may, in part, be due to concerns about the validity of self-report survey data (Bertrand and Mullainathan, 2001; Goldfarb, 1998; and Wilson and Zietz, 2004). Bias in responses to issues such as health status, disability, discrimination and performance are associated with reduced accuracy of self-report data (Bound, Brown and Mathiowetz, 2001), with minorities alleged to inflate experiences of discrimination. However, research indicates that minorities are more likely to underreport their experiences of discrimination both at personal (Kaiser and Major, 2006 and Krieger *et al*., 2010; and Krieger *et al*., 2011) and social (Dunn and Nelson, 2011) levels. Krieger *et al*., (2011), for example, have demonstrated that black respondents explicitly underreport their experiences of discrimination, while their result was relatively higher in implicit tests and adjusted social desirability. This under-reporting is linked with the difficulty associated in attribution of an experience to racism (Kaiser, and Miller, 2001) and the personal pain involved (Bobo and Suh, 2000; and Schmitt, 2002) as well as potential negative social repercussions which could be involved in labelling experiences as racism (Kaiser and Major, 2006).

Perhaps due to unfounded concerns about validity, methods of measurement developed so far have not attempted to address the economic significance of discrimination from the target's perspective (D'Amico, 1987; England and Lewin, 1989; and Moss and Huang, 2009). Economists have been mainly concerned with 'unexplained' differential in earnings or employment (Ashenfelter and Oaxaca, 1987). This analysis ignores the supply-side implications of discrimination which could be more revealing in understanding the economics of discrimination (D'Amico, 1987). A more realistic inference regarding the phenomenon of labour market discrimination could be drawn from the search theory literature which was first proposed by Stigler (1961) and later developed by McCall (1970).

Search theory holds that information is vital in labour market outcomes which in turn depend on participation in job search as well as the intensity of job search (Addison and Portugal, 2001; Blau and Robins, 1990; Holzer, 1986a; McCall, 1970; Mortensen, 1986; Shimer, 2004; and van Ham, Mulder and Hooimeijer, 2001). An individual's job search participation and search intensity are influenced by the expected return from employment as well as the probability of success in the job market (Ashforth and Saks, 2002; Holzer, 1986a; and Shimer, 2004). Not only do minority group workers quit participation in job market and active job search, they also reduce their investment in human capital because their expected return is low and it is costly to do so (Black, 1995; and Becker, 1957, 1985).[4]

[4] The caveat with this is that minorities have lower returns to education means they have also lower opportunity cost of going to college. They have lower wage once employed also means that they have lower cost of job search. Hence Becker (1957) argues that the impact of discrimination on the decision to invest in education (and by implication, to active job search) is ambiguous (Black, 1995).

In a search theoretic framework, Black (1995) shows that monopolistic power results in economic discrimination against minorities when it is costly for these workers to search for a job and when employers have monopolistic power to a certain degree. Further, Black (1995) argues that since discrimination tends to alter the gains from active search, it is evident then that the neoclassical estimation of gender and wage differential understates the loss of utility due to discrimination. Hence, this analysis led Black to conclude that 'economic discrimination may be more prevalent and may inflict greater welfare loss' (p. 312), than that predicted by neoclassical models. In view of this, discouraged workers unwillingly quit active search rather than risk unemployment, thus, it is easy to see how traditional demand-side models of discrimination fail to account for this phenomenon.

In addition, Van Ham, Mulder and Hooimeijer (2001) have shown that discouragement affects workers at two stages: 1) when they make decision to participate in the labour force and 2) when they decide as to whether they should actively engage in job search. Braddock II and McPartland (1987) similarly argue that minorities in the U.S. face four barriers at three different stages in job markets, i.e., they face 'segregated networks' at the candidate stage, 'information bias' and 'statistical discrimination' at the entry stage, and 'closed internal markets' at the promotion stage' (p. 5).[5] The traditional demand/supply analysis of job markets considers only the second stage. Yet, the first stage of labour market decision is important in that it gives more accurate picture of discrimination by showing some section of potential workers excluded from the labour market due to discrimination. Thus, assessing labour market decisions of employers using only observational data gives an incomplete picture of discrimination due to selection bias in favour of those who already decided to participate in job search. This problem could be solved using self-report data that takes into account groups who have quit due to discouragement. The result is a more accurate approximation of the labour market effects of discrimination.

2. Methods

Either the incidence or prevalence approaches can be used in measuring discrimination. Whereas the former measures the occurrence of new discrimination episodes in a given period (e.g. a year), the latter measures the occurrence of the experience up to a certain point of time. Using the prevalence approach has the advantage of considering previous exposures to discrimination. By employing a prevalence method we measure the extent of racial discrimination that may hinder minority workers from successfully competing in the labour market. As our main purpose is to investigate the utility of self-report data in measuring racial discrimination, we assess discrimination in the labour market using self-reported experiences of discrimination from survey data. To our knowledge, this study is unique in its integration of self-report data with the prevalence approach to measuring racial discrimination in the labour market. Previously, Goldsmith *et al*. (2004) have used self-report data in estimating labour supply consequences of perceived discrimination. Their method is based on the

[5] Braddock II and McPartland (1987) also highlight the role that segregated social networks contribute to aggravate the entry barrier at the candidate stage, especially, for those individuals with low level of education who rely on 'word of mouth' information to find job.

neoclassical labour supply model and their aim was to examine the supply curve when a person experiences discrimination. Johnson and Newmark (1996) have also used longitudinal self-report data to measure age discrimination. They focus on job-separation within five-year time-period with their specification relying on comparison of reports at different times rather than social desirability scores, to validate their method. Our purpose, however, is to measure the relative exposure of minorities to racial discrimination at different stages in the labour market with social desirability bias as a control measure. We include social desirability in our analysis, as self-reported data can be biased by this phenomenon (Krieger *et al*., 2011). We present below the variables we utilise in our models and their measures.

Description of variables and their measures

Racial category

In this study, we use the race/ancestry categorical variable available in the NSAL dataset as our main variable. In this dataset, respondents are grouped into three racial categories: African Americans, Caribbean Blacks and non-Hispanic Whites. We use this classification in comparing self-reported experience of racial discrimination for the African Americans (category '1') and Caribbean Blacks (category '2') with non-Hispanic Whites (category '3'). The Caribbean Black category is composed of Afro-Caribbean and other Hispanic-Black sub-samples.

Discrimination variables

Respondents were asked twelve prevalence questions regarding their personal experience of discrimination in the labour market. Out of these, the first three questions asked: 'At any time in your life, have you ever been unfairly fired/ not hired/ denied promotion?' For each question, the five response options available are: 'yes', 'no', 'not applicable', 'refused' and 'don't know'. In addition, follow-up questions were asked about the reasons for experiencing discrimination for those who reported discrimination. Respondents were asked: 'What do you think was the main reason for this experience?' for prevalence of discrimination in each setting. For this set of questions, 18 response options are available including 'ethnicity', 'race', 'gender', 'age' 'refused', 'don't know' and 'other'. We utilise both sets of question in constructing three dichotomous variables, *Hiring Discrimination, Unfair Firing from Job* and *Unfair Denial of Promotion* where each variable takes '1' if the respondent has indicated an experience of discrimination and the reason for that particular experience is nominated to be 'race' or '0' otherwise. The number of missing values for each of the prevalence variable is 56 (0.9 per cent). All respondents who mentioned having experienced discrimination provided the reason of that discrimination experience, were not sure or refused to give an answer, with no missing values recorded. We estimate logistic regression models for the three dichotomous variables of labour market discrimination. Although our main purpose is to investigate 'race' as a reason of discrimination, we include the first four 'reasons for experiencing discrimination' for comparison in our descriptive analysis. We collapse the rest into an 'other' category. In addition, we investigate the propensity of each group to be in a position to experience hiring/firing/promotion discrimination by limiting the sample size to 'those who applied for job'.

Demographic and human capital variables

We create mutually exclusive categories from the age distribution of NSAL respondents', grouping them into five categories, i.e., 18-29 years, 30-44 years, 45-59 years, and 60 years or above. Using these five categories, we compare the last four groups with the 18-29 year olds. Excluding 'refused' and 'don't' know,' there are three categories for the marital status variable in NSAL: 'married/cohabiting' which we simply refer as 'married', 'divorced/separated/widowed' referred to as 'divorced' and 'never married' referred to as 'unmarried'. Education, household income and employment status have also been included as control variables. In the NSAL dataset, the household annual income range is zero to USD 200,000 which in our analysis we divide into quartiles. We divide education into four categories: 'less than 12 years', '12 years', '13-15 years' and '16 years and above'. For employment status responses are classified into 'employed' 'unemployed' and 'not in labour force' with 14 missing values (0.2 per cent). We also analyse discrimination in relation to employment by including average number of hours worked per week. The range of responses for this variable is 1-97 hours which we classify into four categories (i.e., 'less than 20 hours', '21 to 40 hours', '41 to 60 hours' and 'more than 60 hours'). We also include a variable that asked respondents as to whether they grew up speaking any language other than English. Response options are 'yes' or 'no' with 1 per cent missing values recorded. Other correlates included in this study are: household size, with seven categories, a minimum of '1' and maximum of '7 or more'; country of birth categorised into U.S.-born and foreign-born; region in U.S., with four categories; occupation divided into 10 categories; religiosity, whether religion is important in the respondent's life, with four categories ('very important' to 'not important at all'); respondent's general satisfaction with life with four category response option, ranging from 'very satisfied' to 'very dissatisfied'; respondent's height with continuous scale of measurement; and whether the respondent sees race as hindrance to personal success, with 'yes' or 'no' option.

Social desirability

An important variable in our analysis is the social desirability variable. According to Crowne and Marlowe (1960), social desirability bias occurs when individuals respond to questions with 'behaviors, which are culturally sanctioned and approved but which are improbable of occurrence' (p. 350). Such bias leads to the under-reporting of behaviours that are not socially desirable and over-reporting of those that are socially approved. The result is the confounding of relationships among different variables that are under investigation. It is possible to control for these effects by including social desirability scores in regression models. Psychologists such as Crowne and Marlowe (1960) have used a 33-item questionnaire with a 'true' or 'false' response options to rate the social desirability score of respondents. For example, in Crowne and Marlowe's scale, respondents are required to answer 'true' or 'false' to 33 statements such as: 'I never hesitate to go out of my way to help someone in trouble'; 'It is sometimes hard for me to go on with my work if I am not encouraged'; 'I sometimes feel resentful when I don't get my way'. Then the responses are added to a total score. Scores 0-8 indicate low in social desirability where respondents behave closer to reality; 9-19 indicate average in social desirability where respondents are balancing their behaviour

and reality; and 20-33 indicate high in social desirability where respondents want to be seen as well behaved, or they highly regard the approval of others. Other researchers (Zuckerman and Link, 1968; and Loranger, 1994) have also developed similar scales in measuring social desirability. The 10-item Zuckerman Social Desirability and the 34-item International Personality Disorder Examination (IPDE) were used in generating social desirability and personality scores in the NSAL dataset. Both scales have 'true' or 'false' response options. Statements in the Zuckerman scale are of the type: 'I have never met a person I didn't like', 'I have always told the truth' etc. Whereas in the IPDE, statements such as 'I show my feelings for everyone to see', 'When under stress, things around don't seem real' are included. We utilise these two scales jointly in our analysis to measure social desirability for each observation, with scores ranging from zero to 44, where large value is interpreted as more social desirability bias. In examining social desirability bias, we first treat the scores as a discrete variable. To further investigate any difference between ranges of scores, we create four categories with the ranges 0-10, 11-20, 21-30 and 31-44.

3. Data

This paper draws from the National Survey of American Life (NSAL), a probabilistic survey of three groups of Americans: African American, Caribbean Blacks and Non-Hispanic Whites. This survey was conducted between February 2001 and June 2003 as an initiative of the National Institute of Mental Health Collaborative Psychiatric Epidemiology Survey. NSAL is part of the Collaborative Psychiatric Epidemiologic Surveys (CPES) which consists of the National Comorbidity Survey Replication (NCS-R), the National Latino and Asian American Study (NLAAS) and NSAL itself. NSAL has comprehensive questions on issues as diverse as mental and physical health status, depression, disorders, work-related stress, discrimination, and socio-economic and demographic issues, social desirability and personality among others. It is an ideal survey to explore racial and other forms of discrimination within the American society. In the aggregate CPES data, a subset of which is the NSAL sample, large number of missing values are reported. However, the reasons for the existence of missing values in CPES vary. One reason is that a number of questions asked of NSAL respondents were not asked of others (NCS-R and NLAAS respondents). For example some questions regarding discrimination were asked only of NSAL respondents, hence our focus on this sample. The missing values for the discrimination variables in this sample (NSAL) are therefore few. They become large only when NSAL and the other two sub-samples are consolidated. Missing values are therefore not major issue in our analysis. With regards to NSAL respondents, the sampling issue with the non-Hispanic whites is accounted for by inclusion of the weight variables.

The sampling design of the NSAL datasets involved complex probability sampling procedure with multi-stage area probability samples. A nationally representative African American sub-sample makes the core NSAL sample, consisting of households across 48 states. African Americans are identified as those black respondents having no ancestral ties with West Indies or the Caribbean. The Caribbean black sub-sample consisted of two group, one sampled from the NSAL core areas (n=265) and the rest (n=1365) is a supplemental sample. Selection of the latter involved stratified sampling

of residents in areas where Caribbean blacks have more than 10 per cent concentration. The third sub-sample, non-Hispanic white, which is a stratified, disproportionate sample of the non-Hispanic white population, represented 14 per cent of U.S. white population (Alegria, *et al*., 2008) and these whites consist of those residing in areas where the African American population is more than 10 per cent. The survey excluded institutionalised individuals (e.g. those in jail, nursing homes etc.) and was restricted to English speaking respondents. Computer assisted telephone survey method was used to collect data. After a screening of eligible housing units, 6,199 respondents were recruited and completed the interview (approximately 145 minutes long and contact per interview of 7.4). The valid final sample size is n=6,082, of which 3,750 are African Americans, 1,621 are Caribbean blacks and 891 are non-Hispanic Whites aged 18 years and above. Response rates are 70.7, 77.7 and 69.7 per cent for African Americans, Caribbean blacks and non-Hispanic whites respectively, for the overall NSAL sample the response rate is 71.5 per cent. For more detailed description of the sampling design, data collection and weighting procedure of the NSAL data, we refer the reader to Alegria, *et al*. (2008), Jackson, *et al*. (2004) and Jackson, *et al*. (2007).

4. Empirical strategy

Following Williams *et al*. (2007) and others, we use the classification in the NSAL sample (i.e., African American, Caribbean black, and non-Hispanic white) and estimate descriptive statistics comparing their socio-economic characteristics. In the NSAL sample, the African American sample is nationally representative. The non-Hispanic white sample is also smaller relative to the African Americans and Caribbean, and the sample for African Americans is less clustered than that of the Caribbean blacks. To correct these sampling errors, the use of weights and cluster/strata in estimating descriptive statistics for survey data with complex sampling design, is recommended (Cameron and Trivedi, 2009; and Winship and Radbill, 1994). We follow this approach in our analysis. The estimates based on these datasets and the standard errors associated have to be computed using measures that account for the complex design. In order to account for the sample design, the CPES datasets of which the NSAL is a part has case-specific population weights. The NSAL population weights were generated through a series of stages such as assigning race/ancestry category to each case; assigning area segment to each geographic domain; assigning respondents to each geographic domain. Final weights were then centred to the sample size and normalised to mean value of 1, and then restored and rescaled back to the U.S. population according to the March 2002 Current Population Survey (CPS) (see Heeringa and Berglund, 2007). In addition, the weight variables include clusters and strata since stratified sampling is involved in selecting the Afro-Caribbean sample. The NSAL data has two weight vectors: population weight and weight centred to sample sizes which provide equivalent results. In this study we use population weight along with the stratum and cluster vectors to utilise the Stata feature for survey data analysis. The syntax 'Svyset' is a Stata set up which makes use of weights, strata and clusters to estimate statistics and estimates corrected for complex sampling design. The outcomes from these survey analyses are more efficient than cross-tabulations and regression models of survey data with complex design. We use Stata version 12.1 to estimate our models. First, weighted descriptive

statistics are estimated using the population weights. The weighting here compensates for the stratification and clustering of the Afro-Caribbean and non-Hispanic whites hence adjusting the frequencies and percentages obtained. Then we estimate a series of regression models using population weights in assessing the prevalence of racial discrimination. Since the population weights are computed to correspond to the U.S. population (particularly the CPS), they allow us to make inference from our estimated models to the general population.

In examining the prevalence of racial discrimination in the labour market for racial minorities utilising the NSAL self-report data, we estimate three logistic regression models. We use logistic regression as we have dichotomous dependent variable with respondents either experiencing discrimination or otherwise. This variable, y_i, takes 1 if a respondent reported having experienced discrimination in the workplace and 0 otherwise. To estimate the probability of reporting discrimination, i.e., $P(y_i = 1)$, the logistic regression model we specified is:

$$Logit\left[P(y_i = 1)\right] = log\left[\frac{P(y_i = 1)}{1 - P(y_i = 1)}\right]$$

$$log\left[\frac{P(y_i = 1)}{1 - P(y_i = 1)}\right] = \beta_0 + \beta_1 r + \beta_i x_i + u_i \quad (1)$$

where the proportion $\left[P(y_i = 1)/(1 - P(y_i = 1))\right]$, indicates the odds of discrimination being reported. It shows how likely respondents in the NSAL sample are to report experience of discrimination. For example, if the probability $P(y_i = 1) = 0.60$, then the odds are 0.60/0.40 or 1.5. In our case, this means the respondent is 1.5 times more likely to report experience of discrimination than otherwise.[6] If the probability of success (outcome of interest) equals 0.5, then the odds equals 1, indicating no association between the dependent and independent variables. By default, results obtained with Software such as Stata are reported as logs of the odds ratio. To simplify interpretation of log odds results from estimations such as equation (1) researchers exponentiate coefficient estimates to eliminate the log from the estimates. Thus, model (1) can be equivalently written as:

$$P\left[y_i = 1\right] = \frac{exp\left(\beta_0 + \beta_1 r + \beta_i x_i + u_i\right)}{1 + exp\left(\beta_0 + \beta_1 r + \beta_i x_i + u_i\right)}. \quad (2)$$

The covariate *r* in equation (2) represents the respondent's race, which is a categorical variable with three categories in our model; x_i represents other covariates we include in our three set of models; and u_i is the error term which has logistic distribution. Our results are reported as odds ratios indicating that controlling for the demographic, human capital and psycho-social covariates, the designated racial group (African Americans/Caribbean black) are more/less likely to report having experienced firing/hiring/promotion related discrimination in the labour market compared to the reference group (non-Hispanic whites).

[6] Logistic regression models are estimated using the maximum likelihood estimation method. For detailed discussion of the logistic regression models for categorical variables we refer the reader to Agresti (2007).

Since our purpose is to explore racial discrimination at different stages of employment, we run three logistic regressions: at the point of entry (hiring discrimination), leading up to termination (job tenure discrimination) and in the internal labour market (discrimination in promotion). In these models, we control for the standard human capital and socio-demographic variables (including, gender, age, marital status, number of biological children, education, household income, geographic region and employment status among others). We also re-estimate the models controlling for more possible confounders available in the NSAL datasets. Our final models include social desirability scores to control for reporting bias.

5. Results

Descriptive statistics of the participants in the NSAL survey will not be discussed here, but are reported in tables 1 and 2.

As detailed in table 2, substantial proportion of African Americans (65.6 per cent) and Caribbean blacks (61.2 per cent) report experience of racial discrimination while non-Hispanic whites have the highest report of age discrimination experience (14.2 per cent). This pattern is repeated when the experience of labour market discrimination is disaggregated into experience of hiring discrimination, being unfairly fired and unfairly denied promotion. However, the reports by non-Hispanic whites of discrimination experience because of one's race, gender and age tend to increase with respect to hiring and promotion.

Table 3 presents the results of three weighted logistic regression models of racial discrimination. Model 1, reported in column 1, examines self-reported experiences of hiring discrimination in the labour market controlling for several individual characteristics. Out of a sample size of 6,068 respondents in NSAL, we find an odds ratio of 6.59 (95 per cent CI: 3.32-13.11) for African Americans compared to their non-Hispanic white counterparts, to self–report experience of racial discrimination at entry into the labour market. The result is larger for Caribbean blacks compared to whites with an odds ratio of 9.85 (95 per cent CI: 4.73-20.50). This result is also statistically significant at the one per cent level and confirms other findings of racial discrimination based on observational data (Bertrand and Mullainathan, 2004; and see Darity and Mason, 1998). From the model, it appears that Caribbean blacks have the highest likelihood to report racial discrimination than African Americans compared to non-Hispanic whites. In this model, age appears to have no effect on the reported outcome of racial discrimination except for the 41 to 60 age category who have an odds ratio of 1.6 (95 per cent CI: 1.07-2.38). This result is in line with the theory of age discrimination as middle-aged employees are more likely to face tighter labour market given a number of factors including approaching retirement age (Johnson and Newmark, 1996).

Gender is also one of the variables that have predictive power in the hiring discrimination model. Males in the NSAL survey are more likely to report hiring discrimination compared to females with an odds ratio of 2.16 (95 per cent CI: 1.66-2.80). Education, income categories (also using an alternative, log income), and household size seem to have no effect on the self-report of racial discrimination in our model. Marital status, however, has mixed effect; although divorced and unmarried respondents have an increased likelihood of reporting discrimination, this result is

Table 1 - Weighted descriptive statistics comparing the racial distribution of socio-economic characteristics in the National Survey of American Life

Parameters	*African American*		*Caribbean Black*		*Non-Hispanic White*		*F-Statistic*	*Total*
Sample size	n=3570	Weighted %	n=1621	Weighted %	n=891	Weighted %		n=6,082
Socio-demographics								
Sex							2.4	
Male	1,271	44.2	643	49.5	372	47.3		2,286
Female	2,299	55.9	978	50.5	519	52.7		3,796
Age (mean, SE)	42.3 (0.47)		39.5 (1.13)		45.2 (1.12)		1.8	
18-29	806	24.5	436	31.9	150	20.3		1,392
30-44	1276	35.1	605	35.4	265	33.3		2,146
45-59	855	23.9	356	18.6	249	25.5		1,460
>=60	633	16.4	224	14.1	227	20.9		1,084
Marital Status							9.2***	
Married	1,222	41.7	693	47.7	429	54.2		2,344
Divorced	1,164	26.7	385	19.0	287	23.9		1,836
Never Married	1,176	31.5	543	33.4	173	21.9		1,892
No. of Biological Children							9.5***	
0	363	13.0	128	11.0	57	9.6		548
1	705	25.1	358	27.9	148	26.4		1,211
2-3	1,378	48.4	561	48.4	364	58.1		2,303
>= 4	394	13.5	160	12.6	43	5.9		597
Human Capital Characteristics								
Years of Schooling								
Less than 11	920	24.4	306	21.2	149	14.7	8.4***	1,375
12 Years	1,362	38.0	481	32.2	293	30.8		2,136
13-15 Years	809	23.5	443	26.0	216	24.8		1,468
More than 16 Years	479	14.1	391	20.6	233	29.7		1,103
Childhood Spoken Language							2.38	
English	2,975	84.68	1,002	62.49	758	84.52		4,735
Non English	553	15.20	605	37.51	126	15.48		1,284

Table 1 - Weighted descriptive statistics comparing the racial distribution of socio-economic characteristics in the National Survey of American Life (continued)

Parameters	*African American*		*Caribbean Black*		*Non-Hispanic White*		*F-Statistic*	*Total*
Sample size	n=3570	Weighted %	n=1621	Weighted %	n=891	Weighted %		n=6,082
Labour Market Characteristics								
Work Status							13.8**	
Employed	2,334	66.8	1,183	73.3	598	72.9		4,115
Unemployed	366	10.2	158	11.0	39	4.2		563
Not in Labour Force	861	23.0	279	15.7	250	22.9		1,390
Hours Worked, if Employed	39.4/0.36/2,308		39.3/0.50/1,17		38.9/0.7/59			
(mean/SE/n)			2		1		12.4***	
Less than 20 Hours	218	9.2	96	7.0	81	13.8		395
21-40 Hours	1,491	63.9	772	68.7	302	48.9		2,565
41-60 Hours	521	22.9	261	21.5	191	35.2		973
More than 60 Hours	78	4.0	43	2.8	17	2.1		138
Income & Geographic Location								
Annual Household Income							8.3***	
Less than 18,000	1,315	30.7	368	22.0	212	19.5		1,895
18,000-31,999	930	25.3	436	27.5	207	21.6		1,573
32,000-54,999	781	23.8	391	21.3	228	26.2		1,400
More than 55,000	544	20.2	426	29.2	244	32.7		1,214
Birthplace							10.5**	
Born in U.S.	3,464	97.6	440	37.1	855	95.7		4,759
Born Outside U.S.	64	2.3	1,166	62.9	29	4.3		1,259
Region							15.1***	
Northeast	411	15.7	1,135	58.5	107	24.3		1,653
Midwest	595	18.8	12	3.8	83	7.6		690
South	2,330	57.1	456	29.4	609	53.2		3,395
West	234	8.5	18	8.4	92	14.8		344

Source: Calculated from the 2001-2003 NSAL datasets replicating Williams *et al*., 2007.
Significance levels: * <0.1 ** <0.05 *** < 0.01.
Note: The descriptive statistics, percentages, F-stat and p-values are based on weighted estimation.

Table 2 - Weighted descriptive statistics comparing self-reported discrimination in the National Survey of American Life

Parameters	*African American*		*Caribbean Black*		*Non-Hispanic White*		*F-Statistic*	*Total*
Sample size	n=3570	Weighted %	n=1621	Weighted %	n=891	Weighted %		n=6,082
Prevalence of Discrimination in Labour Market (Reason)							111.7***	
Ancestry/Ethnicity	57	2.1	42	2.9	15	9.6		114
Gender	111	3.6	32	3.0	75	5.0		218
Race	1,739	65.6	744	61.2	30	13.3		2,513
Age	93	3.9	44	3.7	67	4.3		204
Height/Weight	35	1.4	10	1.0	37	14.2		82
Skin Colour	177	7.1	125	11.1	6	7.1		308
Other	330	12.1	160	14.7	257	0.6		747
Non Response or Missing	121	4.3	57	2.5	54	45.8		232
Reported Experience of Hiring Discrimination (n=6,026)	736	21.4	334	23.3	129	15.7	2.6*	1,199
Racial	433	59.2	197	62.2	18	14.9		648
Ethnicity	30	3.8	16	3.0	2	2.6		48
Gender	23	2.9	10	4.8	20	10.8		53
Age	45	6.5	14	2.3	16	8.2		75
Other	192	25.65	92	27.34	71	61.68		355
Non Response or Missing	13	1.87	5	0.40	2	1.84		20
Reported Experience of being Unfairly Fired (n=6,026)	806	24.6	335	26.3	207	26.2	51.8***	1,348
Racial	328	40.2	129	44.20	11	3.06		468
Ethnicity	12	1.4	15	3.68	2	0.67		29
Gender	59	8.1	15	2.02	20	8.36		94
Age	37	4.5	11	1.71	16	8.17		64
Other	352	43.2	152	44.98	149	68.98		653
Non Response or Missing	18	2.63	13	3.42	9	10.76		40

Table 2 - Weighted descriptive statistics comparing self-reported discrimination in the National Survey of American Life (continued)

Parameters	*African American*		*Caribbean Black*		*Non-Hispanic White*		*F-Statistic*	*Total*
Sample size	n=3570	Weighted %	n=1621	Weighted %	n=891	Weighted %		n=6,082
Reported Being Unfairly Denied Promotion (n=6,026)	668	20.4	280	16.3	114	11.4	13.6***	1,062
Racial	367	55.69	134	49.68	18	16.62		519
Ethnicity	21	3.40	14	3.08	0	0		35
Gender	48	6.48	22	4.99	22	14.83		92
Age	35	5.12	14	5.28	13	10.7		62
Other	185	27.66	86	31.99	57	53.62		328
Non Response or Missing	12	1.64	10	4.97	4	4.24		26

Source: Calculated from the 2001-2003 NSAL datasets.
Significance levels: * <0.1 ** <0.05 *** < 0.01.
Note: The descriptive statistics, percentages, F-stat and p-values are based on weighted estimation.

Table 3 - Odds-ratio from weighted logistic regression models: self-reported racial discrimination in the labour market

	Model 1 Hiring Discrimination		*Model 2 Unfair Firing from Job*		*Model 3 Unfair Denial of Promotion*	
Parameters	*Odds ratio*	*95% CI*	*Odds ratio*	*95% CI*	*Odds ratio*	*95% CI*
Race (ref: non-Hispanic Whites)						
African American	6.59 ***	(3.32 - 13.11)	14.11 ***	(6.03 - 33.03)	7.28 ***	(4.56 - 11.63)
Caribbean Black	9.85 ***	(4.73 - 20.50)	32.69 ***	(11.93 - 89.54)	6.21 ***	(3.34 - 11.56)
Age (ref: 18-29 years)						
21-40	1.34	(0.92 - 2.00)	1.34	(0.93 - 1.92)	2.09 ***	(1.27 - 3.45)
41-60	1.61 **	(1.08 - 2.39)	1.98 ***	(1.24 - 3.16)	3.19 ***	(1.71 - 5.96)
>60	1.39	(0.85 - 2.26)	0.71	(0.39 - 1.30)	2.88 **	(1.28 - 6.52)
Gender (ref: Female)	2.16 ***	(1.66 - 2.80)	1.74 ***	(1.30 - 2.34)	2.07 ***	(1.46 - 2.92)
Marital Status (ref: Married)						
Divorced	1.40 **	(1.01 - 1.94)	1.25	(0.86 - 1.80)	1.04	(0.70 - 1.55)
Unmarried	1.11	(0.76 - 1.62)	0.99	(0.71 - 1.38)	0.59 **	(0.35 - 0.98)
Employment Status (ref: Employed)						
Unemployed	1.04	(0.64 - 1.68)	1.02	(0.63 - 1.66)		
Not in Labour Force	0.72 *	(0.51 - 1.03)	0.88	(0.61 - 1.25)		
Years of Schooling (ref: Less than 12 Years)						
12 Years	0.78	(0.55 - 1.09)	0.86	(0.61 - 1.23)	1.25	(0.79 - 1.97)
13-15 Years	1.05	(0.69 - 1.61)	0.92	(0.64 - 1.32)	1.58 **	(1.02 - 2.44)
16 Years or Above	1.49	(0.83 - 2.68)	1.1	(0.63 - 1.94)	1.94 *	(0.97 - 3.88)
Household Size	1.03	(0.92 - 1.15)	0.93	(0.85 - 1.02)	1.03	(0.93 - 1.14)
U.S.-born (ref: Foreign-born)	1.57 **	(1.09 - 2.26)	3.76 ***	(1.89 - 7.49)	1.93 ***	(1.19 - 3.15)
Region (ref: Northeast)						
Midwest	1.68 ***	(1.18 - 2.40)	1.13	(0.83 - 1.56)	0.95	(0.45 - 2.03)
South	0.97	(0.69 - 1.37)	0.88	(0.64 - 1.23)	0.87	(0.50 - 1.51)
West	2.18 ***	(1.36 - 3.49)	0.96	(0.63 - 1.48)	0.81	(0.42 - 1.57)
Household Income						
18,000-21,999	1.37	(0.88 - 2.14)	1.21	(0.82 - 1.80)	0.73	(0.43 - 1.24)
32,000-54,999	1.08	(0.69 - 1.70)	0.80	(0.59 - 1.09)	0.83	(0.51 - 1.34)
55,000 or Above	1.25	(0.73 - 2.15)	1.40	(0.88 - 2.23)	0.9	(0.47 - 1.72)

Table 3 - Odds-ratio from weighted logistic regression models: self-reported racial discrimination in the labour market (continued)

	Model 1 Hiring Discrimination		*Model 2 Unfair Firing from Job*		*Model 3 Unfair Denial of Promotion*	
Parameters	*Odds ratio*	*95% CI*	*Odds ratio*	*95% CI*	*Odds ratio*	*95% CI*
Occupation						
Professional (University Degree)	0.79	(0.42 - 1.49)	1.58	(0.67 - 3.72)	0.62	(0.24 - 1.62)
Associate Professional	1.06	(0.59 - 1.92)	1.32	(0.56 - 3.13)	0.68	(0.32 - 1.44)
Office Clerk	1.09	(0.54 - 2.21)	1.62	(0.66 - 3.96)	1.08	(0.44 - 2.64)
Customer Service	0.81	(0.40 - 1.67)	2.02 *	(0.92 - 4.39)	1.14	(0.46 - 2.83)
Personal Service Worker	0.83	(0.44 - 1.56)	1.51	(0.75 - 3.03)	0.54	(0.22 - 1.32)
Trade Worker	1.02	(0.52 - 2.00)	1.83	(0.78 - 4.27)	0.78	(0.34 - 1.83)
Operator	0.67	(0.31 - 1.45)	1.84	(0.75 - 4.51)	0.69	(0.29 - 1.64)
Routine Task Job	1.31	(0.66 - 2.61)	1.99	(0.84 - 4.72)	0.69	(0.32 - 1.48)
Other	0.69	(0.34 - 1.39)	1.88	(0.72 - 4.90)	0.58	(0.18 - 1.87)
Missing	0.91	(0.35 - 2.40)	0.63	(0.17 - 2.29)	0.67	(0.17 - 2.68)
Constant	0.005 ***	(0.001 - 0.02)	0.001 ***	(0.0002 - 0.004)	0.004 ***	(0.001 - 0.01)
No. of Observations	6,068		6,068		4,115	
F-Statistic	12.14		6.057		8.629	
Df	31		31		29	
P-value	< 0.001		< 0.001		< 0.001	

Significance levels: * <0.1 ** <0.05 *** < 0.01.
Note: Model 1 compares the prevalence between racial minorities and non-Hispanic whites of self-reported experience of racial discrimination at the point of entry in the labour market in the United States based on the NSAL survey data. Model 2 compares these groups, in relation to job termination, and Model 3 in relation to promotion. Model 1 and 2 are estimated for the whole sample while Model 3 is restricted to those who are employed.

statistically significant only for those who are divorced. The model also shows that country of birth and region of residence in the U.S. are important in explaining racial discrimination, although the dummy variable South is not statistically significant. U.S.-born respondents are more likely to report racial discrimination than foreign-born ones with an odds ratio of 1.68 (95 per cent CI: 1.18-2.40). Those who live in Midwest and West are also more likely to report racial discrimination than those who live in the Northeast (OR: 1.68, 95 per cent CI: 1.18-2.40 and OR: 2.18, 95 per cent CI: 1.36-3.49 respectively). Finally, in racial discrimination literature, occupation is another important variable that labour economists argue plays a role in explaining racial differential in employment as well as earnings and wages. However, we found no evidence for the relationship between occupation and self-reported experience of racial discrimination in the NSAL datasets.

Column 2 of table 3 presents self-reported experience of being unfairly fired because of the participant's race. Estimating a logistic regression model for the dependent variable 'unfairly fired due to race', we find similar results as in model 1, using the same confounders. The model predicts that African Americans are more likely to self-report being unfairly fired because of their race than non-Hispanic whites (OR 14.11, 95 per cent CI: 6.03-33.03). As in model 1, gender and country of birth are strongly associated with the self-report of racial discrimination. Age has some association with racial discrimination only for those 41 to 60 years of age. Respondents in the middle age category are more likely to report experience of unfair job termination compared to those between 18 and 29 years of age (OR: 1.98, 95 per cent CI: 1.24-3.16). The other variables including marital status, education, income, region of residence, household size, employment status as well as occupation seem to have no association with the racial discrimination self-reports among the three racial groups in NSAL. Results in this model, especially for the Caribbean black sample, however, should be interpreted cautiously as the coefficient has large standard errors (95 per cent CI: 11.93-89.54).

In column 3 of table 3, we focus on those who have reported being currently employed. We restrict the sample size to this group to investigate the experience of racial discrimination in the internal labour market and examine weighted logistic regression models for these observations.[7] A total of n=1,967 observations are dropped from the sample including those who are unemployed (n=563), those who are not in the labour market (n=1,390) and those with missing values for the work status variable (n=14) with 4,115 participants remaining in the model. Our result shows that African American blacks are more likely to report discrimination in the internal labour market than non-Hispanic whites (OR: 7.28, 95 per cent CI: 4.56-11.63) followed by Caribbean blacks (OR: 6.21, 95 per cent CI: 3.34-11.56). The model also shows that age gender and country of birth are strongly related to self-reported racial discrimination in promotion, with increasing age leading to increases in self-reported discrimination. Those 41-60 years of age, however, report more exposure than younger and older sub-samples. Male respondents are more likely to report internal labour market discrimination than females (OR: 2.07, 95 per cent CI: 1.46-2.92). U.S.-born respondents are more

[7] This approach is repeated in succeeding tables. Sample size for Model 3 of each table is restricted to those who are 'currently employed'.

likely to report discrimination in promotion compared to foreign-born respondents (OR: 1.93, 95 per cent CI: 1.19-3.15). Marital status seems to have weak association, with unmarried respondents less likely to report discrimination in promotion than married respondents. Discrimination reporting in promotion also seems to be weakly but positively related to years of schooling. However, household income, region of residence, household size, as well as occupation, have no association with self-reported discrimination in promotion.

To investigate whether the result is confounded by heterogeneity in the exposure to discrimination, we restrict the sample size to those who applied for a job, i.e., those 'at risk' (just nine per cent of the total sample). Although not efficient (because of wide CIs) we estimated unweighted logistic regression models for the restricted sample (i.e. nine per cent of the total sample), with comparable results to what we obtained previously using weighted regression [e.g. for table 1 Model 1: black (OR: 9.43), Caribbean (OR: 17.21); Model 2: black (OR: 2.73), Caribbean (OR: 3.68); with only blacks remaining when the sample is restricted to those who are employed, thus, Model 3 is not feasible with this sample].

To control for the possibility of omitted variables bias in our models, we include more variables that define the characteristics of respondents in NSAL, including whether the respondent is non-English speaker, religious, and his/her overall satisfaction with life, his/her height and whether he/she generally perceives race as hindrance to one's performance. English language ability, depression, country of birth and socio-economic factors have previously been linked with perception of racial disparity and/or racial discrimination (Paradies, 2006; and Pascoe and Richman, 2009). We also included total number of hours worked in examining the variable 'unfair denial of promotion'. The result, reported in table 4, confirms what we reported in table 3 although the odds ratios are slightly smaller (except for Model 3). African Americans and Caribbean blacks are more likely to report experience of discrimination at all stages of the labour market than their non-Hispanic white counterparts. For African Americans, odds ratios are 4.39 (95 per cent CI: 2.12-9.08) for hiring discrimination, 9.20 (95 per cent CI: 3.6-23.51) for unfairly being fired and 8.46 (95 per cent CI: 4.79-14.96) for unfair denial of promotion. For Caribbean blacks, these odds are 5.7 (95 per cent CI: 2.61-12.45), 17.1 (95 per cent CI: 5.76-50.74) and 4.62 (95 per cent CI: 2.11-9.67) respectively. The models also indicate that the perception of race as hindrance to performance is strongly positively associated with one's self-report of racial discrimination at all levels of labour market activity (with odds ratios ranging between 1.92 and 2.73). Overall, satisfaction with life is also associated with discrimination reporting, where less satisfied respondents are more likely to report experience of discrimination while height has weak relationship with self-reports of hiring discrimination. However, the variables 'race as hindrance' and 'satisfaction with life' should be interpreted with caution as there could be some endogeneity issue confounding the results for these variables. For instance, a respondent can be less satisfied with life when experiencing discrimination and can consider race as hindrance due to experiences of racial discrimination. Whether the respondent speaks language other than English and/or has religious inclination show no statistically significant association with self-reports of labour market racial discrimination among the NSAL participants. (Results with further interpretation are reported in relation to table 5 below).

Table 4 - Odds-ratio from weighted logistic regression models: Self-Reported Racial Discrimination in the Labour Market with Additional Variables

	Model 1 Hiring Discrimination		*Model 2 Unfair Firing from Job*		*Model 3 Unfair Denial of Promotion*	
Parameters	*Odds ratio*	*95% CI*	*Odds ratio*	*95% CI*	*Odds ratio*	*95% CI*
Race (ref: non-Hispanic Whites)						
African American	4.39 ***	(2.12 - 9.08)	9.20 ***	(3.60 - 23.51)	8.46 ***	(4.79 - 14.96)
Caribbean Black	5.70 ***	(2.61 - 12.45)	17.10 ***	(5.76 - 50.74)	4.62 ***	(2.21 - 9.67)
Age (ref: 18-29 years)						
21-40	1.30	(0.85 - 2.01)	1.24	(0.84 - 1.84)	1.86 **	(1.07 - 3.23)
41-60	1.43	(0.91 - 2.22)	1.50	(0.85 - 2.63)	2.65 ***	(1.35 - 5.20)
>60	1.52	(0.80 - 2.91)	0.71	(0.35 - 1.47)	2.60 **	(1.09 - 6.21)
Gender (ref: Female)	1.69 **	(1.10 - 2.60)	1.60 **	(1.06 - 2.42)	2.01 ***	(1.19 - 3.39)
Marital Status (ref: Married)						
Divorced	1.33	(0.91 - 1.94)	1.13	(0.75 - 1.70)	0.95	(0.63 - 1.45)
Unmarried	0.98	(0.65 - 1.48)	0.96	(0.65 - 1.41)	0.48 ***	(0.28 - 0.83)
Employment Status (ref: Employed)						
Unemployed	0.97	(0.60 - 1.59)	0.98	(0.57 - 1.68)		
Not in Labour Force	0.61 **	(0.38 - 0.97)	0.96	(0.63 - 1.47)		
Years of Schooling (ref: Less than 12 Years)						
12 Years	0.72 *	(0.49 - 1.05)	0.87	(0.59 - 1.28)	1.28	(0.78 - 2.10)
13-15 Years	0.94	(0.61 - 1.45)	1.04	(0.70 - 1.54)	1.55 *	(0.93 - 2.58)
16 Years or Above	1.28	(0.70 - 2.35)	1.12	(0.61 - 2.07)	1.8	(0.88 - 3.71)
Household Size	1.07	(0.95 - 1.21)	0.90 *	(0.80 - 1.00)	1.05	(0.93 - 1.18)
U.S.-born (ref: Foreign-born)	1.45 *	(0.96 - 2.20)	3.24 ***	(1.54 - 6.81)	1.32	(0.67 - 2.60)
Region (ref: Northeast)						
Midwest	1.50 **	(1.04 - 2.19)	1.20	(0.71 - 2.02)	0.79	(0.42 - 1.49)
South	0.99	(0.73 - 1.34)	0.81	(0.53 - 1.22)	0.83	(0.56 - 1.22)
West	2.67 ***	(1.54 - 4.62)	1.48	(0.91 - 2.41)	0.98	(0.53 - 1.81)
Household Income						
18,000-21,999	1.35	(0.83 - 2.21)	1.43 *	(0.99 - 2.07)	0.74	(0.38 - 1.44)
32,000-54,999	1.00	(0.62 - 1.64)	1.01	(0.66 - 1.56)	0.78	(0.41 - 1.50)
55,000 or Above	1.25	(0.70 - 2.24)	1.15	(0.69 - 1.92)	0.94	(0.42 - 2.11)
Non English Speaking	0.90	(0.67 - 1.22)	0.98	(0.67 - 1.43)	0.89	(0.60 - 1.32)
Religious	1.09	(0.90 - 1.31)	0.99	(0.84 - 1.16)	1.07	(0.86 - 1.34)

Table 4 - Odds-ratio from weighted logistic regression models: Self-Reported Racial Discrimination in the Labour Market with Additional Variables (continued)

	Model 1 Hiring Discrimination		*Model 2 Unfair Firing from Job*		*Model 3 Unfair Denial of Promotion*	
Parameters	*Odds ratio*	*95% CI*	*Odds ratio*	*95% CI*	*Odds ratio*	*95% CI*
Satisfaction with Life	1.24 **	(1.03 - 1.51)	1.29 **	(1.05 - 1.59)	1.26 *	(1.00 - 1.60)
Height	1.05 **	(1.01 - 1.09)	0.99	(0.94 - 1.04)	1	(0.94 - 1.07)
Race Hinders Performance	2.73 ***	(2.03 - 3.67)	2.08 ***	(1.54 - 2.82)	1.92 ***	(1.35 - 2.73)
Hours Worked per Week (ref: < 21 Hours)						
21-40 Hours					0.43 **	(0.21 - 0.89)
41-60 Hours					0.57	(0.25 - 1.30)
More than 60 Hours					0.85	(0.26 - 2.77)
Occupation						
Professional (University Degree)	0.71	(0.39 - 1.31)	1.41	(0.57 - 3.45)	0.87	(0.37 - 2.03)
Associate Professional	0.89	(0.49 - 1.60)	1.02	(0.43 - 2.43)	0.6	(0.28 - 1.27)
Office Clerk	1.01	(0.46 - 2.23)	1.48	(0.57 - 3.87)	1.28	(0.48 - 3.40)
Customer Service	0.76	(0.36 - 1.60)	1.62	(0.69 - 3.82)	1.33	(0.48 - 3.71)
Personal Service Worker	0.73	(0.38 - 1.39)	1.60	(0.74 - 3.44)	0.58	(0.24 - 1.43)
Trade Worker	0.87	(0.43 - 1.74)	1.68	(0.67 - 4.23)	0.85	(0.36 - 2.03)
Operator	0.67	(0.31 - 1.44)	1.64	(0.67 - 4.06)	0.77	(0.32 - 1.83)
Routine Task Job	1.31	(0.64 - 2.69)	2.34 *	(0.88 - 6.17)	0.81	(0.32 - 2.08)
Other	0.69	(0.33 - 1.44)	1.98	(0.72 - 5.43)	0.54	(0.14 - 2.03)
Missing	1.04	(0.36 - 2.97)	0.74	(0.17 - 3.15)	0.85	(0.20 - 3.68)
Constant	0.0002 ***	(1.04e-05 - 0.003)	0.003 ***	(0.0001 - 0.05)	0.00 **	(0.00 - 0.37)
No. of Observations	4,900		4,900		3,454	
F-Statistic	13.96		15.59		10.39	
Df	36		36		37	
P-value	< 0.001		< 0.001		< 0.001	

Significance levels: * <0.1 ** <0.05 *** < 0.01.
Note: Model 1 compares the prevalence between racial minorities and non-Hispanic whites of self-reported experience of racial discrimination at the point of entry in the labour market in the United States based on the NSAL survey data. Model 2 compares these groups in relation to job termination, and Model 3 in relation to promotion. Some observations are dropped due to missing values. Model 1 and 2 are estimated for the whole sample while Model 3 is restricted to those who are employed.

Table 5 - Odds-ratio from weighted logistic regression models Controlling for Social Desirability Bias

	Model 1 Hiring Discrimination		*Model 2 Unfair Firing from Job*		*Model 3 Unfair Denial of Promotion*	
Parameters	*Odds ratio*	*95% CI*	*Odds ratio*	*95% CI*	*Odds ratio*	*95% CI*
Race (ref: non-Hispanic Whites)						
African American	4.13 ***	(2.03 - 8.39)	7.29 ***	(2.79 - 19.04)	7.44 ***	(3.53 - 15.68)
Caribbean Black	3.22 **	(1.26 - 8.25)	14.79 ***	(3.78 - 57.90)	4.95 ***	(1.51 - 16.29)
Age (ref: 18-29 years)						
21-40	1.29	(0.84 - 1.96)	1.22	(0.80 - 1.85)	1.83 **	(1.05 - 3.20)
41-60	1.40	(0.90 - 2.17)	1.47	(0.82 - 2.63)	2.62 ***	(1.33 - 5.17)
>60	1.50	(0.78 - 2.89)	0.68	(0.33 - 1.42)	2.50 **	(1.04 - 6.03)
Gender (ref: Female)	1.67 **	(1.09 - 2.56)	1.59 **	(1.05 - 2.40)	1.98 **	(1.18 - 3.33)
Marital Status (ref: Married)						
Divorced	1.34	(0.91 - 1.97)	1.16	(0.77 - 1.75)	0.99	(0.65 - 1.51)
Unmarried	0.98	(0.65 - 1.48)	0.97	(0.66 - 1.43)	0.49 **	(0.28 - 0.84)
Employment Status (ref: Employed)						
Unemployed	0.93	(0.57 - 1.52)	0.98	(0.57 - 1.68)		
Not in Labour Force	0.59 **	(0.37 - 0.95)	0.96	(0.63 - 1.48)		
Years of Schooling (ref: Less than 12 Years)						
12 Years	0.74	(0.51 - 1.08)	0.88	(0.60 - 1.31)	1.3	(0.80 - 2.12)
13-15 Years	0.97	(0.63 - 1.51)	1.07	(0.72 - 1.59)	1.60 *	(0.97 - 2.65)
16 Years or Above	1.30	(0.71 - 2.39)	1.13	(0.61 - 2.08)	1.83 *	(0.89 - 3.75)
Household Size	1.07	(0.95 - 1.21)	0.90 *	(0.80 - 1.00)	1.05	(0.93 - 1.18)
U.S.-born (ref: Foreign-born)	1.43 *	(0.93 - 2.17)	3.16 ***	(1.51 - 6.63)	1.29	(0.64 - 2.57)
Region (ref: Northeast)						
Midwest	1.53 **	(1.06 - 2.20)	1.19	(0.72 - 1.99)	0.8	(0.42 - 1.50)
South	0.99	(0.72 - 1.36)	0.78	(0.52 - 1.18)	0.8	(0.54 - 1.20)
West	2.66 ***	(1.51 - 4.66)	1.46	(0.91 - 2.35)	0.97	(0.53 - 1.79)
Household Income						
18,000-21,999	1.35	(0.83 - 2.21)	1.42 *	(0.98 - 2.04)	0.73	(0.38 - 1.43)
32,000-54,999	1.01	(0.61 - 1.66)	1.01	(0.66 - 1.54)	0.76	(0.40 - 1.46)
55,000 or Above	1.27	(0.71 - 2.30)	1.16	(0.72 - 1.88)	0.92	(0.41 - 2.07)
Non English Speaking	0.88	(0.66 - 1.19)	0.98	(0.66 - 1.44)	0.89	(0.60 - 1.32)
Religious	0.84	(0.55 - 1.28)	1.09	(0.67 - 1.75)	0.88	(0.50 - 1.55)
Satisfaction with Life	0.59 ***	(0.41 - 0.83)	0.68 *	(0.45 - 1.01)	0.86	(0.50 - 1.46)
Height	1.05 **	(1.01 - 1.09)	0.99	(0.94 - 1.04)	1	(0.94 - 1.07)

Table 5 - Odds-ratio from weighted logistic regression models Controlling for Social Desirability Bias (continued)

	Model 1 Hiring Discrimination		*Model 2 Unfair Firing from Job*		*Model 3 Unfair Denial of Promotion*	
Parameters	*Odds ratio*	*95% CI*	*Odds ratio*	*95% CI*	*Odds ratio*	*95% CI*
Race Hinders Performance	2.74 ***	(2.03 - 3.69)	2.09 ***	(1.55 - 2.82)	1.95 ***	(1.37 - 2.77)
Hours Worked per Week (ref: < 21 Hours)						
21-40 Hours					0.43 **	(0.21 - 0.90)
41-60 Hours					0.57	(0.25 - 1.30)
More than 60 Hours					0.82	(0.25 - 2.72)
Occupation						
Professional (University Degree)	0.70	(0.38 - 1.28)	1.38	(0.55 - 3.45)	0.86	(0.36 - 2.05)
Associate Professional	0.86	(0.47 - 1.57)	1	(0.42 - 2.38)	0.59	(0.28 - 1.27)
Office Clerk	1.00	(0.45 - 2.20)	1.47	(0.56 - 3.87)	1.29	(0.48 - 3.46)
Customer Service	0.74	(0.35 - 1.55)	1.63	(0.69 - 3.85)	1.36	(0.48 - 3.83)
Personal Service Worker	0.72	(0.38 - 1.37)	1.59	(0.74 - 3.42)	0.59	(0.24 - 1.46)
Trade Worker	0.84	(0.41 - 1.72)	1.64	(0.65 - 4.15)	0.86	(0.36 - 2.06)
Operator	0.66	(0.31 - 1.43)	1.65	(0.66 - 4.15)	0.79	(0.33 - 1.90)
Routine Task Job	1.28	(0.62 - 2.68)	2.29 *	(0.86 - 6.09)	0.8	(0.30 - 2.08)
Other	0.68	(0.33 - 1.40)	1.99	(0.72 - 5.52)	0.54	(0.14 - 2.04)
Missing	1.00	(0.35 - 2.89)	0.73	(0.17 - 3.20)	0.87	(0.20 - 3.78)
Social Desirability						
African Americans	1.06	(0.85 - 1.33)	1.18	(0.92 - 1.52)	1.1	(0.80 - 1.52)
Caribbean Blacks	1.48 *	(0.95 - 2.32)	1.1	(0.59 - 2.03)	0.94	(0.51 - 1.74)
Constant	0.0006 ***	(3.98e-05 - 0.01)	0.005 ***	(0.002 - 0.12)	0.01 **	(0.00 - 0.63)
No. of Observations	4,900		4,900		3,454	
F-Statistic	12.61		13.56		8.11	
Df	38		38		39	
P-value	< 0.001		< 0.001		< 0.001	

Significance levels: * <0.1 ** <0.05 *** < 0.01.
Note: Model 1 compares the prevalence between racial minorities and non-Hispanic whites of self-reported experience of racial discrimination at the point of entry in the labour market in the United States based on the NSAL survey data. Model 2 compares these groups in relation to job termination, and Model 3 in relation to promotion. Some observations are dropped due to missing values. Model 1 and 2 are estimated for the whole sample while Model 3 is restricted to those who are employed.

The number of hours worked in a week is linked with racial employment and earnings differential (Johnson and Neal, 1998) and there is evidence that it could potentially affect a worker's eligibility for promotion (Maume, 1999 and Peterson *et al*., 2004). We included hours worked in Model 3, but we find no evidence for an association between the number of hours worked and reports of discrimination with respect to promotion in the NSAL datasets (not reported here). We further disaggregated this variable into four categories, finding mixed results. Those who work less than 21 hours are more likely to report discrimination than those who work 21-40 hours a week. One possible explanation for this is the heterogeneity in number of hours worked between full-time and part-time employees. Some of the discrimination reported by the NSAL respondents could be attributed to the fact that part-time workers work less hours and hence they may feel more discriminated than the full-time workers. However this by no means eliminates all the racial discrimination reported in the NSAL datasets.

Finally, since social desirability has been associated with self-reported racial discrimination (Krieger *et al*., 2011) we included variables to control for social desirability (interacting it with the race variable). The results are summarised in tables 5 and 6. According to our findings, the Zuckerman-IPDE score for social desirability has no effect in any of the three models. Inclusion of this variable in the models leads to only slight change in the values, with the odds ratios becoming slightly smaller than in table 4. But, overall we find no evidence on its association with the self-reported experiences of discrimination in the labour market. For the Caribbean black category, however, there is marginally significant association between social desirability and hiring discrimination at the 10 per cent level. To investigate this in more detail, we excluded the social desirability score for the African American category and instead included a four-category social desirability score dummy variable for the Caribbean black category and we find that this variable strongly affects the coefficient of discrimination for this racial category. It appears that all self-reported experiences of racial discrimination among Caribbean blacks are explained by the characteristics included in the model. The effect also seems to be driven by those in the 11-20 and 21-30 score categories in the joint Zuckerman-IPDE Social Desirability scale included in the NSAL questionnaire as explained in section 2. Caribbean black respondents scoring between 11 and 20 are more likely to report experiences of discrimination than those who score less than 11. The likelihood increases among the 21-30 score range but there is no effect of social desirability on the self-reported experiences of discrimination among those who score between 31 and 44. The same analysis yields no change in the original results for the African American category. These results partially confirm the findings in Krieger *et al*., (2010) which demonstrated the absence of social desirability bias in self-reported experiences of discrimination among working class African American and Latino Americans. Some studies have found social desirability to be negatively associated with self-reported racism (Broudy *et al*., 2007 and Ensher *et al*., 2001) while others have failed to find any association (Clark, 2004 and Verkuyten, 1998). In this study, social desirability bias tends to affect only the self-report of labour market racial discrimination experience among Caribbean blacks. Controlling for social desirability bias and other covariates including socio-economic, demographic and human capital variables, the difference in self-reported experience of discrimination between

Caribbean blacks and non-Hispanic whites in the NSAL datasets disappears. But for the African American category in NSAL, the self-reported experience of discrimination persists even after controlling for social desirability bias. We are unsure why these results occurred, especially why an upward gradient is lacking in the propensity to reporting discrimination when social desirability score increases. However, one study (Consedine *et al*., 2012) has reported comparative results for social desirability with Caribbean blacks scoring slightly higher scores than African Americans.

Table 6 - Separate effects of social desirability bias on African Americans and Caribbean Blacks weighted logistic regression models

	Hiring Discrimination, Odds Ratio (95% CI)			
Parameters	*When African Black social desirability score included*		*When Caribbean American social desirability score included*	
Race (ref: non-Hispanic Whites)				
African American	4.16***	(1.89 - 9.16)	4.39***	(2.12 - 9.06)
Caribbean Black	5.65***	(2.59 - 12.32)	1.43	(0.57 - 3.60)
Age (ref: 18-29 years)				
21-40	1.32	(0.85 - 2.03)	1.33	(0.86 - 2.04)
41-60	1.44	(0.93 - 2.25)	1.44	(0.92 - 2.26)
>60	1.52	(0.79 - 2.93)	1.55	(0.81 - 2.97)
Gender (ref: Female)	1.69**	(1.10 - 2.60)	1.69**	(1.09 - 2.60)
Marital Status (ref: Married)				
Divorced	1.30	(0.89 - 1.91)	1.33	(0.91 - 1.95)
Unmarried	0.98	(0.65 - 1.47)	0.98	(0.65 - 1.49)
Employment Status (ref: Employed)				
Unemployed	0.98	(0.60 - 1.60)	0.97	(0.59 - 1.59)
Not in Labour Force	0.61**	(0.38 - 0.98)	0.61**	(0.38 - 0.98)
Years of Schooling (ref: Less than 12 Years)				
12 Years	0.72*	(0.49 - 1.05)	0.72*	(0.49 - 1.06)
13-15 Years	0.95	(0.62 - 1.45)	0.95	(0.61 - 1.46)
16 Years or Above	1.27	(0.69 - 2.33)	1.29	(0.70 - 2.37)
Household Size	1.07	(0.95 - 1.21)	1.07	(0.95 - 1.21)
U.S.-born (ref: Foreign-born)	1.44*	(0.95 - 2.19)	1.45*	(0.95 - 2.20)
Region (ref: Northeast)				
Midwest	1.50**	(1.03 - 2.17)	1.51**	(1.03 - 2.20)
South	0.99	(0.72 - 1.34)	0.99	(0.74 - 1.34)
West	2.69***	(1.55 - 4.66)	2.63***	(1.52 - 4.57)
Household Income				
18,000-21,999	1.36	(0.83 - 2.22)	1.36	(0.82 - 2.23)
32,000-54,999	1.02	(0.62 - 1.67)	1.01	(0.62 - 1.65)
55,000 or Above	1.27	(0.71 - 2.28)	1.26	(0.70 - 2.26)
Non English Speaking	0.91	(0.67 - 1.22)	0.9	(0.66 - 1.21)
Religious	1.08	(0.90 - 1.31)	1.09	(0.90 - 1.32)
Satisfaction with Life	1.24**	(1.02 - 1.50)	1.24**	(1.02 - 1.51)
Height	1.05**	(1.00 - 1.09)	1.05**	(1.01 - 1.09)
Race Hinders Performance	2.74***	(2.04 - 3.68)	2.74***	(2.04 - 3.68)
Occupation				
Professional (University Degree)	0.71	(0.39 - 1.29)	0.71	(0.39 - 1.31)
Associate Professional	0.87	(0.49 - 1.56)	0.88	(0.49 - 1.59)
Office Clerk	0.99	(0.44 - 2.21)	1	(0.46 - 2.21)
Customer Service	0.77	(0.37 - 1.61)	0.77	(0.37 - 1.62)
Personal Service Worker	0.72	(0.38 - 1.38)	0.73	(0.38 - 1.39)

Table 6 - Separate effects of social desirability bias on African Americans and Caribbean Blacks weighted logistic regression models

	Hiring Discrimination, Odds Ratio (95% CI)			
Parameters	*When African Black social desirability score included*		*When Caribbean American social desirability score included*	
Trade Worker	0.85	(0.43 - 1.70)	0.87	(0.43 - 1.74)
Operator	0.67	(0.31 - 1.44)	0.67	(0.31 - 1.45)
Routine Task Job	1.29	(0.62 - 2.68)	1.3	(0.63 - 2.68)
Other	0.70	(0.34 - 1.44)	0.68	(0.33 - 1.40)
Missing	1.04	(0.36 - 2.97)	1.04	(0.36 - 2.98)
Social Desirability Score Level (ref: Score<11)				
Score 11-20	1.00	(0.52 - 1.92)	3.04***	(1.62 - 5.68)
Score 21-30	1.22	(0.63 - 2.38)	5.87***	(3.02 - 11.41)
Score 31-44	0.84	(0.32 - 2.20)	1.47	(0.36 - 6.04)
Constant	0.002***	(0.00 - 0.004)	0.00***	(0.00 - 0.00)
No. of Observations	4,900		4,900	
F-Statistic	15.45		21.48	
Df	39		39	
P-value	< 0.001		< 0.001	

Significance levels: * <0.1 ** <0.05 *** < 0.01.
Note: Both models in this table are estimated for the whole sample. However, some observations are dropped due to missing values.

In general, the results in tables 3 to 6 show significantly higher levels of self-reporting experiences of racial discrimination at different stages of the labour market by African Americans and Caribbean blacks in the NSAL datasets. The results are consistent for both groups but more evident for the African American sub-sample when controlling for social desirability bias. If the perception of discrimination translates to consequences such as discouragement, as is shown by van Ham, Mulder and Hooimeijer, (2001), the effect is negative on labour market search and labour supply behaviours. African Americans and Caribbean blacks who perceive more discrimination in the labour market would be discouraged and participate less in labour market search, hence their labour is under-utilised. This has been shown to be the case by Neumark and McLennan (1995), Goldsmith *et al*., (2004) and Ozer and Gunluk (2010).

6. Conclusion

Previously, labour market analysts have in theory and empirically shown that racial discrimination is an important factor explaining the racial differentials in earnings and employment outcomes. However, although much progress has been made in methods of accurately utilising self-report data in other social sciences, most neoclassical studies of labour economics have only investigated discrimination indirectly from observational data. After reviewing the theoretical models of discrimination, this paper has discussed the empirical approaches developed by researchers of labour market discrimination. Based on the analysis of the NSAL datasets the paper

examined self-reported experiences of such discrimination in different stages of the labour market. It also integrated methods from psychology in validating the findings. The results show that in the NSAL data, racial discrimination in the labour market is evident for African Americans even after controlling for several confounders including social desirability bias while for Caribbean blacks self-reported racial discrimination is largely explained by this form of bias.

The findings of this study have a number of implications in the context of labour economics, including search theory, labour supply theory, the theory of internal labour markets and measurement approach to assessing discrimination in the labour market. The significant role of self-reported discrimination at the entry, termination as well as internal labour market stages implies discrimination is an important factor in the labour market and can contribute to behaviours affecting labour market search and hence labour supply. The findings also support the crowding model by showing the existence of discrimination in job promotion. In addition, our findings imply that self-report data can be equally efficient in measuring labour market discrimination, once appropriate controls are utilised. This implies that discrimination research in economics should not only focus on discrimination per se but also on perceived discrimination to understand its effects on the labour market and society as a whole. The paper has been able to measure discrimination from self-report data, detecting racial discrimination at different stages of the labour market while accounting for a range of socio-demographic factors as well as social desirability bias.

As such, this study contributes to our understanding of different facets of discrimination, as perceived by targets of discrimination, and their impact in labour market outcomes. The analysis of this study has been based on cross-sectional data. Future research should investigate the findings based on longitudinal data. We also strongly suggest similar study to be conducted based on Australian data. To-date representative population-level self-reported experiences of discrimination data (based on probability sampling) are not available in Australia. Items on this topic could be added to the ABS General Social Survey. There is precedence for this in the New Zealand Health Survey which includes several questions on racism (Harris *et al*., 2012).

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