RACIAL DISCRIMINATION IN POST-APARTHEID SOUTH AFRICA: AN EXPERIMENTAL ANALYSIS

Andre Hofmeyr
(HFMAND005)

Abstract:

This paper adopts an experimental approach to analyse racial discrimination among a sample of South African schoolchildren. Using an anonymous identity treatment we are able to operationalise Becker's (1957) notions of discrimination and nepotism and identify these patterns of behaviour in the data. We find that Blacks display a nepotistic out-group bias and therefore favour non-Blacks over Black and anonymous individuals. Coloureds display a nepotistic in-group bias and therefore choose to transfer larger amounts to Coloureds than to non-Coloured and anonymous individuals. Whites do not practise discrimination or nepotism and send similar amounts to all race groups. Interestingly, Blacks, Coloureds and Whites take into account statistical concerns when making their offers and their behaviour is thus a complex mix of 'tastes' for discrimination and 'statistical' discrimination.

I. INTRODUCTION

Racial discrimination, broadly defined as the "differential treatment of identically situated individuals of different races", is pervasive in contemporary society (Myers et al., 2003). In a cross-national study of inter-group disparity, Darity and Nembhard (2000) find that economic inequality is correlated with race and ethnicity and looks remarkably similar across a diverse set of countries. Their results show that marked economic disparity between races or ethnic groups occurs in states with both large and small populations, in those that are high-income or lower-income, and in those with high growth rates or low or negative growth rates. In addition, inter-group disparities are evident in countries with high levels of general inequality as well as in countries with low levels of general inequality (Darity & Nembhard, 2000). While there is widespread disagreement in the literature as to the exact causes of these disparate outcomes, there is also general acceptance that discrimination, be it market or pre-market discrimination[1], has played a role in the emergence and persistence of inequality between race groups.

This paper's raison d'etre is to track the theoretical and empirical developments in the study of racial discrimination and to highlight and employ a new experimental method, on a sample of South African schoolchildren, for directly testing whether members of particular race groups treat other race groups differently. To this end, Section II will provide an historical account of South Africa's political economy in the 20th century that will inform one's understanding of its contemporary labour market. Section III will discuss theoretical attempts to model racial discrimination. Section IV will review the empirical methodology employed in studies of discrimination and Section V focuses specifically on empirical attempts to analyse discrimination in South Africa. Section VI outlines Fershtman, Gneezy and Verboven's (2005) experimental method for analysing discrimination using a trust game. Section VII describes the sample and experimental procedure used in the analysis. Section VIII discusses the results from our study and Section IX concludes.

[1] The term "pre-market discrimination" refers to discrimination that takes place prior to an individual's entry into the labour market and is typically associated with discrimination in education.

II. BACKGROUND TO SOUTH AFRICA'S CONTEMPORARY LABOUR MARKET

The National Party's accession to power in 1948 brought with it a system of overt racial discrimination and segregation that was institutionalised in South Africa until 1994. Dr Verwoerd is typically viewed as the archetype of Apartheid and was undoubtedly instrumental in the evolution of an inherently racist state but Freund (1988) argues that an informal system of racial segregation had been in place in South Africa for over two hundred years. Verwoerd's plan was to create two nations within one country by demarcating land reservations for non-Whites where they could live and support themselves. However by the middle of the twentieth century many Blacks were dependent on low wage jobs from White businesses, which produced social, political and economic tension in South Africa (Hinks, 1999).

At the turn of the twentieth century, most Blacks were employed in the mining sector but an increasing number came to be employed in the burgeoning manufacturing sector. Expansion of this sector during the inter-war years led to the increasing employment of non-Whites but unofficial occupational colour barring practices limited their occupational mobility – an outcome that was strongly supported by the influential White trade union movement of the time. With the adoption of Apartheid came official job reservation and colour barring policies, like the Industrial Conciliation Act of 1956, which reserved semi- and high-skilled jobs exclusively for Whites. Controversial Pass Laws, enacted in 1952, were designed to restrict the movement of non-Whites and required that they always carry their pass books or face heavy fines or imprisonment (Hinks, 1999).

Despite these measures the apartheid system came under increasing strain due to its contradictory nature. Although Whites and non-Whites lived in largely separate areas and were typically employed in different occupations, growth of the South African economy increasingly required both White and non-White workers. The White economy's reliance on non-White labourers posed a serious problem to the ruling National Party because it challenged their racist ideology based on separateness. Attempts to limit the economy's dependence on non-White labourers – by, for example, employing Malawian nationals – were ultimately fruitless because the

demand for semi-skilled and skilled labourers far outstripped the supply. Consequently the interests of White business came into direct conflict with that of the National Party and White trade unions. Towards the end of the 1960s, the National Party finally conceded by relaxing job reservation policies which allowed non-Whites to attain skilled employment. Although occupational mobility for non-Whites was now condoned, a policy of equal pay for equal work was not adopted. Instead occupational discrimination was replaced by wage discrimination (Hinks, 1999).

Much to the National Party's dismay, the relaxation of Apartheid employment practises was no panacea for the overheating South African economy because the system of Bantu education failed to equip non-Whites with adequate skills for the jobs that White businesses demanded. The Bantu Education Act of 1953 was specifically designed to keep Blacks relatively uneducated so that they did not pose a threat to White workers. This policy became increasingly untenable and as a result public expenditure on Black education increased by 26 percent per year, on average, from 1973 to 1977 (Lundahl and Wadensjo, 1984). This led to a marked increase in Black graduation from school which lowered the Black-White earnings differential from the mid-1970s onward. However, research by Donaldson and Roux (1990) and Case and Deaton (1997) shows that Black education in the 1980s and early 1990s was inferior to White education and attribute the increased Black graduation rates to a lowering of standards rather than an improvement in teaching quality.

South Africa's policy of Apartheid was formally dismantled with the first free democratic elections in 1994. As is evident from the preceding discussion, the system was highly inequitable, which not only limited the life-chances of those who lived through it but also the opportunities of the current generation who face its after effects. Outright discrimination in all segments of the labour market and pre-market discrimination in education still manifest themselves in large earnings, occupational and employment differentials between race groups. Consequently measures to redress Apartheid policies have been enacted.

The Employment Equity Act (1998) was introduced to eliminate the legacy of discriminatory laws that engendered disparate outcomes in employment, occupation and income. It therefore stipulates that employers must eradicate all forms of unfair

discrimination, draw up employment-equity plans to ensure the equitable representation of all specified groups and submit annual reports detailing the progress that they have made on these fronts to the Department of Labour. Thus, its primary aim is to achieve work place equity by promoting the opportunities of previously disadvantaged groups (Burger and Jafta, 2004).

The Skills Development Act (1998) and the Skills Development Levies Act (1999) are designed to promote human resource development through skill acquisition. Together they require that employers contribute to the education and training of their workforce and contribute 1 percent of their annual revenue to the Sectoral Education and Training Authority.

These laws, when coupled with others like the Labour Relations Act (1995) and the Broad-based Black Economic Empowerment Act (2003), have been enacted to mitigate and eventually overturn the legacy of Apartheid policies. Nevertheless, South Africa is still plagued by gross income inequality and precipitously high unemployment. Consequently, numerous scholars have sought to investigate the presence and persistence of racial discrimination in the 'new' South Africa. These studies will be analysed in section V but to understand their place in the literature a discussion on the theoretical and empirical developments in the study of racial discrimination is in order.

III. THEORETICAL MODELS OF DISCRIMINATION

A logical starting point for a discussion on theoretical models of discrimination is with Becker's (1957) "taste for discrimination" model, which was one of the first[2] and most influential papers in this strand of the literature.

A 'TASTE' FOR DISCRIMINATION

In the true spirit of economics, Becker (1957) uses money as a measure of discrimination and argues that "if an individual has a 'taste' for discrimination, he must act *as if* [italics in original] 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" (Becker, 1971: 14). Actual discrimination therefore only occurs when an individual either pays or forfeits income to indulge this 'taste'.

To formalise this notion, Becker defines a "discrimination coefficient" which acts as a bridge between the money costs of a particular transaction and the net costs which result. For example, the wage rate w that an employer must pay for a particular factor of production constitutes the money costs of this transaction. However, the employer is assumed to act as if $w(1+d_i)$ is the net wage rate for this factor, with d_i ($\infty > d_i > -\infty$) as his discrimination coefficient against this factor. Similarly, an employee who is paid the wage rate w_j for working with this factor, acts as though $w_j(1 - d_j)$ is the net wage rate, with d_j as the discrimination coefficient against this factor. Finally, a consumer who wishes to purchase a product, at price p, produced by this factor, will act as if the net price were $p(1 + d_k)$, with d_k as his discrimination coefficient against this factor.

[2] Although Edgeworth (1922) apparently provides the first statement of the neoclassical theory of discrimination, it was Becker's (1957) model that pioneered the systematic study of discrimination by economists, both for its clarity and the time when it was written - Becker's thesis predates the passing of the Civil Rights Act of 1965 and was thus written in a climate of increasing awareness of the disparities between race groups in the US.

Having defined a discrimination coefficient, Becker draws the distinction between discrimination and nepotism[3]. Discrimination is typically associated with the *disutility* an individual experiences by associating with certain individuals whereas nepotism refers to the *utility* an individual enjoys from associating with particular individuals. Consequently, when discrimination is practised, the discrimination coefficients d_i, d_j, and d_k are all greater than zero, and represent the non-monetary costs of production, employment and consumption, respectively. On the other hand, nepotism implies that d_i, d_j, and d_k are less than zero and represent the non-monetary returns of production, employment and consumption, respectively. Multiplying these discrimination coefficients through by the respective wages and prices transforms these non-monetary costs and returns into exact monetary equivalents, which can then be used to estimate the quantitative significance of discrimination.

The use of discrimination coefficients allows one to classify discrimination or nepotism at the individual level. To analyse discrimination at the level of the market as a whole, Becker makes use of an analogous concept, the "market discrimination coefficient" (Becker, 1971: 17). Given perfectly competitive markets and the absence of discrimination and nepotism, two groups of individuals, W and B, which are perfect substitutes in production, should receive equal wages in equilibrium. However, discrimination can cause these wage rates to differ and the market discrimination coefficient captures this possibility. It is defined as:

$$MDC = \frac{w_W - w_B}{w_B}$$

where w_W and w_B are the average wage rates of the W and B groups, respectively. The individual discrimination coefficients and the market discrimination coefficient are linked by the behaviour of employers, employees and consumers. Take the behaviour of an employer who favours W individuals and discriminates against B individuals even though they are identical in their productive capacities, for example. He would thus be willing to pay $w(1+d_i)$ for his favoured W workers but only $w(1-d_i)$ for the other B workers. If this behaviour is typical of the economy as a whole, the average

[3] This distinction is particularly relevant to the experimental method employed in this paper.

wage of W workers, w_W, will be greater than the average wage of B workers, w_B, and the *MDC* will be positive, indicating that B workers are discriminated against[4,5].

Becker also adopts an international trade model to analyse the effects of discrimination on trade between two 'societies', one inhabited solely by W individuals and the other inhabited solely by B individuals. Focussing only on capital and labour and the trade of these factors between the 'societies', Becker assumes that W is relatively capital abundant and B is relatively labour abundant. Thus, $(K_W/L_W) > (K_B/L_B)$, where K refers to capital and L to labour and the subscripts denote the two groups, W and B. Hence W exports its relatively abundant factor, K, and B exports its relatively abundant factor, L. With no discrimination, equilibrium implies that:

- Factor prices will be equalised across the two 'societies';
- The price of each product is independent of where it is produced;
- The payment to each factor equals its marginal value product.

However, if W has a taste for discrimination against B, it will be willing to forfeit money income to avoid transacting with B. This discrimination lowers the net return to W capital for combining with B labour and thus lowers the amount of capital exported. This, in turn, reduces the amount of B labour exported and reduces the equilibrium net incomes of both W and B. This change in resource allocation also affects the returns to factors in the different 'societies': the return to W capital and B labour decrease while the return to W labour and B capital increase. As is evident from the preceding discussion, trade is maximised in the absence of discrimination but decreases for every increase in discrimination, which lowers the net incomes of both 'societies'.

---

[4] This example may suggest that summing individual discrimination coefficients allows one to arrive at the market discrimination coefficient; it should not. This example was used simply to show how individual discrimination coefficients can affect the market discrimination coefficient but Becker is quick to point out that numerous other factors, like the number of B individuals relative to W individuals and the extent of competition in particular industries, have independent effects on the *MDC* and have to be taken into account in its calculation.

[5] One may wonder why the last phrase reads, "B workers are discriminated against" as opposed to "W workers are discriminated in favour of". This highlights one of the difficulties in using the *MDC* because, as Becker notes, it makes discrimination and nepotism empirically indistinguishable (Becker, 1971: 160).

Becker's (1957) model shows how discrimination can alter resource allocation and undermine efficiency in an economy. Perhaps the most striking conclusion of his model though, is that discrimination cannot persist in the long run because non-discriminating employers, employees and consumers will drive the discriminators out of the market. Numerous extensions of his work by Krueger (1963), Alexis (1973, 1974), Freeman (1973), Bergmann (1970, 1971) and Arrow (1972, 1973) refine some of the concepts and assumptions used in the paper but arrive at the same conclusion. This clearly presents a challenge to neoclassical models because empirical evidence suggests that discrimination is remarkably persistent – refer to Sections IV and V for a more detailed discussion on the empirical results of studies of discrimination.

Marshall (1974) levies other theoretical critiques on neoclassical models of discrimination. His primary objection to these models is their preoccupation with theoretical consistency. Consequently, he asserts that neoclassical economists:

1) Struggle to provide a definition of discrimination that is plausible
2) Assume discrimination is an exogenous factor despite the fact that their models seek to explain it.
3) Arrive at conclusions which follow from the specification of their models and thus provide few insights into the phenomenon that is discrimination
4) Exclude important variables, like bargaining over racial employment practises and the influence of unions, that presumably influence discrimination
5) Focus on explaining quantities, like racial wage differentials for equally productive individuals, that are considered central to discrimination but have never been proved to be and are likely to influence discrimination through channels not stipulated by neoclassical models
6) Provide misleading policy implications and suggestions.

Given the theoretical shortcomings of the neoclassical model, other frameworks for understanding racial discrimination have been proposed in the literature. Arrow (1973) and Phelps (1972) introduced models of discrimination based on perceptions of reality. The basic notion is that if employers have the preconceived idea that *B* workers are less productive than *W* workers, even though their productive capacities are in fact identical, then they will hire them only at lower wages. This in turn affects *B* workers' incentives to invest in costly signals of their productivity. Consequently,

the average productivity of B workers falls below that of W workers thereby confirming the expectations of employers and justifying the wage differential, even though there are no innate differences in the productive capacity of B and W workers. These models of "statistical discrimination" pioneered a large literature which focuses on how information or beliefs can lead to discriminatory market outcomes. Arrow's (1973) model is the most influential in this field so his argument will be presented before other noteworthy contributions are discussed.

'STATISTICAL' DISCRIMINATION

Arrow (1973) lists three conditions under which the perceptions of employers can lead to the discriminatory outcome discussed above. First, employers must be able to distinguish between B and W workers at a reasonably low cost. Second, the employer must incur a non-negligible cost before he can accurately determine a worker's true productivity – in Arrow's model this takes the form of a personnel investment cost. Third, the employer must have some idea about the distribution of productivity within each category of worker, B and W.

Arrow then assumes that there are two kinds of jobs, skilled and unskilled, and that all workers are qualified for unskilled jobs but only some are qualified for skilled jobs. The employer must make a personnel investment when hiring skilled workers but does not know with certainty whether any individual is qualified for a skilled job. He does however believe that the probability of a W worker being qualified is p_W and the probability of a B worker being qualified is p_B. Given that the employer invests in his 'skilled' workers, he expects to recoup this cost by the difference between the marginal productivity of skilled workers and the wage that he pays them. However, without knowing whether a particular individual will be qualified for a skilled job he bases his necessary return on the probability of an employee being qualified. Thus,

$$r = (MP_S - w_W)p_W = (MP_S - w_B)p_B$$

where r is the necessary return per worker on the personnel investment for skilled jobs, MP_S is the marginal productivity of skilled workers, and w_W and w_B are the wages of W and B workers. Solving this equation for w_W we get:

$$w_W = qw_B + (1-q)MP_S$$

where $q = p_B/p_W$. Given that $w_B < MP_S$ for the employer to recoup his personnel investment cost, if $p_B < p_W$ for any reason, then $w_W > w_B$. Thus any difference in the perceived probability of W and B workers being qualified for skilled jobs will manifest itself in a wage differential between these groups. If instead w_W cannot differ from w_B, due to price rigidities or employment equity legislation, differences in the probability of B and W workers being qualified for skilled positions will result in the refusal to hire B workers for skilled jobs.

The question that naturally arises in this model is how these beliefs about the differences in the productive capacities of the two groups of workers can be maintained when there are no intrinsic differences in the productivity of these groups. Arrow makes use of Festinger's (1957) theory of cognitive dissonance which states that beliefs and actions tend to come into some sort of equilibrium. In this context, if employers discriminate against one group of workers then they will tend to acquire beliefs which justify these actions. Given that discriminatory behaviour is ethically abhorrent and illegal in most nation states, employers will be even more inclined to use subjective probabilities about differences in productivity as the rationalisation for their conduct.

Why then, do B workers not force employers to revise their expectations by acquiring better signals for their productivity? This is the crux of Arrow's argument. Assuming that a wage differential exists between B and W workers due to differences in the expected probability of productivity, B workers will be less inclined to invest in costly signals of their productivity which will then confirm the employer's initial beliefs. In other words, an initial discriminatory act will create a self-fulfilling prophecy

whereby *B* workers do not invest in signals, which confirms the expectations of employers and allows them to justify the wage differential[6].

Other models of statistical discrimination were proposed by Phelps (1972) and Aigner and Cain (1977) which are based on the quality of information that employers receive about *B* and *W* workers. In these models, personnel managers predominantly belong to the *W* group and are therefore better at assessing the productivity of *W* as opposed to *B* workers. The wage offered in these models is a weighted average of an individual's signal of his own productivity and the average productivity of the group he belongs to. Given that personnel managers are better at assessing the productivity of *W* workers, their signal has less noise and the employers will therefore place more weight on their signal than the signal of *B* workers. This results in a wage differential between the two groups. As a result of the noisier signal of *B* workers, they will face a lower return to human capital investments which, as Lundberg and Startz (1983) recognise, will lead to an equilibrium where *B* workers are less productive and consequently receive lower wages. Thus, owing to information asymmetries, *B* workers invest less in productivity signals which confirms the preconceptions of employers and leads to wage differentials.

While some scholars have argued that statistical discrimination models suffer from the same critique as taste-based models, in that competition should drive out discriminating employers, Loury (2002) shows why this is not necessarily the case. The ability of employers to affect the information or preconceived notions of themselves or other employers depends on the market in which they operate. In competitive markets, employers that dispense with race as a signal for productivity are essentially discarding information that is substantively useful[7], while having very little effect on the actions of others, and consequently they do not have an incentive to do so. Although monopolists have the ability to alter their own conceptions of the productivity of particular groups, Loury (2002) argues that they must be predisposed to experimentation for this to occur. In addition, the likelihood of them engaging in

[6] Note that Coate and Loury (1993b) develop a model of statistical discrimination that is similar in spirit to Arrow (1973) but focuses on occupational as opposed to wage discrimination.

[7] Race is substantively useful because it conveys information regarding the expected productivity of a worker, particularly given the feedback effects described previously.

this experimentation depends on whether the facts they receive are anomalous to their expectations. Given that the processes, discussed above, can lead to self-fulfilling prophecies about the productivity of B workers, monopolistic employers will have little incentive to engage in critical experimentation to alter their, now confirmed, expectations.

Although taste-based and statistical models are the primary frameworks for understanding racial discrimination, models of the intergenerational transmission of inequality have been used to show how racial differences in earnings or occupational status can persist over time.

INTERGENERATIONAL TRANSMISSION OF INEQUALITY

Models of the intergenerational transmission of inequality have typically focussed on the family as the mechanism which transmits economic status across generations. The idea is that a child's human capital is positively associated with the human capital of his parents because parents affect an individual's attitude to work and education and they endow him with skills and social connections that affect his labour market outcomes (Lundberg & Startz, 2000: 280). Loury (1977) chose a broader conceptualisation of this process, arguing that the community and home environment exert an influence on the acquisition of human capital. Loury (1977) coined the term "social capital" which refers to the average stock of human capital in a community and which is assumed to positively influence the human capital of the next generation. If communities are segregated by race and income - due to, say, racial discrimination in housing and labour markets - then social capital can create a feedback effect that reproduces racial inequality over time. The mechanics of this process are straightforward – this exposition follows Lundberg and Startz (2000).

Consider two groups of individuals, W and B, and let A denote ability, S social capital, and H human capital. Thus, A_i^W is the innate ability of the ith person from group W and H_i^B is the human capital of the ith person from group B etc. Assume that there is no difference in the intrinsic ability of B and W individuals. We will confine the

discussion to the community of *B* individuals by assuming that their level of human capital does not affect the *W* community.

Assume that *B*'s human capital depends on ability and the social capital of the current and previous generations. Thus,

$$H_{t,t}^{B} = A_{t,t}^{B} + \alpha\left[(1-\gamma)S_{t}^{B} + \gamma S_{t-1}^{B}\right]$$

with α, $0 < \alpha < 1$, representing the importance of social capital as opposed to ability in the human capital acquisition process and γ, $0 < \gamma < 1$, representing the importance of current levels of social capital relative to past levels of social capital. The social capital of the *B* community depends on the average levels of human capital in the *W* and *B* communities. Thus,

$$S_{t}^{B} = \beta\overline{H}_{t}^{B} + (1-\beta)\overline{H}_{t}^{W}$$

where β, $0 < \beta < 1$, represents the degree of segregation between the *B* and *W* communities. If we solve the above equations for the average level of human capital in the *B* community we get:

$$H_{t}^{B} = \frac{1}{1-\alpha\beta(1-\gamma)}\left\{A_{t}^{B} + \alpha(1-\beta)\left[(1-\gamma)H_{t}^{W} + \gamma H_{t-1}^{W}\right]\right\} + \frac{\alpha\beta\gamma}{1-\alpha\beta(1-\gamma)}H_{t-1}^{B}$$

This simplified model can be used to show how past discrimination can persist into the present even though there is no contemporaneous discrimination and there are no differences in the inherent productive capacities of *B* and *W* workers. Discrimination can be represented by a reduction in *A*. This implies that the ability of *B* workers is undervalued by the market. If $\alpha > 0$, then the discrimination faced by *B* workers will reduce the social capital of their community and, through a feedback effect, lead to a decrease in human capital. For this instance of discrimination to persist into the future though, some degree of segregation between the *B* and *W* communities is required ($\beta > 0$). To simplify matters and to focus on the role of segregation, assume that the

intergenerational transmission of social capital has a profound effect on human capital formation ($\alpha = \gamma = 1$). The above equation then reduces to:

$$H_t^B = \overline{A}_t^B + (1-\beta)\overline{H}_{t-1}^W + \beta\overline{H}_{t-1}^B$$

As is evident, with complete segregation between the *B* and *W* communities, $\beta = 1$, past discrimination persists indefinitely, which negatively affects the human capital of the *B* community and their labour market outcomes. Thus, the model shows that with segregated communities and a social capital externality, past discrimination has a legacy which maintains racial inequality, despite the lack of inherent differences in the productive capacities of these groups.

The preceding discussion has highlighted the major themes in the theoretical study of racial discrimination. Against this backdrop, the paper now presents empirical approaches to understanding racial disparities in market outcomes.

IV. THE EMPIRICS OF RACIAL DISCRIMINATION

Numerous methods for empirically identifying racial discrimination have been proposed in the literature. These include:

- regression techniques to estimate racial differences in earnings or occupational attainment;
- audit studies that send individuals of different races, who are as similar in every other respect considered important for employment, to job interviews to ascertain whether certain race groups receive differential treatment;
- various experimental methods;
- correspondence studies which send similar resumes to employers but vary the names of the applicants to signal race or ethnic group;
- and the outcomes of racial discrimination lawsuits.

The paper proceeds with a discussion on regression techniques that have been employed to uncover labour market discrimination because these are the most widely used of all the approaches identified above.

REGRESSION TECHNIQUES

The most straightforward approach to identifying racial discrimination in an econometric context is to run a regression of wages or occupational attainment on a set of productivity-linked control variables and racial dummies. The idea being that if differences in productivity between individuals can be controlled for then any disparity in market outcomes between race groups must be due to differences in treatment. Thus, if racial dummies have significant explanatory power in these regressions then this is taken as evidence of labour market discrimination.

The most widely used method for identifying racial discrimination was proposed independently by Blinder (1973) and Oaxaca (1973). The so-called Oaxaca-Blinder decomposition technique involves the estimation of separate earnings or occupational

attainment regressions for a particular racial reference group and all other race groups that will be compared to it. In so doing, one can identify the proportion of the wage gap that is attributable to skills and that which is due to differences in labour market treatment. The benefit of this method is that it allows the coefficients for the different race groups to take on different values (Darity & Mason, 1998).

THE OAXACA-BLINDER (O-B) DECOMPOSITION

To highlight the methodology, we will focus on a typical wage earnings function where the dependent variable is the log of wages and the regressors are a set of individual characteristics[8]. In matrix notation:

$$\ln W = X\beta + \varepsilon$$

where X includes a constant. To analyse racial discrimination we take the difference in the average log of wages between Whites and Blacks:

$$\ln \overline{W}_W - \ln \overline{W}_B = \overline{X}_W \beta_W - \overline{X}_B \beta_B$$

where $\overline{W}_W$ and $\overline{W}_B$ are the average wages of White and Black workers, respectively, and $\overline{X}_W$ and $\overline{X}_B$ are vectors containing the productivity-linked characteristics of White and Black workers evaluated at their means. β_W and β_B are vectors of coefficients which represent the market's valuation of the characteristics in $\overline{X}_W$ and $\overline{X}_B$. Thus, if β_W and β_B differ significantly, then the market rewards identical productive capacities differently according to the race group which possesses them.

[8] Note that the methodology has been extended to deal with dichotomous variables (Gomulka & Stern, 1990; Altonji & Blank, 1999) and categorical variables (Banerjee & Knight, 1985).

The above equation can be re-written as:

$$\ln \overline{W}_W - \ln \overline{W}_B = (\overline{X}_W - \overline{X}_B)\beta^* + \overline{X}_W(\beta_W - \beta^*) + \overline{X}_B(\beta^* - \beta_B)$$

where β^* is the vector of coefficients that would prevail in the absence of discrimination. The wage gap can now be viewed as the combination of three components: a wage differential stemming from differences in productivity between White and Black workers $(\overline{X}_W - \overline{X}_B)\beta^*$; the difference between what White workers are paid and what they would be paid in the absence of discrimination $\overline{X}_W(\beta_W - \beta^*)$; and the difference between what Black workers would receive and what they do receive in an imperfect labour market $\overline{X}_B(\beta^* - \beta_B)$.

To employ the above specification, an assumption concerning racial discrimination needs to be made so as to operationalise the vector of coefficients that would obtain in the absence of discrimination, β^*. If one assumes that Whites are paid a wage equivalent to their marginal product, and that the wage gap results from the discriminatory treatment of Blacks, then $\beta^* = \beta_W$ because the White wage structure would prevail in a non-discriminating labour market – this is the approach adopted by Blinder (1973). Thus, the above equation reduces to:

$$\ln \overline{W}_W - \ln \overline{W}_B = (\overline{X}_W - \overline{X}_B)\beta_W + \overline{X}_B(\beta_W - \beta_B)$$

A potential problem with this specification is that it uses the somewhat arbitrary assumption that the White wage structure is that which would prevail in the absence of discrimination. To address this issue, Neumark (1988) extended the neoclassical model of discrimination to derive the Oaxaca-Blinder decomposition from it, thereby grounding the analysis on a firm theoretical foundation. According to his methodology, β^* can be obtained from a regression on the pooled sample of the two race groups. As this method uses the full sample, it has the added benefit of producing estimates with lower variance.

CRITIQUES OF THE O-B METHODOLOGY

Despite its widespread application, the Oaxaca-Blinder methodology has some notable drawbacks. First, the approach assumes that data on all productivity-linked characteristics can be obtained (for example, data on school quality and individual ability). Given that this data does not exist in typical datasets, the estimate of the extent of racial discrimination will be biased by the omission of variables. An added complication is that there is disagreement in the literature as to whether this bias is positive or negative so one cannot state unequivocally whether the estimate constitutes an upper- or lower-bound of discrimination. Furthermore, without adequate control variables, regressions using typical datasets (like a census) only ever explain 20 to 30 percent of the variation in wages. Compare this to the 60 to 80 percent of the variation in wages that has been explained when using firm-level personnel data and it is understandable why scholars like Heckman (1998) argue it is implausible to assign the residual wage gap to discrimination when so much is left unexplained in a typical wage regression.

Second, the Oaxaca-Blinder approach suffers from selection bias because employed individuals are not a random sample from the population, which can lead to inconsistent estimates when using single equation techniques. This is a point made by Loury (1981), who argues that studies which focus on wage disparities between race groups necessarily misrepresent the extent of discrimination because they do not take into account unemployment patterns across race groups. To remedy this problem, Heckman (1979) proposed a two-step procedure which first estimates selection into the relevant sample. Using the artificial regressor obtained in the first step, Heckman showed that the β's in the above model can be consistently estimated.

Third, Oaxaca-Blinder-type regressions often include occupational dummies in their specification, thereby implicitly assuming that occupational selection is exogenous. Given that certain races may face a glass ceiling in terms of access to skilled occupations it is therefore necessary to model occupational selection as endogenous. Fortunately, Brown, Moon and Zoloth (1980) developed a procedure to overcome this problem by endogenising selection into occupations.

Fourth, the Oaxaca-Blinder decomposition is a cross-section data technique which therefore limits its ability to dynamically track the outcomes of different race groups over time. Although an analysis of cross-sections at different points in time can give one an indication of whether discrimination is increasing or decreasing it is necessarily a far more crude method than one which could be applied to panel data. Loury (1981) makes the point that although wage disparities between White and Black male workers in the US have decreased post-1965, this does not accurately reflect the extent of discrimination because while starting wages are similar across groups, White wage growth far exceeds Black wage growth. Furthermore, Blacks are more downwardly mobile from high-paying occupations and less upwardly mobile from low-paying occupations. Thus, although the Oaxaca-Blinder approach can be meaningfully applied to cross-section data, it obscures certain trends in racial discrimination that can only be picked up by using panel data techniques.

Finally, the Oaxaca-Blinder methodology compares the wages of Black and White workers at the mean of the distribution. As discriminatory forces may exert different influences at different points in the wage distribution, focusing purely on the mean may distort the overall discrimination picture. Consequently, Juhn, Murphy and Pierce (1991, 1993) developed a procedure for applying the decomposition at different points of the wage distribution.

The Oaxaca-Blinder decomposition is the most widely used empirical approach for analysing discrimination. Despite its shortcomings listed above, the methodology - and its extensions - can be usefully applied to labour market data to investigate discrimination. Studies by Darity, Guilkey and Winfrey (1996), Rodgers and Spriggs (1996), and Gottschalk (1997) find that Black men in 1980 and 1990 suffered a 12 to 15 percent loss in earnings due to labour market discrimination in the US. In Section V we will review papers that have applied this approach to the South African labour market. Before doing so, we discuss other empirical methods for analysing racial discrimination.

Two closely related approaches for analysing racial discrimination are audit and correspondence studies. These techniques, which use carefully controlled field

experiments to test for discrimination, have been around for almost 40 years and have shed enormous light on discrimination in labour, housing and product markets, despite the controversy surrounding them.

AUDIT STUDIES

Audit studies were pioneered by Daniel (1968) who used matched pairs of actors – one from the majority and one from the minority population groups - to test for discrimination in the British housing and labour markets. A matched pair was given identical qualifications and was coached so as to align the two individual's presentation styles. In addition, two similar curriculum vitaes (CVs) were prepared for the matched couple, which were then rotated between the individuals to control for the unintended superiority of one CV over another. The idea being that if one can match individuals as closely as possible on all dimensions considered important for employment whilst using individuals of different races then any differential treatment can be ascribed to discrimination. Daniel (1968) found that net discrimination[9] against non-Whites was approximately 90 percent.

Three types of audit studies have been used in the literature (Riach and Rich, 2002). First, matched pairs have responded to job advertisements telephonically where race is signalled by name and accent. This method only tests for discrimination at the initial stage of the hiring process but allows for a great deal of control over the responses of the matched pair. Second, individuals are sent to job interviews either in response to advertisements requiring personal attendance or through face-to-face inquiries about job availability. Third, individuals initially apply for a job telephonically or via post, fax or email and then, conditional on being invited, they take part in the interview process. The third approach is thus a combination of the first two and it allows the researcher to investigate discrimination at all stages in the hiring process. Table I below represents the results from numerous audit studies conducted in Britain, Europe and the US.

[9] Net discrimination, when expressed as a percentage, is defined as $(c - b) / a$, where c is the number of tests where the White individual was discriminated against, b is the number of tests in which the minority was discriminated against, and a is the number of usable tests. This formula is applied in Table I.

Table 1 A Sample of Results from Audit Studies Conducted in Britain, Europe and the US

Study	Location	Minority	Neither Invited	Usable Tests (1)	Equal Treatment (2)	Discrimination against minority (3) No	Discrimination against white (4) No	Net Discrimination (4) - (3) No	Net Discrimination [(4) - (3)]/(1) %
Daniel (1968)	All major regions of England	Asian/West Indian	10	30	3	27	0	27	90.0***
McIntosh and Smith (1974)	Birmingham (England)	Asian/West Indian	56	146	93	53	3	50	43.3***
	London (England)	Greek	25	32	29	3	0	3	9.0
Brown and Gay (1985)	Birmingham (England)	Asian/West Indian	32	68	48	18	2	16	24.0***
Cross et al (1990)	San Diego (US)	Hispanic	39	101	62	25	14	11	10.9*
Turner et al (1991)	Chicago (US)	Black	211	265	215	35	15	20	7.6**
Bendick et al (1991)	Washington (US)	Hispanic	99	183	137	46	0	46	25.1***
de Prada et al (1996)	Barcelona (Spain)	Moroccan	261	268	112	141	15	126	47.0***
Glodberg et al (1996)	Berlin and Rhine-Ruhr (Germany)	Turkish	158	175	142	33	0	33	18.9***
Smeeters and Nayer (1998)	Flanders and Wallonia (Belgium)	Moroccan	37	62	37	19	6	13	21.0***
Nunes and Seligman (1999)	San Francisco (US)	Black	0	45	12	25	8	17	37.8***

Source Riach and Rich (2002)
Note * significant at the 0.05 level; ** significant at the 0.01 level; *** significant at the 0.001 level

CRITIQUES OF THE AUDIT STUDY METHODOLOGY

The most natural criticism of the audit study methodology is that it is impossible to perfectly match two individuals regardless of the amount of coaching they may receive (Heckman and Siegelman, 1993). Consequently, researchers have gone to great lengths in an attempt to mitigate this problem. In addition to the methods identified above, individuals in a matched pair are typically coached on their demeanour to control for possible personality differences. Furthermore, the two are usually coached together to ensure that the manner in which they respond to questions is as similar as possible. When contacting or visiting employers, individuals are given an elaborate form to record all aspects of the interview which is then reviewed by the researcher before any data from the matched pair is captured. Finally, tests can be run to see whether a particular matched pair or individual exerts a statistically significant influence on the results of the study and is therefore worthy of exclusion.

Heckman and Siegelman (1993) and Heckman (1998) levy other criticisms on the audit approach. Their arguments will be discussed below.

Heckman and Sigelman (1993) argue that audit studies typically use overqualified college students to apply for entry-level jobs in low skilled occupations. While this may be true, although it certainly is not when actors or other members of society are recruited for the studies, it does not undermine the usefulness or relevance of the audit approach. If students have been adequately coached to minimise differences in their presentation styles and qualifications and one individual from a pair is selected over another then discrimination has taken place, regardless of the fact that the individuals may in reality be overqualified for the position.

Their concern with sampling only low skilled occupations is more justified because by doing so it is difficult to argue that the results of audit studies generalise to the economy at large. However, showing that discrimination takes place in low skilled occupations is a significant finding in itself because qualifications necessarily matter far less for these positions and thus a decision to hire, say, a White over a Black candidate cannot be justified by recourse to skill differences (which should have been accounted for by the audit approach anyway).

In a related point, Heckman (1998) argues that a major shortcoming of audit studies is that they do not focus on jobs which are acquired through networks and friends. While this is true, the assertion itself is specious. By their very nature audit studies cannot focus on this aspect of the labour market and they have never purported to do so. This does not undermine the validity of results from audit studies it merely highlights a purpose for which they were never designed.

Heckman and Siegelman (1993) argue that individuals who take part in audit studies can be primed to find discrimination where it may not exist. They cite instances where audit agencies have discussed the pervasiveness of discrimination in contemporary society before coaching matched pairs. This could conceivably motivate some individuals to prove the existence of discrimination by interviewing poorly. However one would expect this to be the exception rather than the norm particularly because an outlying individual would become immediately apparent when analysing the results of a study.

Heckman (1998) demonstrates that audit studies can find evidence of discrimination, equal treatment or reverse discrimination when in fact no discrimination is present. This argument relies on the notion that there are two components of an individual's productivity: the observed component (qualifications and presentation style, for example) which audit studies use to minimise any differences between individuals in a matched pair; and an unobserved component which is visible to firms but not to the designers of the audit study. Heckman (1998) argues that the implicit assumption behind audit studies is that the effect of unobserved characteristics averages out to zero across firms for the same audit pair. However, if the distribution of the unobserved component is different for two race groups then the audit method, which can only control observed productivity-linked characteristics, can produce spurious discrimination results. While the argument is logically consistent, it is regrettable that Heckman does not provide one example of a potential unobservable confounding variable. Moreover, Heckman's own assumption that the unobserved component of productivity is only visible to firms appears to be equally questionable to the implicit assumption behind audit studies.

In sum, audit studies provide a valuable alternative to regression based estimates of racial discrimination, despite the criticisms levelled on them. Riach and Rich (2002) survey the results from audit studies conducted in Britain, Europe and the United States from the 1960s. In Britain, for seven of the eight studies reviewed, net discrimination against Black applicants was found to be equal to or greater than 30 percent. In a study commissioned by the International Labour Office (ILO) which ran audits in the Netherlands, Belgium, Germany and Spain, significant discrimination was evident at the initial hiring stage. Focussing on discrimination at all stages in the hiring process showed that in one out of three observations, the minority job applicant would have been rejected for a job in any of the countries. For the US, studies run by the Urban Institute and the Fair Employment Council found net discrimination against Hispanics to be at least 25 percent in all cases and at least 10 percent for Blacks in all cases. Thus, audit studies have been helpful in highlighting the prevalence and persistence of racial discrimination.

CORRESPONDENCE STUDIES

Correspondence studies, first introduced by Jowell and Prescott-Clarke (1970), are based on the same rationale as audit studies but use written applications for jobs to test for discrimination in labour hiring at the initial stage of selection for interview. For these studies a matched pair of written job applications are sent into employers advertising vacancies. To prevent detection, the letters are not identical but they match two individuals of different races in terms of qualifications and work experience. To attenuate any bias that may arise from the style of the letters, the letters are alternated equally between the two race groups. Table II presents the results from correspondence studies conducted in Britain, Europe and Australia.

Table II. A Sample of Results from Correspondence Studies Conducted in Britain, Europe and Australia

Study	Location	Minority	Neither Invited	Usable Tests (1)	Equal Treatment (2)	Discrimination against minority (3) No	Discrimination against white (4) No	Net Discrimination (4) - (3) No.	Net Discrimination [(4) - (3)]/(1) %
Jowell and Prescott-Clarke	Birmingham (England)	Asian	6	26	11	14	1	13	50 0***
	Birmingham (England)	West Indian	5	27	22	4	1	3	11 0
	Leicester (England)	Australian	5	27	26	1	0	1	4 0
	London (England)	Cypriot	6	26	21	4	1	3	11 0
McIntosh and Smith (1974)	London (England)	Asian/West Indian		234	136	84	14	70	30 0***
	London (England)	Italian		71	52	13	6	7	10 0
Hubbuck and Carter (1980)	Nottingham (England)	Asian	58	103	48	49	6	43	42 0***
	Nottingham (England)	West Indian	58	103	49	49	5	44	43 0***
Brown and Gay (1985)	London and Manchester (England)	Asian/West Indian	199	267	144	102	21	81	30 0***
Bovenkerk et al (1995)	Utrecht (Netherlands)	Surinamese/m	133	157	79	53	25	28	17 8***
	Utrecht (Netherlands)	Surinamese/f	38	78	52	18	8	10	12 8*
Riach and Rich (1991)	Melbourne (Australia)	Vietnamese	362	157	96	49	9	43	27 4***
	Melbourne (Australia)	Greek	292	170	135	25	10	15	8 8**

Source: Riach and Rich (2002)

Note: * significant at the 0 05 level, ** significant at the 0 01 level, *** significant at the 0 001 level

The correspondence approach has many attractive features: it gives researchers precise control over the content of the applications; it mitigates any bias that may arise from letter type by alternating the letters equally between the race groups; it is not constrained by job-type or skill level and has been applied to the full spectrum of jobs in an economy; the letters can be adapted to simultaneously investigate the impact of other variables like work experience; it negates the problem of priming of individuals in audit pairs; and it allows researchers to demonstrate the controlled and objective nature of the technique to the reader.

A possible complication with the procedure may arise when names are used to signal race, gender or ethnicity because by doing so one relies on the assumption that employers make the appropriate distinctions based on an imperfect signal. This problem is easily surmounted though by adding a race or sex component to the application or listing interests which are race or gender specific (Adam, 1981). Another shortcoming of the approach is that it only focuses on discrimination at the initial stage in the hiring process because invitations to interview are always declined. Nevertheless, the correspondence technique provides a valuable alternative to audit studies where more control is rested in the hands of the researcher. A correspondence test conducted in Australia which paired an Australian with either a Vietnamese or a Greek individual found levels of net discrimination of 27.4 percent and 8.8 percent for the two minority groups, respectively (Riach and Rich, 1991). Studies in Britain by Jowell and Prescott-Clarke (1970), Hubbuck and Carter (1980), and Brown and Gay (1985) found levels of net discrimination against minority groups in excess of 30 percent. Finally, Bertrand and Mullainathan (2002) conducted a correspondence study in the US and found that resumes with White names received 50 percent more callbacks than resumes with Black names. In addition, resumes of higher quality markedly increased callbacks for Whites but had a far smaller impact on callbacks for Blacks.

DIRECT EVIDENCE OF RACIAL DISCRIMINATION

Direct evidence of persistent racial discrimination is provided by the verdicts of employment discrimination lawsuits. Darity and Mason (1998) sample a number of recent cases which found in favour of the plaintiffs and awarded substantial sums to those who suffered from racial discrimination in employment, layoff policies, tenure, promotion, work environment, training and occupational segregation. Interestingly, the Oaxaca-Blinder decomposition has been increasingly used to determine the outcome of these cases in the US (Ashenfelter and Oaxaca, 1987). Although a particular finding of racial discrimination in a company or organisation says little about discrimination in general it does provide direct evidence that discrimination has occurred, despite legislation prohibiting it.

Given the criticisms levelled on many of the empirical methodologies outlined above, laboratory experiments have increasingly been used by psychologists and economists to investigate racial discrimination[10]. Table III presents a sample of the results from these studies.

EXPERIMENTAL APPROACHES

An interesting set of psychological experiments, which fall under the rubric of the minimal group paradigm (Tajfel, 1970; Turner, 1978), focus on the effect of group affiliation on the actions of individuals towards members of their own group and members of other groups. In a typical experiment, subjects are randomly[11] sorted into one of two groups and then asked to split money between an in-group member and an out-group member. Despite the arbitrary nature of group assignment and the limited amount of time that individuals are associated with their group, subjects still display a significant in-group bias by giving more money to individuals in their group than individuals in the other group. Although experimental treatments differ, the overwhelming finding in this line of research is that individuals rapidly form an in-group bias, which suggests that discrimination can easily arise and persist despite the lack of inherent differences between the individuals in these experiments (Vaughan, Tajfel and Williamson, 1981; Billig and Tajfel, 1973; Turner, 1978; Turner and Brown, 1978).

Experimental research by the social psychologist Claude Steele reveals that "stereotype threat" may negatively affect the performance of individuals on a standardised test. Stereotype threat is defined as a situation where negative discriminatory stereotypes affect the actions and ability of an individual who belongs to the group for which the stereotype exists or is made salient. Steele (1997) and Steele and Aronson (1995, 1998) set out to test for the impact of stereotype threat

[10] For an overview of experimental evidence on discrimination from both psychology and economics consult Anderson, Fryer and Holt (2005).

[11] Subjects often take a quiz or perform some other test to, supposedly, sort them into groups based on their responses. In reality, the experimenter usually assigns group membership randomly.

with undergraduates at Stanford University. Black and White subjects were randomly assigned to two treatment groups. In one treatment, Black and White students were asked to complete a standardised test, but one which was considered more threatening to Black students (in that they were told the test was indicative of verbal ability) because their answers could confirm a negative racial stereotype. In the other treatment, race was made salient by asking the individuals to check a race box prior to the test. The results show that raising individual awareness of race, significantly reduced the performance of Black students. This result is pertinent to the discussion on discrimination because it shows how stereotypes can become self-perpetuating.

Table III: Results from Experimental Studies of Racial Discrimination

Study	Experimental Approach	Results
Steele and Aronson (1995)	Black and White US students complete a standardised test. First treatment: individuals do not indicate race. Second treatment: individuals indicate race.	Making race salient significantly reduced the performance of black students.
Hoff and Pandey (2003)	Indian school children perform maze-solving exercises. First treatment: caste identity not revealed. Second treatment: caste identity revealed.	Publicly revealing caste reduces performance of low caste subjects.
Fershtman and Gneezy (2001)	Israeli students take part in trust, ultimatum and dictator games where ethnic identity is revealed using typical Ashkenazic and Eastern last names.	A systematic mistrust of men of Eastern origin is observed. This discrimination is an entirely male phenomenon but is not based on a 'taste' for discrimination.
Davis (1987)	Test of statistical discrimination. Simulate a hiring process where applicants are disproportionately drawn from the majority population. First treatment: subjects view the draws and then decide what proportion of draws come from each population. Second treatment: subjects receive printed list of maximum draws from each population and then asked to choose the proportion.	First treatment: subjects selected 60% of the draws from the 'majority' population. Second treatment: subjects selected 70% of the draws from the 'majority' population.
Anderson and Haupert (1999)	Test of statistical discrimination. Subjects given 10 yellow and 10 green index cards (to represent two types of workers) with productivity numbers on the back of each card. Subjects told to select the 8 most productive workers from the set. To view the productivity numbers, subjects had to pay an "interview cost". Subjects were told that one group was less productive than the other.	Subjects tended to select more workers from the high productivity group (practised statistical discrimination). When "interview cost" was lowered, discrimination against the less productive group fell.
Fryer, Goeree and Holt (2001)	Test of statistical discrimination. Subjects were either employers or workers. Workers: 50% green, 50% Purple. In each round, workers viewed a randomly determined investment cost and decided whether to invest or not. Employers then observed a test outcome (red or blue), with likelihood of investment greater if the outcome was blue. Employers then decided whether or not to hire a worker given their colour and test outcome but without knowing whether they had invested or not. In the first 10 rounds, Green workers face a lower cost of investment. Final 50 rounds, both workers faced same cost of investment.	After 60 rounds of the game, Greens had invested more and were hired more than Purples. Thus an initial assymetry between the groups generated a feedback effect on investment decisions. 4 out of 6 employers used colour-based hiring strategies. Given this statistical discrimination, Purples chose to invest less which confirmed the expectations of employers.

Source: compiled by author

Hoff and Pandey (2003) conducted maze-solving experiments with school children in India where caste identity was made salient. They found that publicly revealing caste identity lowered the motivation of low caste subjects and attributed this to the fact that low caste subjects expected their efforts to be poorly rewarded. This result echoes those of Claude Steele and shows how negative perceptions can affect individuals' performance, thereby creating a self-fulfilling prophecy.

Economists have devised a number of interesting experiments to analyse discrimination. Fershtman and Gneezy[12] (2001) used three experiments – the trust[13], dictator[14] and ultimatum[15] games – to analyse ethnic discrimination among a sample of Israeli undergraduates. Subjects were recruited with typical ethnic last names, which served as the signal of ethnic identity in the experiments, thereby allowing individuals to determine whether their partners were of Ashkenazic or Eastern origin. In the trust game experiment, individuals transferred significantly lower amounts of money to players of Eastern origin than to players of Ashkenazic origin. Interestingly, this systematic mistrust of players of Eastern origin was evidenced amongst both Ashkenazic and Eastern players, the latter therefore choosing to discriminate against their own group. In addition, the results were driven purely by male players; there was no evidence of discrimination between women.

To determine whether the mistrust displayed in the trust game was the result of a 'taste' for discrimination, Fershtman and Gneezy (2001) then conducted a dictator game[16]. Unlike the trust game, individuals sent similar amounts to players of Ashkenazic and Eastern origin. The scholars therefore conclude that the results from

---

[12] Fershtman, Gneezy and Verboven (2005) develop another experimental test of discrimination using the trust game. As this methodology forms the basis of the approach adopted in this paper, it will be discussed in detail in Section VI.

[13] In a trust game, Player A is given an endowment of money and is asked how much of it, if anything, he wants to transfer to Player B. Whatever Player A sends is automatically tripled and then Player B must decide how much to return to Player A. Player B's decision concludes the game.

[14] A dictator game is a one-stage game where Player A is given an endowment of money by the experimenter and is asked to decide on a division of this money between himself and Player B. Player A's decision concludes the experiment and thus player B has no strategic role in the game.

[15] An ultimatum game requires that Player A propose a split of his endowment between himself and Player B. Player B then decides whether to accept or reject the proposal. If Player B accepts the proposal, the split is implemented. If, instead, Player B rejects the proposal, both players receive nothing.

[16] Note that the experimenter automatically tripled the amount sent by Player A to Player B so as to make the results easily comparable to those from the trust game.

the trust game experiment reflect an ethnic stereotype of low expected returns from Eastern players rather than a 'taste' for discrimination.

Finally, Fershtman and Gneezy (2001) ran ultimatum games with the experimental subjects to focus on the players' attitudes to fairness. The common result from ultimatum game experiments is that Player A typically transfers a non-negligible amount to Player B who occasionally rejects low offers. Player A's transfer therefore takes into account two concerns: the first is to achieve a more equitable division of the funds and the second is to avoid the rejection of their offer by Player B who may regard it as 'unfair'. Interestingly, the pattern of results in the trust game was reversed in the ultimatum game. Specifically, players of Eastern origin received significantly larger transfers than players of Ashkenazic origin. The scholars explain this finding by reference to a common Israeli stereotype that people of Eastern origin tend to be more driven by a sense of 'honour' and respond in kind when treated unfairly. Thus Player A decided to transfer more to Eastern-origin Player Bs for fear of having his offer rejected.

Given the importance of statistical discrimination models and the difficulty in interrogating them using regression techniques, experiments have been designed to serve this purpose.

Davis (1987) proposed the first experiment on this topic to investigate how biased perceptions are formed in the laboratory by focussing on the relative sizes of "majority" and "minority" populations. The idea was to create an analogue to a hiring process where applicants are drawn disproportionately from the majority population. If employers tend to focus on the best candidates – the one's with the best university transcripts, say - drawn from each population then a bias in favour of the larger population may arise and this was what Davis sought out to test. To do so he simulated draws from two identical normal distributions of monetary prize values but assigned a probability of 80 percent to a draw from the "majority" distribution. With more observations drawn from the "majority" population it was more likely to generate a higher maximum value than the "minority" population. Experimental subjects were shown the random realisations of draws from the identical normal distributions and were then asked to decide what proportion of draws would come

from each population. In the baseline treatment, subjects selected 60 percent of the draws from the "majority" distribution because it was perceived as better on average. In another treatment, where subjects were given a printed sheet listing the maximum draw for each period for each population, subjects selected 70 percent of the draws from the "majority" population. Thus, interestingly, a bias in favour of the "majority" population emerged despite the fact that both populations were identical.

Another test of statistical discrimination was conducted by Anderson and Haupert (1999). Subjects were given yellow and green index cards to identify two different types of workers. On the back of each card was a productivity number associated with the worker represented by that card. Subjects were given ten green and ten yellow cards and were asked to play the role of employer whose job it was to hire the eight most productive workers from the set. However, to view the productivity of a worker, subjects had to pay an "interview cost". When subjects were told that the productivity of one group was lower than the other, subjects tended to 'hire' more workers from the high productivity group in the absence of interviews. By doing so, subjects relied on population averages when formulating their hiring decisions and thus practised statistical discrimination. Interestingly, when the interview cost was reduced, discrimination against the less productive group diminished because subjects could search for the most productive workers regardless of colour.

Perhaps the most comprehensive test of statistical discrimination was conducted by Fryer, Goeree and Holt (2001) who used endogenously determined worker productivities in their experimental design. Subjects were either employers or workers, with half of the workers randomly assigned as Green and the other half as Purple. In each round, workers viewed a randomly determined investment cost and decided whether to invest or not. Employers then observed a test outcome (red or blue), with the probability of investment greater if the outcome was blue. Finally, the employers decided whether or not to hire a worker given their colour and test outcome but without knowing whether they had invested or not.

In the first ten rounds of the game, investment costs for the two groups were drawn from different distributions. Specifically, Green workers were drawing from a uniform distribution on [$0.00, $0.50] and Purple workers were drawing from a

uniform distribution on [$0.50, $1,00]. This asymmetry was removed for the final fifty rounds of the experiment, with both groups drawing from a uniform distribution on [$0.00, $1.00]. Given lower investment costs in the first ten rounds, Greens invested more and were hired more than Purples. After ten rounds though, investment became relatively more attractive to Purples, and less so for Greens, so investment increased markedly for Purples and declined for Greens. Despite the surge in Purple investment, hiring rates did not respond until 10 periods later because employers could not observe the investment decisions of workers who were not hired. Although hiring rates began to increase for Purple workers, they lagged behind Green workers who were incentivised to invest given their greater hiring rates. By the end of the experiment, Greens were investing and being hired more than Purples which highlights how an initial asymmetry between the groups can generate a feedback effect on investment decisions. An analysis of the employer decision sequences showed that four out of six employers used colour-based strategies in hiring. Owing to the statistical discrimination that they faced, Purples chose to invest less which confirmed the expectations of employers.

Section IV has focussed on empirical attempts to analyse discrimination. Section V will discuss how these methodologies have been applied to the South African labour market.

V. RACIAL DISCRIMINATION IN SOUTH AFRICA

A number of analyses of the extent of racial discrimination in the South African labour market have been conducted. To our knowledge, all of these studies have used Oaxaca-Blinder decompositions on labour market survey data to investigate discrimination; no audit, correspondence or experimental techniques have been applied. Rather than provide an exhaustive discussion on each study, we will briefly highlight the results from some of the earlier papers before focussing on some of the more recent and influential papers in the literature. Table IV provides an overview of the studies conducted in South Africa.

Table IV: Results from Racial Discrimination Studies in South Africa

Study	Datasets Used	Technique	Results
Knight and McGrath (1987)	Private Survey	O-B wage decomposition	Discrimination against Blacks = 21%. But discrimination declined between 1976 and 1985.
Moll (1992)	1970 PC 1980 PC (Revised versions)	O-B wage and occupation decompositions	Wage discrimination against Coloureds declined from 59% - 57%.
Moll (1995a)	1980 PC 1993 PSLSD	O-B wage and occupation decompositions	Discrimination against Blacks declined from 75% - 44%.
Treiman et al (1996)	1980 PC 1991 PC	O-B wage decomposition	Discrimination decreased for Coloureds, Blacks and Asians
Frijters (1999)	Private survey	Probability of employment function with a race dummy	Indians significantly more likely to be hired than blacks.
Hinks (1999)	1980 PC 1994 OHS	O-B multilateral wage decomposition	Discrimination declined: Blacks 12.3% - 5.3%; Coloureds 9.3% - 3.7%, Asians 7.1% - 2.7%.
Sherer (2000)	1995 OHS	O-B wage decomposition	Discrimination accounts for 12% - 15% of the wage gap between Whites and Asians, 15% - 22% for Coloureds and 10% - 22% for Blacks.
Erichsen and Wakeford (2001)	1993 SALDRU Household Survey 1995 OHS	O-B multilateral wage decomposition	Discrimination only declined for Coloured males and White females.
Kingdon and Knight (2001)	1994 OHS	O-B employment decomposition	Probability of unemployment that is due to discrimination is 8.3, 6.5 and 3.2 percent for Blacks, Coloureds and Asians, respectively
Allanson, Atkins and Hinks (2002)	1980 PC 1995 OHS 1997 OHS	O-B multilateral wage decomposition	Discrimination against Blacks, Coloureds and Asians decreased between 1980 and 1997.
Rospabe (2002)	1993 PSLSD 1999 OHS	O-B labour force participation, occupaiton and wage decompositions	Discrimination in labour force participation between Whites and Blacks declined: 33% - 30%. Discrimination between Whites and Blacks increased: occupational 32% - 37%; wage 23% - 28.5%.
Chamberlain and van der Berg (2002)	1993 PSLSD 1995 OHS	O-B wage decomposition with controls for educational quality	Discrimination component of the wage gap declined from 42% - 24% with increased levels of adjustment for educational quality
Brookes and Hinks (2003)	1995 OHS 1999 OHS 2000 SLFS 2001 SLFS 2002 SLFS	O-B employment decomposition	Employer nepotism in favour of Whites rose from 9% in 1995 to 14.9% in 2002. Employment discrimination against Blacks remained stable at 2% - 3%.

Table IV (*Continued*): Results from Racial Discrimination Studies in South Africa

Study	Datasets Used	Technique	Results
Burger and Jafta (2004)	1995 OHS - 1999 OHS 2000 FLFS, SLFS - 2004 FLFS, SLFS	O-B employment, occupaiton and wage decompositions. Brown, Moon and Zoloth (BMZ) decomposition. John, Murphy and Pierce (JMP) decomposition	O-B results: employment discrimination remained stable; occupational discrimination rose for Blacks, remained stable for Coloureds and Asians; wage discrimination remained relatively stable. BMZ results: differences in wages within occupational categories account for the largest part of the racial wage gap. JMP results: discrimination declined at the 95th percentile of the wage distribution

Source: compiled by author
Note:
PC: Population Census
OHS: October Household Survey
PSLSD: Project for Statistics on Living Standards and Development
SALDRU: South African Labour and Development Research Unit
SLFS: September Labour Force Survey
FLFS: February Labour Force Survey

One of the earliest studies of racial discrimination in South Africa was conducted by Knight and McGrath (1987). The scholars employed a private survey and found that discrimination against Blacks accounted for 21 percent of the racial wage gap. However, discrimination decreased between 1976 and 1985. Another notable finding was that occupational discrimination was an important component of racial wage differentials.

Moll (1992) used revised versions of the 1970 and 1980 Population Censuses to analyse wage differentials between Whites and Coloureds. With the logarithm of monthly earnings as his dependent variable, Moll (1992) found that wage discrimination against Coloureds declined from 59 percent of the racial wage differential to 57 percent. Similarly, Moll (1995a) who made use of the 1980 Population Census and the 1993 Project for Statistics on Living Standards and Development (PSLSD) dataset found that discrimination against Blacks decreased from 75 percent of the racial wage differential in 1980 to 44 percent in 1993.

Treiman et al. (1996) employed the 1980 and 1991 Population Censuses to decompose the wage differential for all three non-White race groups, finding that discrimination decreased for Coloureds, Blacks and Asians over the period. The proportion of the racial wage gap attributed to discrimination declined from 64-66

percent to 48-59 percent for Blacks, from 44-64 percent to 38-49 percent for Coloureds and from 65-78 percent to 64-72 percent for Asians[17].

Hinks (1999) employed a 'pooled' wage structure to investigate the trend in racial discrimination between 1980 and 1994 in South Africa. To do so, he used the 1980 Population Census and the 1994 October Household Survey (OHS). His results show that discrimination against Blacks, as a proportion of White earnings, declined from 12.3 percent to 5.3 percent. For Coloureds and Whites, the discrimination differential fell from 9.3 percent to 3.7 percent. Finally, the discrimination differential declined from 7.1 percent to 2.7 percent for Whites and Asians.

Frijters (1999) used a detailed private dataset from a large clothing manufacturer in South Africa to analyse differences in the probability of employment for Blacks and Indians. Controlling for the applicants score on a test of nimbleness, Frijters found that Indians were significantly more likely to be hired than Blacks. Given that Blacks employed within the firm had lower levels of productivity than Indians, Frijters attributes the difference in employment probability to statistical discrimination on the part of employers based on the lower expected productivity of Black workers.

Sherer (2000) adopted the approach of Treiman et al. (1996) when analysing the 1995 OHS. The results show that discrimination accounts for 12-15 percent of the wage gap between Whites and Asians. The equivalent figures for Whites and Coloureds is 15-26 percent and for Whites and Blacks is 10-22 percent.

In contrast to the previous results, Erichsen and Wakeford (2001) do not find declining levels of discrimination for all race groups when analysing the 1993 South African Labour and Development Research Unit (SALDRU) Household Survey and the 1995 OHS. Instead they find that discrimination remained relatively constant for White, Black and Asian males. Only Coloured males experienced declining levels of discrimination between 1993 and 1995. Similarly, discrimination remained relatively

[17] Recall that when applying the O-B methodology a decision has to be made about which wage structure to use as the non-discriminatory wage structure. Treiman et al. (1996) used both the White and respective non-White wage structures in their analyses, hence the bands reported.

constant for Black, Coloured and Asian females with a slight decline in the discrimination coefficient for White females.

Kingdon and Knight (2001) analyse racial discrimination in the probability of unemployment with the 1994 OHS. Using the dichotomous adaptation of the Oaxaca-Blinder decomposition they find that, relative to Whites, Blacks are discriminated against the most, followed by Coloureds and then Asians. Specifically, Kingdon and Knight (2001) show that the probability of unemployment that is due to discrimination is 8.3, 6.5 and 3.2 percent for Blacks, Coloureds and Asians, respectively.

Allanson, Atkins and Hinks (2002) used a multilateral decomposition of wage differentials to determine whether a racial hierarchy in wages and racial discrimination existed in South Africa in 1994. Their results show that such a hierarchy exists and that discrimination against Blacks accounted for 29 percent of the discrepancy in wages between Whites and Blacks. For Coloureds and Whites, discrimination accounted for 21 percent of the earnings gap whereas for Asians and Whites 56 percent of the wage gap was attributable to discrimination. Interestingly Allanson et al. (2002) found that White overpayment was the primary cause of the differentials rather than non-White underpayment.

Brookes and Hinks (2003) analyse the racial employment gap in South Africa using the 1995 and 1999 OHS and the 2000, 2001 and 2002 September Labour Force Survey (SLFS). They find that employer discrimination in favour of Whites (nepotistic discrimination) increased from 9 percent in 1995 to 14.9 percent in 2002. Interestingly, employer discrimination against Blacks remained relatively constant at 2-3 percent over the period under study.

With the results of the preceding studies as an overview of the research into racial discrimination in South Africa, we now discuss the methodology and results of three papers by Rospabe (2002), Chamberlain and van der Berg (2002) and Burger and Jafta (2004). These papers deserve more detailed discussion because of the empirical methodologies adopted, the questions that they seek to answer and their comprehensive scope.

Rospabe (2002) analyses the evolution of racial discrimination in labour force participation, occupational attainment and earnings using the 1993 PSLSD and the 1999 OHS. Thus, her study is particularly interesting because it investigates three distinct forms of labour market discrimination.

To analyse discrimination in labour force participation, Rospabe uses the dichotomous adaptation of the Oaxaca-Blinder decomposition. She finds a moderate decrease in the racial gap in labour force participation between 1993 and 1999. Two-thirds of the higher White incidence of labour force participation, relative to Blacks, can be attributed to observable employment-enhancing characteristics[18]. Thus, one-third of this racial gap in outcomes is the result of racial discrimination, although omission of variables necessarily implies that this estimate is biased. Nevertheless, the unexplained component of the difference in labour force participation between 1993 and 1999 declined from 33 percent to 30 percent, indicating a modest reduction in discrimination.

To analyse discrimination in occupational attainment, Rospabe (2002) once again makes use of the dichotomous adaptation of the Oaxaca-Blinder decomposition and sets her dependent variable equal to 1 if the individual holds a skilled job (managers, professionals, semi-professionals and technicians) and 0 otherwise. She finds that the racial gap in skilled jobs between Whites and Blacks is on the order of 40 percent and remains constant over the period, despite a higher proportion of Blacks employed in skilled jobs in 1999. Of this gap, 68 percent and 63 percent can be explained by observable productivity-enhancing characteristics in 1993 and 1999, respectively. Consequently, the unexplained component of this disparity in outcomes - which can be attributed to occupational discrimination - increased by 5 percent over the period.

Finally, Rospabe (2002) analyses wage discrimination between Whites and Blacks. Despite a decline in the earnings differential between 1993 and 1999, the unexplained component of the racial gap in wages rises from 23 percent to 28.5 percent over the

[18] However, it is important to note that differences in observable employment-enhancing characteristics between Whites and blacks may also stem from pre-labour market discrimination in the form of access to, and quality of, education.

period. Thus, in contrast to the bulk of results reported earlier, Rospabe finds increasing levels of wage discrimination against Blacks in the post-Apartheid period.

The rationale behind Chamberlain and van der Berg's (2002) paper is that controlling for the quality of education in a wage regression should provide better estimates of the extent of racial wage discrimination in South Africa. However, most datasets do not provide information on the quality of education received. To circumvent this problem, Chamberlain and van der Berg (2002) employ the 1993 PSLSD which includes scores on literacy and numeracy tests. These scores allow the authors to compute the number of years of *effective* schooling that each individual receives based on the assumption that *effective* schooling accumulates on a continuous and linear scale to the observable variable "number of school years completed". Given that the 1995 OHS does not include literacy and numeracy components, but does include the necessary information for calculating an earnings function, the scholars then had to obtain predicted test scores for the 1995 OHS using an instrumental variable obtained from a regression on the 1993 PSLSD. With a measure of education that includes a quality component, the scholars could expect to obtain better estimates of racial discrimination from the 1995 OHS.

However, another potential problem with standard wage regressions is that they suffer from sample selection bias because employed individuals are not a random sample from the population – as discussed in Section III. Consequently, Chamberlain and van der Berg (2002) model the earnings function in three separate and sequential stages: they first model labour force participation, then the probability of employment and finally the eventual earnings of those employed. One of the attractive features of this approach is that it allows one to include explanatory variables which are appropriate for each stage, thereby leading to a better specified model.

This ambitious and somewhat complicated approach yielded interesting results. First, the decision to model the earnings function in three stages was vindicated by the finding that sample selection bias was a relevant problem. Second, the selective use of explanatory variables for the three stages provided a better model fit than a single equation regression incorporating all potential explanatory variables. Finally, the estimates of racial wage discrimination were attenuated by incorporating the measure

of educational quality. Specifically, the discrimination component of the wage gap declined from 42 percent to 24 percent with increased levels of adjustment for educational quality. This finding suggests that pre-labour market discrimination accounts for a large proportion of the racial wage gap estimate, which is typically attributed to labour market discrimination. Nevertheless, the unexplained component of the racial wage gap is still significant, implying that labour market discrimination is still practised in South Africa.

Burger and Jafta (2004) use three decomposition techniques – Oaxaca-Blinder (1973), Brown, Moon and Zoloth (1980) and Juhn, Murphy and Pierce (1991, 1993) – to analyse racial discrimination in South Africa between 1995 and 2004. Their data is derived from the annual October Household Surveys from 1995 to 1999 and the biannual Labour Force Surveys from 2000 to 2004, together comprising 15 nationally representative surveys. The paper uses the Oaxaca-Blinder decomposition, with the procedure pioneered by Heckman (1978) to control for sample selection bias, to investigate racial discrimination in employment, occupational attainment and wages between all race groups in South Africa. The Brown, Moon and Zoloth (1980) decomposition is then used to endogenise occupational selection and in so doing to further distinguish between inter-occupational and intra-occupational discrimination. Finally, the scholars use the Juhn, Murhpy and Pierce (1991, 1993) decomposition to decompose the racial wage gap at different points in the wage distribution. This study is particularly notable because of the decomposition techniques it uses, the large number of surveys employed and the different types of discrimination it explores.

With regards to employment, results show that the Black-White employment gap increased markedly between 1995 and 2000 but then stabilised. Comparisons across race groups show that the employment gap between Whites and Blacks was far larger than that between Whites and Coloureds and Whites and Asians. Similarly the unexplained component of the racial wage gap, which can be attributed to discrimination, was largest in Black-White comparisons but was non-negligible for other race groups. Interestingly, discrimination remained relatively stable over the period which suggests that affirmative action has thus far failed to substantially affect racial disparities in employment.

In terms of occupational attainment, a similar racial hierarchy is evident: differences in the probability of obtaining a high-skilled job are greatest in White-Black comparisons, followed by White-Coloured and White-Asian comparisons. The occupational gap between Whites and Blacks rose until 1998 but then stabilised while the gap between Whites and Coloureds and Whites and Asians remained relatively stable over the period. The unexplained component of the occupational gap displays a similar ranking: highest for Blacks, lower for Coloureds and negligible for Asians. Discrimination against Blacks rose over the period but remained stable for Coloureds and Asians suggesting, once again, that affirmative action has done little to alter occupational discrimination.

Burger and Jafta (2004) then analyse the racial wage gap and find it is largest for Blacks, then Coloureds and then Asians, relative to Whites. Both the explained and unexplained components of this gap remain stable between 1995 and 2004 for all race groups but the unexplained component is largest for Blacks. Disaggregating the results further, Burger and Jafta find that education's share in the total wage gap increased substantially over the period but this was mostly due to its rising share of the unexplained component. The effect of "pure discrimination" reversed from being 14 percent in favour of Whites to 7 percent in favour of Blacks, although neither of these magnitudes were statistically significant. The results imply that outright discrimination against Blacks potentially decreased post-1994. However large skill differences between Whites and Blacks are still evident and any hopes of narrowing the racial wage gap will rest on remedying differences in the quality of education that Blacks and Whites receive.

The Brown, Moon and Zoloth (1980) decomposition is then used to endogenise occupational selection in the earnings function and thus further explore the racial wage gap between Whites and Blacks. The findings show that intra-occupational productivity differences account for the largest share of the wage gap between 1995 and 2004, followed by the unexplained intra-occupational component, inter-occupational productivity-linked differences and the unexplained inter-occupational component. Thus, differences in wages within occupational categories account for the largest part of the racial wage gap. The scholars note that the explained: unexplained shares ratio is larger between rather than within occupations over the period. They

conjecture that employers may use race to the benefit of Blacks when hiring into highly-skilled positions but that they may also discriminate against them through paying lower wages within these occupational categories.

Finally, the Juhn, Murphy and Pierce (1991, 1993) decomposition is used to analyse racial differences in wages at different points in the wage distribution. The rationale for using this technique is that affirmative action may have only affected the top end of the wage distribution and thus comparisons which only focus on the average wages of Black and White workers may obscure this trend. Interestingly, Burger and Jafta (2004) find that the racial wage gap has declined at the 75th, 90th and 95th percentiles although a marked decline in the unexplained component is only evident at the 95th percentile. This decline in the unexplained component occurred in 1999, the year after the passing of the Employment Equity Act, which implies that affirmative action may have played a role in reducing discrimination at the top end of the wage distribution.

The preceding discussion has provided an overview of research into racial discrimination in South Africa. As is evident, a plethora of contrasting results have been found so it is difficult to state unequivocally whether discrimination has decreased, remained stable or increased in the post-Apartheid period. Perhaps the biggest difficulty in making a clear statement on discrimination is that decompositions applied to survey data necessarily suffer from omitted variable bias. As the paper by Chamberlain and van der Berg (2002) shows, accounting for quality of education, albeit imperfectly, greatly reduced the estimate of racial discrimination. In addition, differences in survey design and sampling confound comparisons across surveys and the use of different datasets and empirical methodologies make it difficult to compare the results from one study to another. This paper therefore adopts an experimental approach to get a direct, behavioural measure of discrimination in contemporary South Africa. This is not to say that our methodology is necessarily better or more credible than those employed in other studies. Our goal is merely to determine whether we find comparable results.

The experimental method adopted in this paper will make use of the trust game of Berg, Dickhaut and McCabe (1995). Given that the preceding discussion has focussed solely on labour market discrimination, a comment on the similarities between labour

markets and the stylised trust game is in order. In a trust game, the proposer must determine whether to engage in exchange with his partner and at what level. Thus the proposer's decision is plagued by an information asymmetry regarding the trustworthiness of his partner. In a labour market, employers must decide whether to employ job candidates and if so, what wages to offer them. Thus employers are confronted with asymmetric information when they select their staff because they cannot know with certainty how productive their employees will be. In this way the employer's decision of whether to hire a candidate and what salary to pay him is akin to a proposer's decision of whether to engage in exchange and at what level. Thus, like a trust game, a labour market is characterised by exchange interactions that are fraught with information asymmetries. Granted, the analogy is not perfect but there are some similarities. As Arrow (1972) asserts, "virtually every commercial transaction has within itself an element of trust". A trust game allows one to analyse social exchange between different individuals and our goal is to discern whether we can find discrimination in these social interactions, much like the O-B methodology seeks to uncover discrimination in labour market interactions.

VI. AN EXPERIMENTAL APPROACH

Fershtman, Gneezy and Verboven (2005) propose an experimental test for discrimination based on Becker's (1971) distinctions between discrimination and nepotism. Recall that discrimination refers to the *disutility* an individual experiences by associating with certain individuals whereas nepotism refers to the *utility* an individual enjoys from associating with particular people. Thus individuals who have discriminatory preferences will be willing to pay to avoid contact with members of certain groups whereas those with nepotistic preferences will be willing to pay to associate with these groups. Despite the important differences between these forms of discrimination (positive and negative), these distinctions have hardly been used because nepotism and discrimination are empirically indistinguishable (Becker, 1971: 160).

However, Fershtman et al. (2005) argue that the two forms of discrimination can be distinguished by focussing on observed behaviour in an experimental setting. To do so, one must compare the behaviour of individuals towards people with clear group affiliation and the behaviour of individuals towards people with no clear group affiliation (anonymous individuals). Suppose there are two types of individuals in a society, *B* and *W*. When individuals from group *B* treat members of their own group more favourably than members of group *W* but treat anonymous individuals in the same way as they treat members of group *B*, this is evidence of discrimination against members of group *W*. Thus individuals from group *W* are only discriminated against when they are identified as such. Alternatively, if individuals from group *B* treat anonymous individuals in the same way as they treat members of group *W*, then discrimination in favour (nepotism) of group *B* has occurred. Thus, individuals treat members of group *B* more favourably only when they can be identified. Clearly these two cases represent the polar extremes of pure discrimination and nepotism and numerous intermediate cases must exist. However, in the context of the following experiment, one can only determine whether the behaviour is closer to nepotism than discrimination, or vice-versa. Another important caveat is that these definitions based on observed behaviour implicitly assume that individuals will display an in-group bias. If instead, individuals from group *B* treated members of their own group less favourably than members of group *W* and anonymous individuals in the same way as

members of group *B*, then this should be taken as evidence of nepotism towards members of group *W*. In this case, members of group *B* display a nepotistic out-group bias.

It should be noted that the distinction between nepotism and discrimination has important policy implications. Widespread public support for anonymity rules, which prohibit disclosure of group affiliation, has led economists to question whether such rules will be both equity and efficiency enhancing or whether they will be subject to an equity-efficiency trade-off. Interestingly, the answer depends on the type of discrimination that is practised. Consider, for example, a market where higher levels of interpersonal trust and cooperation yield larger overall payoffs. If this market is characterised by discrimination then players will trust anonymous players as if they were members of their own group, thereby implying that the use of an anonymity rule will be both equity and efficiency enhancing. If, instead, the market is characterised by nepotism, then the use of an anonymity rule may reduce trust and cooperation, thereby yielding greater equity but less efficiency. Thus the form of discrimination that is practised in an economy has important policy implications.

To experimentally test for discrimination and nepotism, Fershtman et al. (2005) make use of the trust game pioneered by Berg, Dickhaut and McCabe (1995). The trust game involves two players, *A* and *B*. At the start of the game, Player *A* (the proposer) is given an endowment of money which he is asked to allocate between himself and player *B* (the trustee)[19]. Any money sent to player *B* is automatically tripled. Player *B* is then asked how much of the tripled amount he wants to send back to player *A*. Player *B*'s decision concludes the game. Clearly the efficient outcome, that which maximises the total pie, is when player *A* transfers his full endowment to player *B* because the amount sent is tripled. However, the sub-game perfect equilibrium is for player *A* to transfer nothing to player *B*. Camerer (2002) reports that experimental subjects typically transfer close to 50 percent of their endowment and their transfers are reciprocated on average. This strategic interaction is referred to as the trust game because player *A*'s tran sfer is an indication of trust and player *B*'s return is an indication of trustworthiness. One of the advantages of using the trust game in this

[19] Bear in mind that player *A* can choose to send nothing to player *B*.

setting, is that it allows one to assess the efficiency of an anonymity rule because better treatment in this game yields higher overall payoffs for the players.

Fershtman et al. (2005) employ the trust game to compare the amounts sent by player *A*s to individuals with clear group affiliation and individuals with no clear group affiliation to determine whether the player *A*s' behaviour can be characterised as nepotism or discrimination. Specifically, the scholars use this experimental test to analyse linguistic segmentation between the Flemish and Walloons in Belgium and religious segmentation between ultra-orthodox and secular Jews in Israel. In Belgium, they find evidence of discrimination. Both the Flemish and Walloons display an in-group bias and treat anonymous individuals in the same way as they treat members of their own group. Thus, the two linguistic groups discriminate against each other but only when members of the groups can be identified as such. When comparing ultra-orthodox and secular Jews in Israel, Fershtman et al. (2005) find evidence of nepotism. Thus, both groups display an in-group bias and treat anonymous individuals in the same way as they treat members of the other group.

VII. EXPERIMENTAL DESIGN

Experimental subjects were recruited from six different high schools in the greater Cape Town area. This sample is of particular interest because these students have spent much of their lives in the "new" South Africa and have thus had the opportunity to participate in a more integrated schooling environment, which presumably affects their attitudes to race.

Each participating school was visited three times. During the initial visit, students were told about the research project and were given the opportunity to sign up as experimental subjects. During the second visit, the students who had signed up previously had their photographs[20] taken and were asked to complete a questionnaire that elicited demographic and attitudinal information. Importantly, the second visit was conducted two to three weeks before the experiments were run so as to reduce the potential for priming of subjects. During the third visit, the experiments were run.

Experiments were conducted at the participating schools and each experimental session involved at least three of the schools to ensure that there was a sufficient degree of racial heterogeneity in the subject pairings. Students participated in the Berg, Dickhaut and McCabe (1995) trust game with one individual assigned the role of proposer and his partner acting as trustee. The endowment used in the game was thirty rand[21] and proposers were asked how much of this money they wanted to transfer to their trustee, knowing that whatever amount they transferred would be tripled. Once they had made their offers, but before the trustee had been given a chance to respond, proposers were asked to record how much they expected their partner to return to them. The trustee's decision of how much to return to the proposer concluded the experiment and all payments were made in cash at the end of the experimental session.

Two experimental treatments were used to analyse racial discrimination. In the first, photographs were used to reveal the racial identity of the partners, with care taken to

[20] The photographs were taken as head-shots against a blue background so that race and gender were the only salient descriptives in the picture.
[21] Subjects were also paid a show-up fee.

prevent pairings of individuals who attended the same school. In the second, no information pertaining to the individuals' partners was given. This design allows us to compare how proposers respond to trustees with clear group affiliation and how they respond to trustees with no clear group affiliation.

To ensure the anonymity of offers, students were given a three-sided cardboard privacy box that stood on their desks, behind which offers were recorded. After the conclusion of the experimental session students were asked to complete additional questionnaires which were designed to elicit any doubts that the students may have had about the validity of the experiment.

A research team, which included a team leader, room monitors and "phoners", were sent to each school on the day of an experimental session. Proposers and Trustees were assigned to different classrooms and each classroom had a room monitor who ran the experiment. Given the diverse locations of the participating schools, subject's offers were communicated via mobile phone by the designated "phoners". "Phoners" were additional research assistants who were not present in the classroom while the experiments were conducted. Instead, they waited outside the classroom until proposer's offers had been recorded and their forms had been handed back to the room monitor. Once this process was complete, the phoners recorded the offers onto a single sheet of paper after explaining that because they had not been in the classroom during the experiment they had no way of knowing which student had made any particular offer. The phoners then called the location where the trustees were waiting for the offers. It is important to note that each phoner followed the same protocol in every group and that the same script was used when transmitting the offers so as to reinforce the credibility of the experiment to the students.

Phoners initiated their calls in the presence of the students but then left the classroom before transmitting the actual offers. However, the phoners left the classroom door open so that the students could verify that they were actually still on the telephone. Participating students were told that this was done to maintain the privacy of their offers because other students in the classroom would not be able to hear what offers they had made. Although this might have influenced the students' perceptions about

the credibility of the experiment, post-experiment questionnaires did not indicate that this was a problem[22].

A total of 465 students participated in the experiments, with ages ranging from 13 to 21. Males constituted 47 percent of the sample. Just over two fifths of the students were Black, with White and Coloured students comprising the remainder in roughly equal proportions.

[22] Post-experiment questionnaires were drawn from Frolich and Oppenheimer (2000). In regressions not reported here, none of the doubt variables significantly affected behaviour in the trust game.

VIII. RESULTS

Before conducting an in-depth analysis on the patterns of discrimination evident in the data, it is necessary to describe the general results from the trust game experiments. We find that proposers transferred 31 percent of their endowment, on average, in the trust game – refer to Table V. This is somewhat lower than other studies, where proposers typically send 50 percent of their endowment to trustees (Camerer, 2000). However, Harbaugh et al (2002) find that in trust games run on school children in the United States - a sample most comparable to this study - proposers' offers were 33 percent on average.

We find that, on average, proposers' expect 33 percent of their tripled offer to be returned to them. In other words, proposers' expect to break even when they engage in an interaction with trustees; given that they transfer R10 on average, they expect R10 in return. These results describe the sample as a whole but we find interesting variations according to the race of proposers and trustees. We describe these results henceforth. First, we conduct a non-parametric analysis of differences in the behaviour of Black, White and Coloured proposers. Then we develop more sophisticated parametric regression models to analyse the conditional impact of particular variables on the patterns of trust and discrimination evident in the data.

Table V: Mean Offers in Trust Game by Race of Subjects

Categorisation	Mean offer as proportion of endowment		Proportion of tripled offer proposer expects to be returned	
		By race of proposer		
Proposer is Black	0.23	(0.20)	0.37	(0.30)
	102		*100*	
Proposer is White	0.42	(0.30)	0.30	(0.17)
	58		*58*	
Proposer is Coloured	0.33	(0.25)	0.30	(0.24)
	74		*74*	
Total	0.31	(0.25)	0.33	(0.26)
	234		*232*	
		By race of trustee		
Trustee is Black	0.27	(0.28)	0.26	(0.24)
	70		*70*	
Trustee is White	0.36	(0.24)	0.36	(0.20)
	55		*55*	
Trustee is Coloured	0.38	(0.24)	0.39	(0.28)
	44		*44*	
Trustee is Anonymous	0.25	(0.23)	0.35	(0.29)
	65		*63*	
Total	0.31	(0.25)	0.33	(0.26)
	234		*232*	
		By race pairings		
Black to Black	0.18	(0.17)	0.31	(0.30)
	24		*24*	
Black to non-Black	0.29	(0.20)	0.41	(0.28)
	46		*46*	
Black to Anonymous	0.17	(0.18)	0.38	(0.33)
	32		*30*	
White to White	0.47	(0.26)	0.40	(0.16)
	21		*21*	
White to non-White	0.39	(0.35)	0.23	(0.17)
	27		*27*	
White to Anonymous	0.38	(0.27)	0.32	(0.12)
	10		*10*	
Coloured to Coloured	0.49	(0.25)	0.35	(0.23)
	18		*18*	
Coloured to non-Coloured	0.26	(0.23)	0.26	(0.21)
	33		*33*	
Coloured to Anonymous	0.32	(0.22)	0.33	(0.29)
	23		*23*	

In all of the above pairings, the race of the proposer is presented first, followed by the race of the trustee. Standard deviations in brackets and sample size in italics.

NON-PARAMETRIC RESULTS

RESULT 1: BLACK PROPOSERS TRUST LESS

Black proposers transfer significantly lower amounts than White or Coloured proposers. Specifically, Black proposers send 23 percent of their endowment to trustees, on average, as compared with transfers of 42 percent and 33 percent by White and Coloured proposers, respectively. These differences are significant at the 1 percent level in Black-White ($Z = -4.032$, $p = 0.0001$) and Black-Coloured ($Z = -2.997$, $p = 0.0027$) comparisons using the non-parametric Mann-Whitney test[23]. This result is consistent with Ashraf et al (2003) who find that Black proposers transfer significantly less than proposers from other race groups in a sample of South African university students. Despite these lower offers, Black proposers expect a larger proportion of their tripled offer to be returned to them than do White or Coloured proposers (although this difference is not significant in any comparisons).

RESULT 2: BLACK AND ANONYMOUS TRUSTEES ARE TRUSTED LESS

Black trustees are sent 27 percent, and anonymous trustees 25 percent, of the proposer's endowment, on average. These transfers are significantly less (at the 1 percent level using Mann-Whitney) than the offers of 36 percent and 38 percent made to White and Coloured trustees, respectively[24]. In addition, proposers expect Black trustees to return significantly less (at the 1 percent level using Mann-Whitney) than White ($Z = -2.957$, $p = 0.0031$) or Coloured ($Z = -2.387$, $p = 0.017$) trustees[25]. Specifically, proposers expect Black trustees to return 26 percent of the tripled offer, on average, as compared to returns of 36 percent and 39 percent by White and Coloured trustees, respectively. One may argue that the lower amounts sent to Black

---

[23] There is no significant difference in the average transfers in White-Coloured comparisons ($Z = 1.597$, $p = 0.1103$).

[24] The Mann-Whitney Z-statistics and p-values for the various comparisons are: Black-White ($Z = -2.5$, $p = 0.0124$); Black-Coloured ($Z = -2.601$, $p = 0.0093$); Coloured-White ($Z = -0.168$, $p = 0.8665$); Anonymous-Black ($Z = -0.2$, $p = 0.8415$); Anonymous-White ($Z = 2.78$, $p = 0.0054$); Anonymous-Coloured ($Z = 2.86$, $p = 0.0042$)

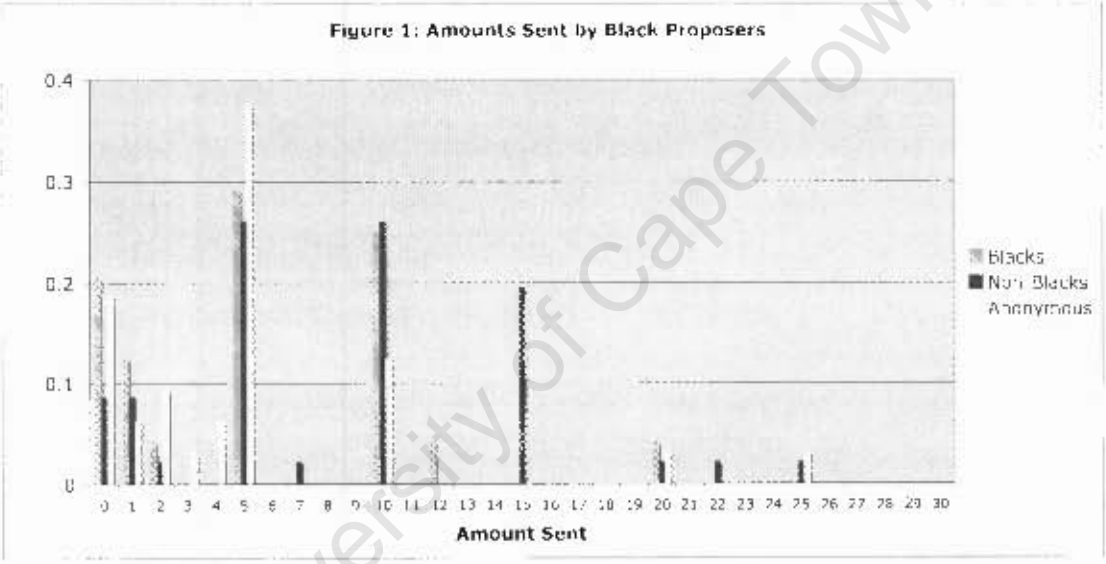
[25] There are no significant differences in the expected returns in White-Anonymous, Coloured-Anonymous and Black-Anonymous comparisons.

trustees are consistent with their lower expected returns but this conclusion is premature until we have conducted a more thorough analysis on the behaviour exhibited by the different race groups.

Please note that in the analysis to follow, the proposer's behaviour towards his race group (say, Blacks) will be compared to his behaviour towards anonymous individuals and his behaviour towards the other race groups combined (non-Blacks). In analyses not reported here we found no qualitative differences in our results when we combined the other race groups or separated them (non-Blacks as opposed to Whites and Coloureds) and thus for ease of exposition we chose to combine the other race groups and focus on transfers to an individual's own race group, to anonymous individuals and to the other race groups combined.

RESULT 3: BLACKS DISPLAY A NEPOTISTIC OUT-GROUP BIAS AND FAVOUR NON-BLACK PARTNERS

Recall that to classify a race group's behaviour as discrimination or nepotism, one must compare that race group's offers to individuals with clear group affiliation to that race group's offers to individuals with no clear group affiliation. Figure 1 displays the distribution of money transfers by Blacks, assigned the role of proposer, to Blacks, anonymous individuals and non-Black race groups.



As is evident, more than 20 percent of Black proposers transfer nothing to Black trustees[26]. Similarly, just less than 20 percent of Black proposers transfer nothing to anonymous trustees. This is markedly different to the proposers' behaviour towards non-Blacks, with only 8 percent receiving zero transfers. Perhaps the most striking point on this distribution is at transfers of 15 rand – in other words, half of the proposer's endowment. 20 percent of Black proposers transfer half of their endowment to non-Blacks but no Black proposers transfer 15 rand to Black or Anonymous trustees. Figure 1 therefore indicates that Blacks are willing to engage in exchange far more readily and at higher levels with non-Blacks than they are with Black or anonymous trustees. This result is confirmed in Table VI. Comparing the transfers in Black-Black and Black - non-Black pairings, we find that Blacks transfer

[26] Note that this statement refers to Black-Black pairings just as a statement that discusses Black proposers and anonymous trustees refers to Black-Anonymous pairings.

significantly greater amounts to non-Blacks. Similarly, Black proposers transfer significantly greater amounts to non-Blacks than they do to anonymous trustees. In other words, Blacks exhibit an out-group bias and choose to trust non-Blacks more than they trust Black or anonymous individuals.

Table VI: Non-parametric (Mann-Whitney) Tests of Differences in Mean Offers by Race of Subjects

Mean offer as proportion of endowment

Transfer 1		Transfer 2		Mean Transfer	Mann-Whitney U-Test	
From	To	From	To	Difference	Z Test	P
Black	Black	Black	non-Black	-0.10	**2.086**	**0.037**
Black	Black	Black	Anonymous	0.01	-0.51	0.6097
Black	non-Black	Black	Anonymous	0.12	**-2.89**	**0.0038**
Coloured	Coloured	Coloured	non-Coloured	0.22	**-2.912**	**0.0036**
Coloured	Coloured	Coloured	Anonymous	0.17	**-1.93**	**0.0536**
Coloured	non-Coloured	Coloured	Anonymous	-0.06	1.075	0.2822
White	White	White	non-White	0.07	-1.062	0.2883
White	White	White	Anonymous	0.09	-1.332	0.183
White	non-White	White	Anonymous	0.01	0.191	0.8482

Proportion of tripled offer proposer expects to be returned

Transfer 1		Transfer 2		Mean Transfer	Mann-Whitney U-Test	
From	To	From	To	Difference	Z Test	P
Black	Black	Black	non-Black	-0.10	**1.743**	**0.0814**
Black	Black	Black	Anonymous	-0.07	0.754	0.4507
Black	non-Black	Black	Anonymous	0.03	-1.012	0.3114
Coloured	Coloured	Coloured	non-Coloured	0.09	-0.999	0.3176
Coloured	Coloured	Coloured	Anonymous	0.01	-0.282	0.7782
Coloured	non-Coloured	Coloured	Anonymous	-0.07	0.702	0.4829
White	White	White	non-White	0.17	**-3.483**	**0.0005**
White	White	White	Anonymous	0.08	**-1.789**	**0.0737**
White	non-White	White	Anonymous	-0.09	1.332	0.183

To classify the Black group's behaviour as either nepotism or discrimination we must compare their offers to Black and anonymous trustees. Figure 1 displays some differences in Black proposer behaviour with regard to these groups. For example, 38 percent of Black proposers transfer a sixth of their endowment (R5) to anonymous trustees whereas only 29 percent of Black proposers transfer this amount to Black trustees. However, only 12.5 percent of Black proposers transfer a third of their endowment (R10) to anonymous trustees, compared to 25 percent of Black proposers that make transfers of this magnitude to Black trustees. Despite these discrepancies, there is no statistically significant difference in the amounts sent to Black and anonymous trustees – refer to Table VI. Consequently, we can classify the behaviour exhibited by Black proposers as conforming to a nepotistic out-group bias. In other words, Black proposers favour other races but only when they can be identified as such.

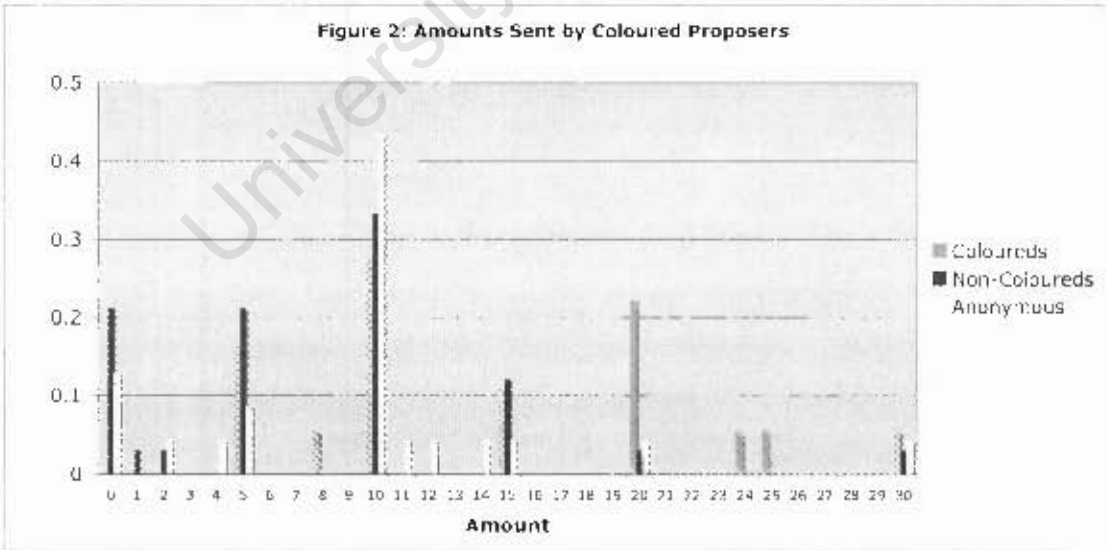
In an analysis of proposer expectations about trustee returns, we find that Black proposers expect Black trustees to transfer significantly less back to them than non-Black trustees[27] (Table VI). Given this expectation, it is rational for Black proposers to transfer less to Black trustees in the absence of any information to update their beliefs. Thus, while Black proposers exhibit a nepotistic out-group bias, their behaviour may be conditioned on their expectations of the lower levels of trustworthiness of Black trustees – in other words, Black proposers expected higher returns from non-Black trustees. In this sense their behaviour resembles a form of statistical nepotism more so than a taste for nepotism. However, this conclusion is tentative and must be interrogated in a conditional regression framework, which will be conducted in the ensuing sections.

It is important to note that given the pattern of nepotistic behaviour evidenced in the Black race group, an anonymity rule would lead to greater equity but lower efficiency. This statement is premised on the fact that in our setting, that of a trust game, cooperation is desirable. As we have discovered, Blacks treat non-Blacks more favourably only when they can be identified as such. The introduction of an anonymity rule would prohibit such identification and would therefore inhibit cooperation, which leads to a lower overall surplus to be shared amongst the players.

[27] There are no significant differences in proposer expectations between Black-Black and Black-Anonymous pairings and Black – non-Black and Black-Anonymous pairings.

RESULT 4: COLOUREDS DISPLAY A NEPOTISTIC IN-GROUP BIAS AND FAVOUR COLOURED PARTNERS

Figure 2 represents the distribution of money transfers from Coloureds, assigned the role of proposer, to Coloured, non-Coloured and anonymous trustees. As is evident, more than 20 percent of Coloured proposers send nothing to non-Coloureds. Similarly, 13 percent of Coloured proposers transfer nothing to anonymous trustees. On the other hand, no Coloured proposers send zero transfers to Coloured trustees. It is therefore apparent that Coloureds are far less willing to engage in exchange with non-Coloureds and anonymous individuals than they are with Coloured trustees. Focussing specifically on transfers of 20 rand – two-thirds of the proposer's endowment – we find that more than 20 percent of Coloured proposers transfer this amount to Coloured trustees. The comparable figures for non-Coloureds and anonymous individuals are 3 and 4 percent, respectively. Figure 2 therefore indicates that Coloureds display an in-group bias, favouring Coloureds over non-Coloureds. This result is confirmed in Table VI, where we find that Coloured proposers transfer a significantly larger amount to Coloureds than they do to non-Coloured trustees.



Interestingly more than 40 percent of Coloured proposers transfer a third of their endowment (R10) to anonymous trustees, whereas only 28 and 33 percent of Coloured proposers transfer this amount to Coloured and non-Coloured trustees, respectively. This spike in the distribution may seem to suggest that Coloured proposers treat anonymous individuals and Coloured trustees similarly; although

Coloured proposers are less willing to engage in exchange with anonymous individuals than they are with Coloureds and a far smaller percentage receive transfers of R20, this spike may make average transfers similar. However, Figure 2 indicates that the distribution of money transfers to anonymous individuals is skewed to the right, implying that the mass of the distribution is concentrated in relatively low transfers. In contrast, the distribution of transfers to Coloured trustees is more symmetrical about the mean which suggests that Coloured proposers transfer greater amounts, on average, to Coloured trustees. This result is verified in Table VI. We find that Coloureds send significantly smaller amounts to anonymous individuals.

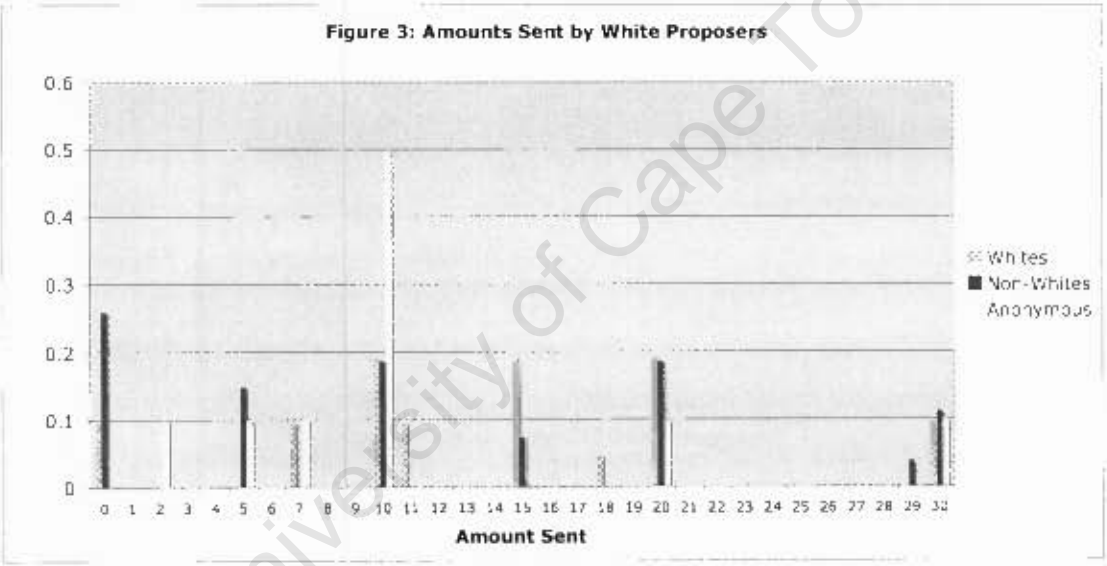
In a comparison of the transfers to non-Coloureds and anonymous trustees, we find that Coloured proposers do not differ significantly in their trust towards these groups (Table VI). Consequently, the behaviour of Coloured proposers can be classified as nepotism, in the original sense suggested by Becker (1971) in that they display an in-group bias. Consequently, Coloured proposers behave favourably towards other Coloureds but only when they can be identified as such.

Interestingly, there are no significant differences in Coloured proposer expectations regarding trustee return behaviour (Table VI). Nevertheless, Coloureds favour their in-group and thus exhibit a taste for nepotism.

As was the case with Black proposers, the introduction of an anonymity rule would foster greater equity but lower efficiency amongst the Coloured race group. By outlawing the use of race as an identifying characteristic, Coloured proposers would not be able to express their nepotistic preferences, and thereby favour their in-group, which would lead to lower transfers and a smaller overall surplus to be divided amongst the players.

RESULT 5: WHITE PROPOSERS TRANSFER SIMILAR AMOUNTS TO ALL RACE GROUPS

Figure 3 represents the distribution of money transfers from White proposers to White, non-White and anonymous trustees. The figure shows that there are some noticeable differences in White proposer behaviour but what stands out is the similarity in their transfers to the different groups. Table VI verifies this result. We find that there are no significant differences in White proposer behaviour with regards to the identity of trustees. In other words, Whites do not discriminate or practise nepotism, instead they transfer similar amounts to all race groups.



Although Whites behave similarly towards all race groups they have markedly different expectations regarding the returns they expect from the various trustees. As Table VI indicates, White proposers expect White trustees to transfer a significantly larger amount back to them than non-Whites or anonymous individuals. This may suggest an interplay of different behavioural motivations on White's trusting behaviour. In other words, concerns such as altruism may affect White transfers because even though they expect out-groups to transfer less back to them, there are no significant differences in their offers to the these groups (Carter and Castillo, 2003; Cox, 2000; Ashraf et al, 2003). Unfortunately the current experimental design does not allow us to control for this.

RESULT 6: NEPOTISM LEADS TO LOWER OVERALL PAYOFFS ACROSS RACE GROUPS

An overall payoff in a trust game is the total amount of money generated in a proposer-trustee pairing. Thus, if a proposer sends 20 rand to his trustee, this amount is tripled, yielding 60 rand. When added to the 10 rand that the proposer chooses not to transfer, 70 rand is the total amount of money generated in the proposer-trustee pairing – the overall payoff - that will be allocated between the players depending on trustee return behaviour. Table VII displays the overall payoffs for proposer-trustee pairings depending on the identity of the players.

Table VII: Overall Payoffs Generated in Proposer-Trustee Pairings

	Trustee			
Proposer	Own Race	Other Race	Anonymous	Weighted Average
Black	41	47.17	40.25	43.55
Coloured	59.11	45.64	48.96	49.95
White	58	53.63	52.8	55.07

For White and Coloured proposers, the overall payoff is maximised when they are paired with individuals of their own race group. This pattern is reversed for Black proposers who maximise their overall payoff when paired with other races (non-Blacks). Interestingly, Coloured proposers attain the highest overall payoff of all race groups when they are paired with Coloured trustees. As discussed in Result 4, the Coloureds' nepotistic in-group bias fosters cooperation in same race pairings. Thus, if you are Coloured you will want to be paired with a Coloured partner if maximising the overall payoff is your goal. However, if you are under a "veil of ignorance" (Rawls, 1971) as to your identity, which race group would you choose to be paired with? This question is at the heart of the calculations performed in the "Weighted Average" column in Table VII. In this column, we calculate the overall payoff as a weighted average of the payoffs across all race groups to determine which type of proposer (White, Coloured or Black) generates the highest overall payoff when taking all race groups into account. We find that Whites manage to attain a higher overall payoff than Blacks or Coloureds. The overall payoff as a weighted average across race pairings is 55.07 when the proposer is White as compared to 43.55 and 49.95

when the proposers are Black and Coloured, respectively. This is attributed to the White proposers' lack of discrimination, which produces greater gains for their partners on average. Thus, without knowledge of your identity it would be rational to choose to be paired with a White proposer.

PARAMETRIC REGRESSION RESULTS

When developing regression models to interrogate the data, it was necessary to determine whether models which pooled the data across race groups could be used or whether single race regression models had to be estimated separately. The advantage of pooling the data is that more observations provide more consistent coefficient estimates. However, if the behaviour of the race groups differ markedly then pooling the data is nonsensical because it will provide inconsistent results. Consequently, a Chow test was conducted on the full sample to determine whether we should reject the null hypothesis that the data could be pooled. The test provided an F-statistic of 3.14 ($p = 0.0003$), implying that the data could not be pooled and we would therefore have to estimate the regression models separately for each race group. A Tobit model specification was used to account for corner solutions at zero.

RESULT 7: BLACK PROPOSERS ARE INFLUENCED BY STATISTICAL NEPOTISM AND A TASTE FOR NEPOTISM

Table VIII presents the results from the Tobit regressions for Black proposers which account for the identity of trustees (column 1) and proposer expectations (column 2). We find that in the baseline regression – reported in column 1 – Black proposers transfer significantly lower amounts to Black and anonymous trustees than they do to non-Blacks (our omitted category). This confirms the non-parametric results in a conditional regression framework. Similarly, we find that there is no significant difference between transfers to Black and anonymous trustees ($F = 0.16$, $p = 0.6942$). Thus, Blacks display a nepotistic out-group bias by favouring non-Blacks over Black and anonymous individuals.

Table VIII: Tobit regression for Black proposers conditioning offers on Identity and Expectations

	Offer as a proportion of the endowment	
	Column 1	Column 2
Subject is Female	-0.037	-0.044
	[0.043]	[0.043]
Trustee is Female	-0.022	-0.018
	[0.051]	[0.050]
Trustee is Black	-0.122**	-0.101*
	[0.054]	[0.053]
Trustee is Anonymous	-0.147**	-0.129**
	[0.056]	[0.055]
Age	-0.323	-0.371
	[0.236]	[0.236]
Age squared	0.01	0.012
	[0.007]	[0.007]
Proposer's expected return		0.237***
		[0.072]
Constant	2.893	3.154
	[1.965]	[1.963]
Log Likelihood	12.19	23.44
Observations	102	100

Standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

To determine whether Black proposer behaviour is determined solely by statistical nepotism we include the proposer's expected return in the regression reported in column 2. If Black proposers base their transfers purely on their expectations of trustee returns then we would expect their transfers to Black and anonymous individuals to be statistically indistinguishable from their transfers to non-Blacks after accounting for their expected returns. Including this variable, which is highly significant, raises the coefficient estimates on both the Black and anonymous trustee dummies. However, the estimates are still negative and significant, which implies that Black proposers indulge their taste for nepotism by sending lower amounts to Black and anonymous trustees despite their expectations of trustee return behaviour. Consequently, Black proposers are motivated both by statistical concerns – as evidenced by the significance of the "Proposer's expected return" variable and the attenuation of the coefficient estimates on the Black and anonymous trustee dummies – and a taste for nepotism that leads to lower transfers to Black and anonymous individuals.

RESULT 8: COLOURED PROPOSERS HAVE A TASTE FOR NEPOTISM

As discussed in Result 4, there are no significant differences in Coloured proposer expectations regarding trustee return behaviour and yet Coloureds transfer significantly lower amounts to anonymous and non-Coloured individuals. This would suggest that Coloureds have a taste for nepotism because they do not take statistical concerns into account when making their decisions. To analyse this claim we ran Tobit regressions for Coloured proposers where we conditioned the amount sent on trustee identity (column 1) and proposer expectations (column 2).

Table IX: Tobit regression for Coloured proposers conditioning offers on Identity and Expectations

	Offer as a proportion of the endowment	
	Column 1	Column 2
Subject is Female	0.026	0.073
	[0.065]	[0.058]
Trustee is Female	-0.041	-0.026
	[0.074]	[0.066]
Trustee is Coloured	0.264***	0.234***
	[0.079]	[0.070]
Trustee is Anonymous	0.041	0.021
	[0.085]	[0.075]
Age	-0.4	-0.612
	[0.996]	[0.886]
Age squared	0.014	0.021
	[0.032]	[0.029]
Proposer's expected return		0.542***
		[0.115]
Constant	3.003	4.535
	[7.651]	[6.803]
Log Likelihood	13.32	34
Observations	74	74

Standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table IX presents the results from these regressions. We find that Coloured proposers transfer significantly greater amounts to Coloured trustees than they do to non-Coloureds (our omitted category). In addition, their transfers are significantly greater to Coloured individuals than they are to anonymous trustees ($F = 6.58$, $p = 0.0125$). Consequently, Coloureds display a nepotistic in-group bias. However, when we account for the proposer's expected return we find that this variable is positive and highly significant, implying that Coloured proposer behaviour is conditioned on their expectations of trustee returns. Inclusion of this variable also tempers the effect that being a Coloured trustee has on the Coloured proposers' offers. Nevertheless we find that Coloured proposers transfer significantly larger amounts to Coloured trustees

than they do to non-Coloured and anonymous individuals. Given that proposer offers to Coloured trustees are far larger in magnitude than their offers to non-Coloureds and anonymous individuals (on the order of 20 percent), it is safe to say that they indulge their taste for nepotism by favouring their in-group although they do take account of statistical concerns.

RESULT 9: WHITE PROPOSERS BEHAVE CONTRARY TO THEIR EXPECTATIONS

In Result 5, we found that there were no significant differences in White proposer behaviour towards trustees of different races despite their expectations of lower returns from non-Whites and anonymous individuals. We investigate this finding in a conditional regression framework where offers are conditioned on trustee identity (column 1) and proposer expectations (column 2).

Table X: Tobit regression for White proposers conditioning offers on Identity and Expectations

	Offer as a proportion of the endowment	
	Column 1	Column 2
Subject is Female	-0.08	-0.03
	[0.102]	[0.082]
Trustee is Female	0.02	0.06
	[0.104]	[0.083]
Trustee is White	0.082	-0.196**
	[0.103]	[0.093]
Trustee is Anonymous	0.061	-0.083
	[0.135]	[0.108]
Age	2.742*	1.776
	[1.518]	[1.302]
Age squared	-0.086*	-0.057
	[0.048]	[0.041]
Proposer's expected return		1.578***
		[0.267]
Constant	-21.287*	-13.776
	[11.845]	[10.202]
Log Likelihood	5.53	38.96
Observations	58	58

Standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table X, presents the results from these regressions. In the baseline regression (column 1) we find that there are no significant differences in the transfers to White and non-White individuals nor in the transfers to White and anonymous individuals ($F = 0.02$, $p = 0.8785$). This supports our earlier finding. However, when we include the proposer's expected return in the regression reported in column 2, we find that White proposers transfer significantly less to White trustees than they do to non-Whites[28]. This result at first appears anomalous. Given their expectations of higher returns from White trustees, one would expect rational proposers to transfer more to their in-group. One may speculate that White proposers hope to earn a specific threshold amount

[28] There is no significant difference in the transfers to White and anonymous individuals ($F = 0.99$, $p = 0.3251$).

from the experiment. Consequently they transfer less to White trustees because they recognise that this threshold will be easier to obtain in a same race pairing. Another potential explanation, which was the one offered earlier, is that although the game is designed to measure trust, behavioural motivations such as altruism may have a confounding effect. For example, Whites may choose to transfer more to non-Whites, conditional on their expectations, because they recognise that non-Whites were subject to unfair discrimination under Apartheid.

IX. CONCLUSION

This paper has tracked the theoretical and empirical developments in the study of discrimination and has employed a new experimental technique for analysing racial discrimination among a sample of South African schoolchildren. Our results show that analysing the behaviour of different race groups yields interesting insights into the form of discrimination practised by these groups.

The analysis indicates that Blacks exhibit a nepotistic out-group bias and therefore choose to favour non-Blacks over Black and anonymous individuals. In addition, their behaviour is influenced both by a 'taste' for nepotism and 'statistical' nepotism in that they take into account their expected returns from the trustees that they are paired with.

Coloureds, on the other hand, display a nepotistic in-group bias and thus send larger amounts to Coloureds than they do to non-Coloured and anonymous individuals. Although Coloureds take account of statistical concerns when making their decisions, their behaviour more closely resembles a 'taste' for nepotism given the sheer magnitude of the difference in their transfers to Coloured trustees as opposed to non-Coloured and anonymous individuals.

Whites send similar amounts to all race groups and thus do not practise nepotism or discrimination. Interestingly, when conditioning their transfers on expected returns, we find that Whites send significantly greater amounts to non-Whites despite the lower expected returns from these race groups. This may suggest the confounding influence of altruism on their behaviour. Unfortunately our experimental design does not allow us to disentangle these behavioural motivations. Carter and Castillo (2003) argue that if subjects take part in a dictator game and a trust game then these independent effects can be isolated. Clearly this is an important consideration for further studies.

With reference to the results reported in Section V – the O-B methodology applied to South African data – we similarly find that Blacks are discriminated against by receiving significantly lower transfers than Whites and Coloureds. Crucial to our

result is the fact that Blacks display a nepotistic out-group bias and choose to transfer less to their own race group than to non-Blacks. This highlights an advantage of our approach in that it allows us to determine the precise source of the differential treatment that race groups receive. Studies that employ the O-B methodology, whilst being able to make more general comments about discrimination in the labour market, fail to determine whether nepotism or discrimination is being practised and cannot reveal the way in which particular race groups respond to others.

An oft-debated argument in studies of racial discrimination, particularly in South Africa, is whether the patterns that are revealed in the data truly reflect racial discrimination or whether they instead reflect discrimination along class lines. This is clearly an important debate. For example, the fact that White proposers made the highest mean transfers in our study (Table V) arguably reflects their higher socio-economic status on average. However, to suggest that all the results in this paper can be attributed to class is untenable. First, the photographs that experimental subjects were shown when paired with their partners, were head-shots taken against a blue background. Consequently, only race and gender were observable to the participants. Second, the patterns in the data are not consistent with wholly class-based explanations. Although Black proposer behaviour could be rationalised as being based on considerations of class – *vis.* they transfer more to non-Blacks because they expect higher returns – the same arguments do not apply to Coloured or White proposers. Why would Coloureds transfer more to Coloureds and Whites send similar amounts to all race groups if considerations of class were the underlying cause of their behaviour?

Admittedly both class and race have an important impact on individuals' decisions and ideally one would want to control for class perfectly in this study. Acquiring accurate information on socio-economic status is difficult in samples of adults. To do so on a sample of children is near impossible and the data collected is bound to be riddled with noise. We therefore endeavoured to remove class as a salient factor in the experiment by using head-shots to convey identity, rather than control for class in a regression using a very blunt measure of socio-economic status.

In sum, an experimental technique to explore racial discrimination in South Africa was adopted in this paper. The methodology allows one to analyse the discriminatory/nepotistic behaviour of particular race groups in their interactions with others. Further research that takes into account other behavioural motivations such as altruism and controls better for socio-economic status is needed to draw definitive conclusions on racial discrimination in contemporary South Africa.

REFERENCES

Adam, B. 1981. "Stigma and employability: discrimination by sex and sexual orientation in the Ontario legal profession". *Canadian Review of Sociology and Anthropology*, Vol. 18, No. 2, pp. 216-222.

Aigner, D. and Cain, G. 1977. "Statistical Theories of Discrimination in Labor Markets," *Industrial and Labor Relations Review,* Vol. 30, pp. 175-87.

Alexis, M. 1974. "The Political Economy of Labor Market Discrimination: Synthesis and Exploration." In A. Horowitz and G von Furstenburg (eds) *Patterns of discrimination.* Lexington, Massachusetts: D. C. Heath-Lexington Books.

Allanson, P., Atkins, J. and Hinks, T. 2002. "No end to the racial wage hierarchy in South Africa?" *Review of Development Economics*, Vol. 6, No. 3, pp. 442-459

Altonji, S. and Blank, R. 1999. "Race and gender in the labour market" in O. Ashenfelter and D. Card (eds). *Handbook of Labour Economics*. Vol. 3, ch. 48, Amsterdam: Elsevier.

Anderson, D. and Haupert, M. 1999. "Employment and Statistical Discrimination: A Hands-On Experiment," *The Journal of Economics*, Vol. 25, No. 1, pp. 85-102.

Anderson, L., Fryer, R. and Holt, C. 2006. "Discrimination: Experimental Evidence from Psychology and Economics" in W. Rodgers (ed.) *Handbook on the Economics of Discrimination*, Edward Elgar Publishing, pp. 97-119

Arrow ,K. 1972. "Models of Job Discrimination" and "Some Models of Race in the Labor Market." Chapters II and VI in A Pascal (ed) *Racial discrimination in economic life.* Lexington, Massachusetts: D. C. Heath-Lexington Books.

Arrow, K. 1972. "Gifts and Exchanges". *Philosophy and Public Affairs*, Vol. 1, pp. 343-362.

Arrow, K. 1973. "The Theory of Discrimination", in O.Ashenfelter and A.Rees (eds) *Discrimination in Labor Markets*, Princeton University Press, New Jersey, pp 3-33.

Ashenfelter, O. and Oaxaca, R. 1987. "The Economics of Discrimination: Economists Enter the Courtroom*" The American Economic Review*, Vol. 77, No. 2, *Papers and Proceedings of the Ninety-Ninth Annual Meeting of the American Economic Association.* pp. 321-325.

Ashraf, J. and Ashraf, B. 1993. "Estimating the gender wage gap in Rawalpindi city", *Journal of Development Studies*, Vol. 29, No.2, pp. 365-76.

Ashraf, N., Bohnet, I. and Piankov, N. 2003. "Decomposing Trust," *Discussion paper*, Harvard University.

Banerjee, B. and Knight, J. 1985. 'Caste Discrimination in the Asian Urban Labour Market', *Journal of Development Economics*, Vol. 17, pp. 277-307.

Becker, G. 1957 (1st edition). *The Economics of Discrimination.* Chicago: Chicago University Press

Becker, G. 1971 (2nd edition). *The Economics of Discrimination.* Chicago: Chicago University Press

Berg, J., Dickhaut, J. and McCabe, J. 1995. 'Trust, reciprocity, and social history," *Games and Economic Behaviour*, Vol. 10, pp. 122–142.

Bergmann, B. 1970. "Occupational segregation, wages, and profits when employers discriminate by race and sex*." Mimeo*, Project on the Economics of Discrimination, College Park, Maryland.

Bergmann, B. 1971. "The Effect on White Incomes of Discrimination in Employment," *Journal of*

Political Economy, Vol. 79, No. 2, pp. 294-313.

Bertrand, M. and Mullainathan, S. 2004. "Are Emily and Greg More Employable Than Lakisha and Jamal: A Field Experiment on Labor Market Discrimination," *American Economic Review*, Vol. 94, No. 4, pp. 991-1013.

Billig, M. 1985. "Prejudice, Categorization, and Particularization: From a Perceptual to a Rhetorical Approach," *European Journal of Social Psychology*, Vol. 15, pp. 79-103.

Billig, M. and Tajfel, H. 1973. "Social Categorization and Similarity in Intergroup Behaviour," *European Journal of Social Psychology*, Vol. 3, pp. 27-52.

Blinder, A.S. (1973), "Wage discrimination: reduced form and structural estimates", *Journal of Human Resources*, Vol. 8 No.4, pp. 436-55.

Brookes, M. and Hinks, T. 2004. "The Racial Employment Gap in South Africa". *South African Journal of Economics*, Vol. 72, No. 3, pp. 573-580.

Brown, C. and Gay, P. 1985. *Racial Discrimination 17 years after the Act*. London: Policy Studies Institute

Brown, R., Moon, M. and Zoloth, B. 1980. "Incorporating Occupational Attainment in Studies of Male-Female Earnings Differentials," *The Journal of Human Resources,* Vol. 15, No. 1, pp. 3-28.

Burger, R. and Jafta, R. 2006. "Returns to Race: Labour Market Discrimination in Post-Apartheid South Africa," *Working Papers* 04/2006, Stellenbosch University, Department of Economics

Camerer, C. 2002. *Behavioural Game Theory*. Princeton University Press, Princeton.

Card, D. and Krueger, A. 1992. "School Quality and Black-White Relative Earnings: a Direct Assessment", *Quarterly Journal of Economics,* Vol. 107, No. 1, pp. 151-200.

Carter, M., and Castillo, M. 2003. "An Experimental Approach to Social Capital in South Africa," *Discussion paper*, Department of Agricultural and Applied Economics.

Case, A. and Deaton, A. 1997. 'School Quality and Educational Outcomes in South Africa', *Discussion Paper*, Research Programme in Development Studies, Princeton University.

Chamberlain, D. and van der Berg, S. 2002. "Earnings functions, labour market discrimination and quality of education in South Africa," *Working Papers* 02/2002, Stellenbosch University, Department of Economics

Coate, S. and Loury, G. 1993b. "Antidiscrimination Enforcement and the Problem of Patronization." *American Economic Review Papers and Proceedings* 83, pp. 92-98.

Cotton, J. 1988. "On the decomposition of wage differentials", *Review of Economics and Statistics*, Vol. 70, No.2, pp. 236-43.

Cox, J. 2002. "Trust, Reciprocity, and Other Regarding Preferences: Groups vs Individuals and Males vs Females," in *Advances in Experimental Business Research*, R. Zwick, and A. Rapoport (eds) Vol. 331–350. Kluwer, Boston.

Daniel, W. 1968. *Racial Discrimination in England.* Middlesex: Penguin Books

Darity, W. and Mason, P. 1998. "Evidence on Discrimination in Employment: Codes of Color, Codes of Gender," *Journal of Economic Perspectives*, Vol. 12, No. 2, pp. 63-90

Darity, W. and Mason, P. 1998. "Evidence on Discrimination in Employment: Codes of Color, Codes of Gender." *Journal of Economic Perspectives*, Vol. 12, No. 2, pp. 63-90.

Darity, W. and Nembhard, J. 2000. "Racial and Ethnic Economic Inequality: The International Record," *American Economic Review*, Vol. 90, No. 2, pp. 308-311

Darity, W., Guilkey, D. and Winfrey, W. 1996. "Explaining Differences in Economic Performance Among Racial and Ethnic Groups in the USA: The Data Examined," *American Journal of Economics and Sociology,* Vol. 554, pp. 411-26.

Davis, D. 1987. "Maximal Quality Selection and Discrimination in Employment," *Journal of Economic Behavior and Organization*, Vol. 8, pp. 97-112.

Donaldson, A. and Roux, A. 1990. "Education, Employment and Incomes of Black South Africans in 1985", Paper: Conference on Literacy and Basic Adult Education for Development, Pretoria: Human Sciences Research Council.

Duncan, G. and Leigh, D. 1980. "Wage determination in the union and nonunion sectors: a sample selectivity approach", *Industrial and Labor Relations Review*, Vol. 34, No.1, pp. 24-34.

Edgeworth, F. 1922. "Equal Pay to Men and Women for Equal Work," *Economic Journal* Vol. 32, pp. 431-57.

Erichsen, G. and Wakeford, J. 2001. "Racial wage discrimination in South Africa before and after the first democratic election", University of Cape Town, Rondebosch, DPRU Working Paper No. 01/49.

Fershtman, C. and Gneezy, U. 2001. "Discrimination in a Segmented Society: An Experimental Approach," *Quarterly Journal of Economics*, CXV, pp. 351–377.

Fershtman, C., Gneezy, U. and Verboven, F. 2005. "Discrimination and Nepotism: The Efficiency of the Anonymity Rule", *Journal of Legal Studies*.

Festinger, L. 1957. *A Theory of Cognitive Dissonance*. Stanford, CA: Stanford University Press.

Freeman, R. 1973. "Changes in the Labor Market for Black Americans, 1948-72," *Brookings Papers and Proceedings,* pp. 67-120.

Freund, B. 1988. *The Africa Worker*. Cambridge: Cambridge University Press.

Frijters, P. 1999. "Hiring on the basis of expected productivity in a South African clothing firm". *Oxford Economic Papers*, Vol. 51, pp. 345-354.

Fryer, R. and Loury, G. 2005. "Affirmative Action and Its Mythology," *Journal of Economic Perspectives*, Vol. 19, No. 3, pp. 147-162.

Fryer, R., Goeree, J. and Holt, C. 2001. "An Experimental Test of Statistical Discrimination," *Discussion Paper*, University of Virginia.

Gomulka, J. and Stern, N. 1990. "The employment of married women in the United Kingdom 1970-83", *Econometrica*, Vol. 57, No. 226, pp. 171-99.

Gottschalk, P. 1997. "Inequality, Income Growth and Mobility: The Basic Facts," *Journal of Economic Perspectives,* Vol. 11, No. 2, pp. 21-40.

Grün, C. 2003. "Direct and indirect labour market discrimination in the South African labour market", *Mimeo,* University of Munich, Germany.

Harbaugh, W., Krause, K. and Liday, S. 2003. "Bargaining by Children," *Working Paper*, University of Oregon.

Harrison, G. and List, J. 2004. "Field Experiments," *Journal of Economic Literature*, Vol. 52, pp. 1009-1055.

Heckman, J. 1979. "Sample Selection Bias as a Specification Error," *Econometrica*, Vol. 47, No. 1, pp. 153-61.

Heckman, J. 1998. "Detecting Discrimination," *Journal of Economic Perspectives*, Vol. 12, No. 2, pp. 101-16.

Heckman, J. and Siegelman, P. 1993. "The Urban Institute Audit Studies: Their Methods," in M. Fix and R. Struyk, *Clear and Convincing Evidence: Measuraent of Discrimination in America.* Washington: The Urban Institute Press, pp. 187-258.

Hinks, T. 1999. "Racial Wage Discrimination and the End of Apartheid in South Africa: A Multilateral Approach". *Mimeo*, Middlesex University Business School

Hoff, K. and Pandey, P. 2003. "Why are Social Inequalities so Durable? An Experimental Test of the Effects of Indian Caste on Performance," *Discussion Paper*, World Bank, and Pennsylvania State University.

Hubbuck, J. and Carter, S. 1980. *Half a chance? A report on job discrimination against young blacks in Nottingham*. London: Commission for Racial Equity

Juhn, C., Murphy, K. and Pierce, B. 1991. "Accounting for the Slowdown in Black-White Wage Convergence" in M. Kosters (ed.) *Workers and Their Wages*, AEI Press.

Juhn, C., Murphy, K. and Pierce, B. 1993. "Wage Inequality and the Rise in Returns to Skill" *Journal of Political Economy*, Vol. 101, No. 3, pp. 410-42.

Jowell, R. and Prescott-Clarke, P. 1970. "Racial Discrimination and white-collar workers in Britain", *Race*, Vol. 11, pp. 397 – 417

Kingdon, G. and Knight, J. 2001a. "Race and the incidence of unemployment in South Africa", *CSAE Working Paper*, No. WPS/2001.18, Centre for the Study of African Economies, Oxford

Knight, J. and McGrath, M. 1987. 'The Erosion of Apartheid in the South African Labour Market: Measures and Mechanisms', *Applied Economic Discussion Paper,* No. 35, Institute of Economics and Statistics, University of Oxford.

Loury, G. 1977. "A Dynamic Theory of Racial Income Differences" in A. Wallace and A. LaMond (eds) *Women, Minorities, and Employment Discrimination*, Lexington, MA: D. C. Heath and Co.

Loury. G. 1981. "Intergenerational Transfers and the Distribution of Earnings", *Econometrica*, Vol. 49, No. 4, pp. 843-867

Loury, G. 2002. *The Anatomy of Racial Inequality*. Cambridge, Massachussetts: Harvard University Press.

Lundahl, M. and Wadensjo, E. 1984. *Unequal Treatment: A Study in the Neo-Classical Theory of Discrimination*, New York: New York University Press.

Lundberg, S. and Startz, R. 1983. "Private Discrimination and Social Intervention in Competitive Labor Markets," *American Economic Review,* Vol. 73, pp. 340-47.

Lundberg, S. and Startz, R. 2000. "Inequality and Race: Models and Policy," in K. Arrow, S. Bowles and S. Durlauf (eds) *Meritocracy and Inequality*, Princeton University Press, pp. 269-295.

Marshall, A. 1974. "The Economics of Racial Discrimination: A Survey". *Journal of Economic Literature*, Vol. 12, No. 3, pp. 849-871.

Moll, P. 1992. 'The Decline of Discrimination Against Colored People in South Africa, 1970-1980', *Journal of Economic Development* , Vol. 37, pp. 289-307.

Moll, P. 1995a. 'Discrimination is Declining in South Africa, But Inequality is Not', *Mimeo*, Chicago.

Myers, S., Lange, L. and Corrie, B. 2003. "The Political Economy of Antiracism Initiatives in the Post-Durban round". *The American Economic Review*, Vol. 93, No. 2, *Papers and Proceedings of the One Hundred Fifteenth Annual Meeting of the American Economic Association*, Washington, DC, January 3-5, pp. 330-333.

Neuman, S. and Oaxaca, R. 1998. "Estimating labour market discrimination with selectivity corrected wage equations: methodological considerations and an illustration from Israel", *CEPR Discussion Paper*, No. 1915, London.

Neumark, D. 1988. 'Employers' Discriminatory Behaviour and the Estimation of Wage Discrimination', *Journal of Human Resources*, Vol 23, pp. 279-295.

Oaxaca, R. 1973. "Male-female wage differentials in urban labor markets", *International Economic Review*, Vol. 14, No. 3, pp. 693-709.

Oaxaca, R. and Ransom, M. 1994. "On discrimination and the decomposition of wage differentials", *Journal of Econometrics*, Vol. 61, pp. 5-21. other one also with journal

Phelps, E. 1972. "The Statistical Theory of Racism and Sexism," *American Economic Review,* Vol. 62, No. 4, pp. 659-61.

Rawls, J. 1971. *A Theory of Justice*, Cambridge, Mass.: Harvard University Press, Belknap Press

Riach, P. and Rich, J. "Field Experiments of Discrimination in the Market Place", *The Economic Journal*, Vol. 112, No. 483, pp. F480-F518

Rodgers, W. and Spriggs, W. 1996. "What Does AFQT Really Measure: Race, Wages, Schooling and the AFQT Score," *The Review of Black Political Economy,* Vol. 244, pp. 13-46.

Rospabe, S. 2002. "How did labour market racial discrimination evolve after the end of Apartheid?", *The South African Journal of Economics*, Vol. 70, No. 1, pp. 185-217.

Schwab, S. 1986. "Is Statistical Discrimination Efficient?" *The American Economic Review*, Vol. 76, No. 1, pp. 228-234.

Sherer, G. 2000. "Intergroup economic inequality in South Africa: the post-Apartheid era", *American Economic Association Papers and Proceedings*, Vol. 90, No. 2, pp. 317-21.

Standing, G., Sender, J. and Weeks, J. 1996. "Restructuring the Labour Market: The South African Challenge", ILO Country Review, International Labour Office, Geneva

Steele, C. 1997. "A Threat in the Air: How Stereotypes shape the intellectual identities and performance". *American Psychologist*. Vol. 52, No. 6, pp. 613-629.

Steele, C. and Aronson, J. 1995. "Stereotype threat and the intellectual test performance of African-Americans", *Journal of Personality and Social Psychology*, Vol. 69, pp. 797-811.

Steele, C. and Aronson, J. 1998. "Stereotype threat and the test performance of academically successful African Americans", in C. Jencks and M. Phillips (eds.) *Black-White test score gap*. Brookings Institution Press.

Tajfel, H. 1969. "Cognitive Aspects of Prejudice," *Journal of Social Issues*, Vol. 25, No. 4, pp. 79-97.

Tajfel, H. 1970. "Experiments in Inter-Group Discrimination," *Scientific American*, November, pp. 96-102.

Treiman, D., McKeever, M. and Fodor, E. 1996. "Racial differences in occupational status and income in South Africa, 1980 and 1991", *Demography*, Vol. 33, No. 1, pp. 111-32.

Turner, J. 1978. "Social Categorization and Social Discrimination in the Minimal Group Paradigm," in H. Tajfel (ed) *Differentiation Between Social Groups*, London: Academic Press.

Turner, J. and Brown, R. 1978. "Social Status, Cognitive Alternatives and Intergroup Relations," in H. Tajfel (ed), *Differentiation Between Social Groups*, London: Academic Press.

Vaughan, G., Tajfel, H. and Williams, J. 1981. "Bias in Reward Allocation in an Intergroup and an Interpersonal Context," *Social Psychology Quarterly*, Vol. 44, No. 1, pp. 37-42.