

Social Networks and Wages in South Africa

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Abstract

Although it is a stylized fact that social networks play an important role in job search, their impact on labor market outcomes, namely wages, is still disputed, with both the “good matches” and “limited choices” hypotheses finding support in different contexts (Loury, 2006). This paper presents a simple model of the “referrer’s dilemma” to suggest that individuals with low ability may still be referred to vacancies, in particular if they are socially close to the referrers, triggering wage penalties in some cases. Using data from the Cape Area Panel Study in South Africa, this paper investigates the effect of job search method (in particular, the use of social networks) and social distance (the use of household members and relatives versus friends) on wages for three groups, Black African, Coloured and White youth. Support for the model is found using fixed effects and random effects estimations for the log of hourly pay. For Black and Coloured youths, network use is associated with wage penalties for social proximity (finding a job through a household member or relative) but no significant penalty for non related contacts (friends). For White youth, no significant penalties or premiums are found.

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1 Introduction

An extensive literature, in economics and other social sciences, provides empirical support for two stylized facts about the importance of social networks for the functioning of labor markets.¹ The first is that their use is pervasive (Ioannides and Loury, 2004, Topa, 2011). This is true in developed countries and in developing countries alike². The second is that both the extent and productivity of social network use in the labor market differ according to demographic characteristics, in particular gender and race³.

While the predominant focus of much earlier research has been to identify the extent to which social networks are used in job search, perhaps an issue of greater importance is whether or not the use of social networks affects outcomes in the labor market, in particular wages and tenure, and if they do, for whom. As Mouw (2003) comments, “This is no trivial issue. If using contacts seems to have little overall impact on labor market outcomes, then perhaps economic models of the labor market can safely ignore “embeddedness” . . . without sacrificing explanatory power.” The implica-

¹The use of social networks in this sense refers to job seekers communicating with friends, relatives and acquaintances about employment opportunities and firms using informal referrals and recommendations to find employees.

²For example, Bewley (1999) states that, in the USA, 30-60% of the jobs are found through social contacts. See also Granovetter (1974) and Holzer (1987) for the USA and Bentolila and Suarez (2010) for a recent analysis of the role of social networks in Europe. In developing countries the role of social networks in the functioning of labor markets somewhat is less well documented. See, however, Magruder (2010) and Burns, Godlonton, and Keswell (2010) for evidence regarding the extent of use of social networks in South Africa, Lawler et al. (1995) for a comparison of human resource management practices of firms in India and in Thailand and the extent of use of internal referrals to fill different jobs. And see Calvo-Armegnol and Zenou (2005) for an analysis of the role of social networks in the functioning of the labor market in Egypt.

³See, for example, Bortnick and Ports (1992), Holzer (1987) and Korenman and Turner (1996) for evidence that whites were more successful than blacks in mobilizing contacts in the process of job search

tions of different importance of embeddedness can range from differences in the aggregate unemployment rate (Kuzubas, 2009) to long run inequality between groups, perhaps along race and gender lines (Calvo-Armegnol and Jackson, 2004). The theoretical and empirical literature that addresses the question of whether social networks matter or not can be organized around two competing hypotheses, the “good matches” hypothesis Rees (1966)⁴ and the “limited choices” hypothesis (Loury, 2006).

The “better matches” hypothesis builds on the job matching approach to the functioning of the labor market (Johnson, 1978, Jovanovic, 1979, Viscusi, 1980) and its assumption that not all matches between workers and employers are optimal: prospective workers are heterogeneous in preferences for different types of jobs and in their productivity in those jobs, while jobs are heterogeneous in the skills required and in their non pecuniary characteristics (Johnson, 1978). Uncertainty and imperfect information about any of these may lead some hired workers to be poor matches for the jobs they hold, either because the job seeker misjudges the job or the firm misjudges the employee.⁵

The use of social networks in job search is then seen as an effective method for firms and potential employees to improve the matching process that underlies the recruitment process, while taking into account the

⁴See also Montgomery (1991), Saloner (1985) and Simon and Warner (1992) for formal theoretical treatments of this approach.

⁵A job seeker may misjudge their suitability for a job because many job characteristics cannot be easily ascertained without actual employment experience. Such characteristics include the difficulty of the work for the employee and non-pecuniary benefits of the job such as the social environment of the job. From the firms’ perspective, heterogeneity in unobservable components of productivity related characteristics of workers (such as ability) means that the firm will find it difficult to identify the best person for the job prior to employment.

relatively low search costs (in both time and money) associated with this method of job search (Holzer, 1987). Social networks may be used by firms as a way of obtaining information about potential employees that would be difficult to ascertain through formal recruitment methods.⁶ If the use of job contacts makes it more likely that job seekers and employers will obtain accurate information about each other, then this should impact positively on wages and tenure. For example, in the model proposed by Jovanovic (1979) wages are positively related to tenure. If a job match turns out to be poor, it is more likely that job separation will occur earlier rather than later, when quality of the match becomes apparent to the worker and the employer while longer tenure is a sign that the worker is suitable for the job. Similarly, if they are paid according to their marginal product, wages should be higher on average for those workers that are proven to be productive and consequently have longer tenure. Simon and Warner (1992) extend this reasoning to suggest that wages may be higher from the start of employment for a worker that is referred to the firm as the firm anticipates higher than average productivity. One additional prediction of this hypothesis is that the use of social networks should remain high across time, as suggested by Casella and Hanaki (2008).⁷

The “limited choices” hypothesis, on the other hand, emphasizes that

⁶Several studies that use firm level data on the hiring process have found that applicants referred to firms by current employees had higher rates of receiving job offers than other applicants. See Mouw (2003) for a review and Fernandez, Castilla, and Moore (2000), Roberto M Fernandez (1997), Petersen and Seidel (2000) for examples.

⁷Interestingly, there is evidence that social network use in the labor markets may be increasing: Ioannides and Loury (2004, p.1057), using data from the Current Population Surveys data in the USA for 1970/1971 and 1991/1992, find that 15% of the unemployed used friends and relatives to search for work in the previous month in the 1970/71 data compared to 23% in the 1990/91 data.

there are costs associated with the use of social networks. That is, while they may be used because of convenience and low monetary costs relative to formal methods, they provide the job seeker with a range of job opportunities limited by the characteristics of their social network. These job opportunities may not be suited to the characteristics of the job seeker, unlike the wider range of jobs that are potentially available through formal methods (Bentolila and Suarez, 2010). As a result, wages in jobs found through social networks will be equal to or lower on average, than in jobs found through formal methods. However, as theorised by both (Calvo-Armegnol and Jackson, 2003) and Loury (2006), heterogeneity in the characteristics of social networks may result in the possibility of the limited choices hypothesis being applicable for some job seekers but not for others. In any case, the clearly contrasting wage implications of the limited choices and good matches hypotheses can be used to empirically test between the theories.⁸

Several recent studies have provided support to the “limited choices” hypothesis.⁹ Combining personnel files and job-histories of workers at a man-

⁸It is important to note as Loury (2006) does, that whilst longer job tenure should be the result of good matches it may also be consistent with the limited choices hypothesis and so can not be a definitive test between the theories. Simon and Warner (1992) argue that jobs obtained through contacts with more information (i.e., recruiters or acquaintances inside the firm) lasted significantly longer than jobs obtained through want ads or private agencies and that this is evidence of the benefits of using networks. In contrast however, Topel and Ward (1992) argue that the average young worker holds seven jobs in the first 10 years of his working life and that job mobility accounts for one-third of wage growth during this period. If workers chose to change jobs voluntarily this must be because of having better alternative jobs available and so such job mobility should increase wages. In contrast, young workers that stick with jobs for longer than average periods of time may miss out on opportunities to obtain higher wages. Keith and McWilliams (1995) and Abbott and Beach (1994) show that the effects of job mobility on wages depend on whether the job change was voluntary or involuntary. Both studies find that voluntary separation increases wages while involuntary separation does not.

⁹The label associated with this approach is perhaps unfortunate. The emphasis is on the fact that social networks limit the choices of those who use them, not that those who

ufacturing firm, Antoninis (2006) found that new recruits receive a higher starting wage when recommended to the job by an individual with direct experience of their productivity but that the use of referrals from friends and relatives has no effect on the starting wage and may even be negatively related to wages of workers in unskilled jobs. In contrast, Bentolila and Suarez (2010) found that contacts reduce unemployment duration by 1-3 months on average, but that they are associated with wage discounts of at least 2.5%. Elliot (1999) and Gary Green and Diaz (1999) found that those using networks earned less on average, than those using formal methods. Most recently, Pellizzari (2010) used data from the European Community Household Panel (ECHP) to find that the impact of network search on wages depends on the labor market institutions of a country. He uses difference-in-difference estimates of the Italian liberalization of the labor market to identify that the impact of network search may change as institutions change. Pellizzari (2010) also concludes that penalties and premiums are equally common across the countries in the (ECHP), which is not surprising considering that labour market institutions differ across these countries.¹⁰

Of particular interest in this paper is the idea that different population groups may experience different network effects according to the differences in the characteristics of their networks. There are several demographic differences in the effects on wages of job search through contacts. Korenman and Turner (1996) reported that, among young workers in inner-

use them have limited choices due to some historical disadvantage and are “forced” to use social networks, as the use of formal methods is never ruled out.

¹⁰There have also been several studies that have found no wage effect associated with contact use (Bridges and Villemez, 1986, Holzer, 1987, Mouw, 2003).

city Boston, whites who found jobs through contacts received much larger wage gains (19% higher), than blacks with similar observable characteristics. Smith (2000) showed that gender wage differences were small for those using formal job-search methods. In contrast, she found larger wage differences between Hispanics and whites who used personal contacts to find jobs compared to those who used more formal means. Korenman and Turner (1996) replicated the results on Hispanics for a nationally representative sample of urban youth. Elliot (1999) reported that for less-educated workers, the use of informal contacts results in significantly lower wages.

Using data on contacts amongst a group of Dartmouth college seniors, Mamaros and Sacerdote (2002) found that the students networking with fraternity/sorority alumni were more likely to get better paying and more prestigious jobs. However, the type of contacts used had an impact on the quality of employment found. There were significant gender and race differences. For example, women were less likely to get fraternity/sorority help, more likely to use help from professors and equally likely to get help from relatives. Loury (2006) also finds heterogeneity in network effects according to the gender of the contact with prior generation male relatives having a positive and larger effect than female friends and relatives.

In conclusion, while social networks are widely used and this usage is associated with impacts on wages, neither the good matches or limited choices hypotheses in isolation can explain the range of evidence. In addition, the wage impact may vary systematically according to the characteristics of the job seeker, the characteristics of the contact and the labour market institutions of the country.

The focus of this study is on the variable impact of formal and informal search methods on individual wage rates and, in particular, the possible heterogeneity due to job seeker’s characteristics. In section 2 we motivate our results by paying attention to the motivation of the referrer to provide information to a firm seeking to fill a vacancy, an aspect in this relation that has been frequently ignored or minimized ¹¹. In particular, we suggest that if the referrer has a direct stake in the welfare of the referred, these considerations may trump the adverse consequences on referrer’s reputation of referring a job seeker of low ability that are usually emphasized by the “good matches” hypothesis. Firms may then react to this action by applying a wage penalty that is a positive function of how close the referrer is to the referee. Our predictions are then close, in spirit, to two important studies in this field: Granovetter (1974) work on the strength of weak ties, which emphasizes the positive impact of increased social distance between referrer and referred on labor market outcomes (namely, in his case, finding a job) and Calvo-Armegnol and Jackson (2003) analysis of referrals’ value and its implications for the labor market outcomes for historically disadvantaged groups.

The data we use, the Cape Area Panel Study (CAPS) (Lam, Seekings, and Sparks, 2008), is described in section 3 ¹². The CAPS is a particularly

¹¹In Montgomery (1991) the motivations of the referrer are replaced with the assumption that abilities are correlated across individual members of a network. As Antoninis (2006, p.135) remarks, in criticizing this assumption, “. . . one observes that individuals take active steps to ensure employment for members of their family network for reasons that are often unrelated to whether their relative has a similar level of ability. Employers often respond to such recommendations favorably despite their knowledge that they may have little to do with the new recruits’ productivity potential”.

¹²The Cape Area Panel Study Waves 1-2-3 were collected between 2002 and 2005 by the University of Cape Town and the University of Michigan, with funding provided by

valuable data for this purpose, for two reasons. The first is the wealth of information on respondents' employment outcomes, job search methods, and background, in particular human capital, as well as family background for a large sample of data across several years (2002-2006). The second is the importance of the functioning of the labor market in addressing issues of poverty and inequality in the South African context, a point that we also discuss, briefly, in section 3. In section 4 we present our results. We find that, controlling for human capital and other individual characteristics, in comparison to youths that used formal search methods, the use of relatives and household members in finding employment carries a wage penalty for Black Africans (Blacks) and for Coloureds but no penalty for Whites using household members/relatives. We find that closer social proximity, as a rule, has a negative effect. Also, there is no evidence from this sample of social networks providing any type of wage benefit suggesting that the good matches hypothesis at least in the context of South Africa, is not applicable.

An understanding of the significance of the demographic characteristics of social networks to individual job search outcomes may have important policy implications in the high unemployment context of South Africa. If Black youths are using social networks to acquire jobs even though they are associated with large wage penalties, this may be a sign that labour market institutions or possibly other factors, do not facilitate formal job search for

the US National Institute for Child Health and Human Development and the Andrew W. Mellon Foundation. Wave 4 was collected in 2006 by the University of Cape Town, University of Michigan and Princeton University. Major funding for Wave 4 was provided by the National Institute on Aging through a grant to Princeton University, in addition to funding provided by NICHD through the University of Michigan. Waves 1-2-3-4 are publicly available.

these individuals to find better employment.

2 Theoretical Model: the referrer's dilemma

In this section we present a simple theoretical model with three agents: workers seeking jobs (i), firms (k) wanting to fill vacancies and referrers (j) who work for the firm and know the unemployed worker.

There are two types of workers, high and low ability, α_H and α_L respectively. Ability is unobservable by the firm but is known with certainty by both the worker and her referrer. The worker will accept to work if offered a wage W_i above her reservation wage ($W_r(\alpha_i)$), in which case her utility will be $U_i = W_i - W_r(\alpha_i)$.

The problem of the firm is to maximize profits. Under perfect information regarding worker's productivity, that would be achieved through the usual first order condition of $Y(\alpha_i) = W_i$, where $Y(\alpha_i)$ is the marginal productivity of a worker of type $i \in \{L, H\}$ and $Y(\alpha_L) < Y(\alpha_H)$. In the absence of information about i 's productivity, the firm can obtain information about her productivity by using the information provided by a referrer.

The potential referrer can take two actions (a), when knowing about a vacancy: to "put in a good word" for i ($a = 1$, in which case worker i will get the job, or not to intervene in favor of i ($a = 0$), in which case the worker won't get the job. The objective of the referrer is to maximize his own utility function, written as:

$$U_j(a) = \beta(Y(\alpha_i) - Y(\alpha_H)) + \delta_{ij}U_i(a) \quad (1)$$

The two components of this equation are meant to motivate the possible trade-offs (and dilemmas) facing a potential referrer. To increase his dilemma, we will further assume that for some reason (social norm, legal regulations, bargaining agreements) the firm cannot make a wage offer below $\underline{W} > Y(\alpha_L)$, hence the firm is in fact losing money if it hires a L -type worker.

The first part of equation 1 expresses the penalty imposed on the referrer if the firm hires a L -type worker, given that only H -type workers make a positive contribute to firm's profits. The second part of equation 1 links the utilities of i and j as a function of parameter $\delta_{ij} \geq 0$, a measure of the social distance (however defined) between referrer and the referred. Given the hypothesis of utility maximization, it is immediately obvious that j should choose $a = 1$ if the worker is a H -type. However, there is the possibility of a trade-off between referrers' utility and firms' profit in the case of a L -type worker, in which case the referrer chooses $a = 1$ when

$$\delta_{ij}(U_i(1) - U_i(0)) \geq \beta(Y(\alpha_L) - Y(\alpha_H)) \quad (2)$$

Hence, smaller social distance between referrer and referred implies a greater motivation for j to choose $a = 1$, and “put a good word” for a L -type (in other words, present her as a H -type worker). Knowing this, the firm should discount the wage offer to make to the worker, with the penalty increasing with social proximity between referrer and referred. As formal recruitment of workers can be assumed to be costly relative to hiring through referrals, even if a more productive worker may be found through formal

recruitment, a firm may prefer to hire the referred worker of possibly low ability. Similarly, the referred worker may be willing to accept the job with a wage penalty as they might otherwise have to engage in costly job search to find a better paying job. This very simple model is intended to motivate some of the possible results when we consider a three party relation as in a referrer-mediated wage offer. The model implies that in some situations, referrals may be associated with bad matches, rather than good matches. Possible extensions include the inclusion of variables that influence worker's utility in case she does not get the job - in particular the possible effects of unemployment rates which, in the context of our study, vary widely.

3 Social Networks and Wages in South Africa

In South Africa, apartheid ended in 1994 at the time of its first democratic elections. The legacy of apartheid however, remains quite pronounced, especially in relation to labour market outcomes. South Africa is characterised by marked inequalities in household wealth and income between and within race groups. Overall income inequality is indicated by the consistently high Gini coefficient over the past few decades in South Africa. Using census data, Leibbrandt and Woolard (2001) calculated this is to be 0.68 in 1975 and 0.69 in 1996, relatively high compared to most countries in the world.

As shown by Leibbrandt and Woolard (2001), the key factor underpinning household income inequality is wage inequality, particularly inequality between those households that have no employed individuals and those households that have one or more employed individuals. Also however, for

those with jobs however, there is a substantial difference in earnings according to race Hoogeveen and Ozler (2004). Unemployment in South Africa has been persistently high (especially for Black South Africans compared to other race groups) and has increased in the decade following the end of apartheid, (Kingdon and Knight, 2004, 2007).¹³ In such a context, where income inequality is high, the significance of job search method in generating wage differentials (if any) may be considered as one factor among many that contributes to inequality.

Table 1 presents descriptive statistics by race for a sample of individuals that were working in a job with fulltime hours at the time of interview during the most recent CAPS wave with data available (wave 4, 2006).¹⁴ CAPS focuses on youth in the Cape Area and there are no observations of any Coloured or White respondents over the age 27, or any observations of Black's over the age of 33. Also, the focus of the study on the years of the transition to adulthood (from age 14 to the mid 20's) mean that the proportions of respondents in the labour force and in education change markedly over the 4 waves of the study. Differences between the race groups however, are large across all waves. In other studies of South African youth such as the Umsobomvu Youth Survey (Morrow, Panday, and Richter, 2005), large differences in employment have been found across race groups (in particular a very high rate of youth unemployment- more than 60%, for Blacks com-

¹³At the end of 2010, Statistics South Africa reported unemployment for the last quarter of that year at 24% (defined as individuals aged 15-65 searching for work and not currently working).

¹⁴Hourly pay in Rands was calculated from data on monthly pay and hours worked each month. The sample includes only those participants that provided data on both monthly pay and monthly hours worked.

pared to White and Coloured youths- less than 10%). In this sample, White youths' hourly wages are about three times that of black youths' wages and more than twice that of Coloured youths' wages.

Inequality in earnings between race groups is due in part to systematic differences in education. Specifically, while there are high enrolment rates across all race groups, schooling quality and educational achievement are lower on average, for Black youth (Anderson, Case, and Lam., 1999). The variable quality of education in South Africa is masked somewhat by the fact that there is not a great difference in the mean of years of completed schooling. However, the standard deviation in years of education (measured as the total of school and post school education) is significantly lower for the White sample, as is the minimum years of education for the White sample. Also (though not presented in table 1), there is a substantial difference in the wave 4 data for the rate of tertiary education completion for those employed (39% of Whites , 14% of Coloureds and 10% of Blacks). Direct comparison of literacy and numeracy ability between races is made possible by results to a literacy and numeracy evaluation.¹⁵ The mean test score result for Whites is close to perfect (95%) while it is less than (60%) for blacks. These statistics are not surprising though, and may explain some of the difference in wages between the races.

Apart from differences in education, differences in family background may lead to differences in a range of personal characteristics that are valued in the labour market and likely to be positively correlated with wages. In this

¹⁵The test score variable is for a literacy and numeracy evaluation conducted in the the first wave of CAPS for all participants consisting of 40 questions. All participants were given the same questions.

Table 1: Descriptive Statistics of Employed Respondents in CAPS Wave 4

Variable	Mean	Std. Dev.	Min.	Max.	N
Black Africans					
Hourly pay	10.20	7.49	0.18	68.75	437
Male	0.56	0.50	0	1	443
Age at interview	23.28	2.16	17	33	439
Years of education	10.62	1.94	2	16	420
Literacy & numeracy score	23.08	7.81	0	40	436
Months in current job	13.16	10.73	0	53	441
Formal urban background	0.38	0.48	0	1	441
Family well-off during childhood	0.24	0.43	0	1	443
Family poor during childhood	0.24	0.43	0	1	443
Coloureds					
Hourly pay	16.52	9.07	0.83	67.71	638
Male	0.51	0.5	0	1	733
Age at interview	22.06	2.34	17	27	730
Years of education	10.59	1.82	4	16	725
Literacy & numeracy score	28.84	7.26	6	44	731
Months in current job	19.13	14.46	0	52	729
Formal urban background	0.96	0.19	0	1	727
Family well-off during childhood	0.60	0.49	0	1	729
Family poor during childhood	0.03	0.18	0	1	729
Whites					
Hourly pay	29.57	19.59	4.17	144.44	80
Male	0.53	0.50	0	1	96
Age at interview	22.13	2.04	18	26	96
Years of education	12.04	1.25	7	15	92
Literacy & numeracy score	37.51	5.97	12	45	94
Months in current job	19.87	15.29	1	52	96
Formal urban background	0.95	0.22	0	1	96
Family well-off during childhood	0.88	0.33	0	1	96
Family poor during childhood	0.01	0.10	0	1	96

sample, a higher proportion of white youths report coming from a financially well-off/comfortable background and living mostly in formal urban areas throughout their lives than black youths.¹⁶

While differences in human capital and other family and personal characteristics have been linked to income inequality, a possible factor of importance that remains relatively unexplored is the use of social networks in job search. Magruder (2010) has found that fathers are critical network members for their sons and he argues that this limits intergenerational mobility as the Black youth that can get work are those that have employed parents.¹⁷ To the best of our knowledge, there is no research on the wage impact of social networks in the labour market of South Africa. To begin with though, it is necessary to confirm with CAPS data that social network use does explain how a large proportion of jobs are found. Table 2 presents descriptive statistics for the job finding method associated with all job observations of respondents in waves 2, 3 and 4 of CAPS. It is important to note that each individual may have had up to 8 jobs across this period and that the statistics are percentages of total jobs¹⁸. In this sample, the use of contacts to find work, for Black and Coloured youths, accounts for more than 60% of jobs found whilst for White youths it is only 47%. There are

¹⁶“Family well-off during childhood” is the percentage of the sample that responded either “very comfortable” or “comfortable” when asked to characterise their families financial situation as a child. Likewise, “Family poor during childhood” is the percentage of the sample that responded either “very poor” or “poor” in response to that question. “Lived mostly in formal urban areas” is the percentage of the sample that reported having spent most of their life living in formal urban areas, as opposed to rural or informal urban areas.

¹⁷Also, see Burns, Godlonton, and Keswell (2010) for further evidence in South Africa of the importance of an individual’s social network in job finding.

¹⁸there are an unequal number of observations for each respondent as some had more jobs than others.

Table 2: Job Finding Method for Jobs in Waves 2-3-4

Variable	Mean	Std. Dev.	Min.	Max.	N
Black Africans					
Household member	0.15	0.358	0	1	1183
Relative	0.161	0.368	0	1	1183
Friend	0.339	0.474	0	1	1183
Formal methods	0.349	0.477	0	1	1183
Coloureds					
Household member	0.154	0.361	0	1	2819
Relative	0.166	0.372	0	1	2819
Friend	0.357	0.479	0	1	2819
Formal methods	0.323	0.468	0	1	2819
Whites					
Household member	0.102	0.303	0	1	362
Relative	0.099	0.3	0	1	362
Friend	0.326	0.469	0	1	362
Formal methods	0.472	0.5	0	1	362

three variables used here for the finding of jobs through networks according to the relationship the network member has with the job finder. The job finder had the assistance of or information from either- 1) a household member 2) a relative outside the household or 3) a friend outside the household. These three categories along with the category of “formal methods”, are mutually exclusive. The formal methods category is comprised of the following different search methods: Responding to a newspaper advert, Getting work through an employment agency, Submitting CV’s directly to, or visiting employers or having been in contact with the employer because of past employment with them.¹⁹ Considering the breakdown of categories, the theoretical model can be applied to this data in relation to the differences in outcomes associated between household members and relative, and friends.

¹⁹Observations of self employment, working for the family business, missing observations and the category “other”, have been dropped.

It is assumed that relatives are in closer social proximity to a job seeker than friends, or at least are more likely to have interlinked utility functions. Likewise, even if household members are not related to the job seeker, they are more likely to have interlinked utility functions than friends outside of the household. Thus our model would predict that *ceteris paribus*, compared to using friends outside of the household, finding a job through a household member or through relatives should produce a larger wage penalty, in particular for Black youths as the average wages and employment rate of this group is lower than for Whites and Coloureds (the referrer’s dilemma is likely stronger in a households when alternative job opportunities are limited and this is known by the employer).

4 Empirical Analysis

Firstly, we are interested in estimating a wage equation of the type

$$Y_i = \alpha X_i + \beta_1(R * B) + \beta_2(f * B) + \beta_3(F * B) \dots + \gamma Z \varepsilon_i \quad (3)$$

where Y_{it} is the log of hourly wages of individual i , X includes observed characteristics that are valued in the labor market (in this case gender, years of school education, a dummy for tertiary education, months experience in previous jobs and months experience in current job...), $(R * B)$ is a dummy variable indicating the individual is Black and used a household member to find their job or a relative, $(f * B)$ is a dummy variable indicating the individual is Black and used a friend and $(F * B)$ indicates that the individual

is Black and used formal methods. Similarly, there are job search dummy variables for the same categories for Coloureds and Whites ²⁰. While Z includes the job characteristics of full time hours (at least 36 hrs a month), industry and occupation class.

We estimate the above equation using random effects estimation for a sample of full-time job observations from waves 2 (which was spilt over 2 years), 3 and 4 of CAPS for which there is information on wages, hours worked and the job search method that led to the job. There are multiple observations per respondent across time though the panel is not balanced- there are multiple jobs in a given year for some respondents and no jobs in some years for some respondents. Also, there are sometimes multiple observations for the same job across time periods. There are observations of employment in wave 1 of CAPS but that data is excluded as some important variables such as job search, are coded differently. ²¹

Random effects estimation allows for the comparison of the wage impact of time invariant factors- such as family background with the wage impact of time varying factors such as years of education. Also, random effects estimation is more efficient than the generally preferred fixed effects estimation. This is important to consider as when there is limited variation across time for the independent variables of interest (in this case, job search method), the estimates in fixed effects will suffer from large standard errors. However,

²⁰

$$+\beta_4(r * C) + \beta_5(f * C) + \beta_6(F * C) + \beta_7(r * W) + \beta_8(f * W) + \beta_9(F * W) \quad (4)$$

²¹The CAPS data include a “mega job” table that assigns a unique job number to each job per respondent and records the months in which each job was worked in across waves 2a, 2b, 3 and 4

fixed effects estimations may still be preferred, if according to the Hausman Taylor specification test, the random effects estimations are inconsistent. So, we also estimate a simpler version of the model, that includes only time varying independent variables, using fixed effects estimation. We estimate this equation (5) separately for each race group-

$$Y_i = \alpha X_i + \beta_1 r + \beta_2 f + \gamma Z \varepsilon_i \quad (5)$$

where i , X includes observed characteristics that are valued in the labor market, as above but excluding time invariant variables, (r) is a dummy variable indicating the individual used a household member or relative to find their job, (f) is a dummy variable indicating that the individual used a friend and Z is the same. In what follows, we present and discuss four variations of random effects estimations, and the three fixed effects estimations of the model.

Table 3 presents results for Random Effects estimation of log of hourly pay (in Rands) and includes 3 year dummies²², the job search dummy variables and directly observable characteristics of human capital- total years of school education, post school education, prior work experience and work experience within the job. Interestingly, all the social network variables have negative coefficients (and within each race group are a larger discount compared to formal search). Also, consistent with our model, for all race groups, the largest wage penalty comes from the use of relatives/household members. However, these estimates may suffer from omitted variable bias

²²The co-efficients for these dummies, and for the occupation and industry dummies in the regressions are not reported, in the interests of space.

Table 3: RE Estimation of Log of Hourly Pay 1

Variable	Coefficient	(Std. Err.)
Black, used relative/household	-0.664**	(0.058)
Black, used friend	-0.606**	(0.057)
Black, used formal methods	-0.582**	(0.056)
Coloured, used relative/household	-0.390**	(0.050)
Coloured, used friend	-0.374**	(0.050)
Coloured, used formal methods	-0.316**	(0.050)
White, used relative/household	-0.092	(0.067)
White, used friend	-0.040	(0.058)
Experience in previous jobs	0.011**	(0.001)
Experience in current job	0.012**	(0.001)
Years of Education	0.078**	(0.006)
At least 1 year of post high school education	0.178**	(0.038)
N		4890
Groups		2475

Significance levels : † : 10% * : 5% ** : 1%

as important wage enhancing characteristics may vary systematically across those that use social networks and those that do not. Firstly, the characteristics of jobs may vary systematically across search methods. That is, the wage discounts that appear for network found jobs in in the first estimation may be because of the type of work that social networks connect job seekers to. Using derived data on hours worked per month, we infer which jobs are fulltime and create a dummy variable for full time hours. While CAPS does contain information on occupation and industry, there are a significant number of missing observations which result in 1391 observations being dropped when dummy variables for industry (9 dummies) and occupation (9 dummies) are added (presented in 4, with coefficients for occupation and industry dummies not shown).

While the coefficients of the job search variables do change slightly, it is

Table 4: RE Estimation of Log of Hourly Pay 2

Variable	Coefficient	(Std. Err.)
Black, used relative/household	-0.582**	(0.066)
Black, used friend	-0.551**	(0.065)
Black, used formal methods	-0.423**	(0.065)
Coloured, used relative/household	-0.359**	(0.056)
Coloured, used friend	-0.326**	(0.055)
Coloured, used formal methods	-0.301**	(0.055)
White, used relative/household	-0.164*	(0.073)
White, used friend	-0.124*	(0.063)
Experience in previous jobs	0.011**	(0.002)
Experience in current job	0.014**	(0.001)
Years of Education	0.067**	(0.008)
At least 1 year of post high school education	0.145**	(0.043)
Working full-time hours	-0.328**	(0.026)
Number of Observations		3499
Number of Groups		2040

Significance levels : † : 10% * : 5% ** : 1%

clear that substantial differences between the coefficients for different types of contacts remain (with the differences now being statistically significant for Whites also), and the signs and magnitudes are similar to 3). From this we can conclude that the reason for there being differences in wage outcomes according to job search method is not simply because of difference in the type of jobs found through different search methods. However, this does not discount the the applicability of the theory by Calvo-Armegnol and Jackson (2003) that differences in the average employment characteristics across groups can results in differing labour outcomes because of social network use. For groups with high unemployment and low wage social networks, this may result in a lower reservation wage as there are fewer job opportunities to choose from, and lower wages regardless of job search method

²³. Consistent with the theory of Calvo-Armegnol and Jackson (2003) and the limited choices hypothesis (though not direct evidence of), while more jobs are found through social networks for Blacks compared to Whites, this is clearly not because Blacks can secure higher paying jobs through social networks.

The characteristic of gender is included in the the third estimation presented in 5), but this results in virtually no change in the social networks discounts.

Table 5: RE Estimation of Log of Hourly Pay 3

Variable	Coefficient	(Std. Err.)
Black, used relative/household	-0.586**	(0.066)
Black, used friend	-0.557**	(0.064)
Black, used formal methods	-0.421**	(0.065)
Coloured, used relative/household	-0.353**	(0.055)
Coloured, used friend	-0.329**	(0.055)
Coloured, used formal methods	-0.295**	(0.054)
White, used relative/household	-0.164*	(0.073)
White, used friend	-0.126*	(0.062)
Experience in previous jobs	0.010**	(0.002)
Experience in current job	0.014**	(0.001)
Years of Education	0.070**	(0.008)
At least 1 year of post high school education	0.150**	(0.042)
Working full-time hours	-0.330**	(0.026)
Male	0.135**	(0.026)
Number of Observations		3499
Number of Groups		2040

Significance levels : † : 10% * : 5% ** : 1%

There are several other unobservable characteristics that may be of im-

²³Interestingly, there is a self reported measure of reservation wages in CAPS and on average, reported reservation wages are lower for Blacks than Coloureds, and lower for Coloureds than Whites. However, we do not include this variable in any of the estimations due to likely endogeneity

portance in the determination of wages, those that are related to ability in particular. As outlined by the theoretical model, high ability workers should have no trouble getting referrals from contacts that are aware of their high ability as these contacts do not run the risk of being punished by the firm and may gain from the high productivity worker taking the job. Alternatively though, it is not clear that the distribution of jobs found through networks would be more suitable for high ability workers than through formal methods, as the high ability workers are also likely to have higher education. Low ability workers in contrast, may be less likely to be referred by contacts as social proximity decreases. To account for that, we include, in table 6, the literacy and numeracy test score, as an additional covariate. Although this measure can be far from perfect measure of 'ability', it should largely account for two important components of ability - numeracy and literacy skills.

Also included in the estimation in table 6 are variables for family background and the number of languages spoken by an individual. The quality of an individual's social network is not observable in this study, and this is a limitation common to most of the literature concerning wage effects of social networks. However, the quality of the social network should be related to family characteristics (as this is part of the network), and these characteristics may also have a more direct effect on employment (through market valued characteristics such as social skills, language ability, ...). There is a noticeable reduction in the wage discounts associated with all job search categories of Blacks and Coloureds, indicating that an important component of the wage discounts experienced by these two groups is attributable to them

Table 6: RE Estimation of Log of Hourly Pay 4

Variable	Coefficient	(Std. Err.)
Black, used relative/household	-0.424**	(0.105)
Black, used friend	-0.331**	(0.107)
Black, used formal methods	-0.266*	(0.107)
Coloured, used relative/household	-0.213**	(0.079)
Coloured, used friend	-0.183*	(0.077)
Coloured, used formal methods	-0.160*	(0.076)
White, used relative/household	-0.145	(0.098)
White, used friend	-0.030	(0.086)
Experience in previous jobs	0.010**	(0.002)
Experience in current job	0.012**	(0.002)
Years of Education	0.057**	(0.013)
At least 1 year of post high school education	0.138*	(0.056)
Working full-time hours	-0.334**	(0.037)
Male	0.110**	(0.036)
Log of test score	0.032	(0.026)
Lived mostly in formal urban areas	0.049	(0.065)
Family was well-off in childhood	0.031	(0.040)
Family was poor in childhood	0.004	(0.071)
Mother's years of education	0.006	(0.007)
Father's years of education	0.015*	(0.006)
Number of languages spoken	-0.042	(0.030)
Number of Observations		1883
Number of Groups		1061

Significance levels : † : 10% * : 5% ** : 1%

having lower productive skills than Whites (as measured by test score result and mother’s education). For all race groups however, jobs found through household member are associated with the largest wage penalty, though for Whites the difference is not statistically significant.

Table 7: FE Estimation of Log of Hourly Pay- Coloureds

Variable	Coefficient	(Std. Err.)
used relative/household	-0.107 [†]	(0.060)
friend	0.009	(0.056)
Experience in previous jobs	0.007	(0.007)
Experience in current job	0.004	(0.007)
Years of Education	-0.073	(0.117)
At least 1 year of post high school education	-0.259*	(0.108)
Working full-time hours	-0.337**	(0.050)
Number of Observations		2188
Number of Groups		1216

Significance levels : † : 10% * : 5% ** : 1%

Table 8: FE Estimation of Log of Hourly Pay- Blacks

Variable	Coefficient	(Std. Err.)
used relative/household	-0.434**	(0.135)
friend	-0.103	(0.110)
Experience in previous jobs	0.008	(0.011)
Experience in current job	0.012	(0.010)
Years of Education	0.202	(0.248)
At least 1 year of post high school education	-0.086	(0.238)
Working full-time hours	-0.404**	(0.099)
Number of Observations		763
Number of Groups		550

Significance levels : † : 10% * : 5% ** : 1%

Lastly, tables 7-9²⁴ present results for fixed effects estimations by race

²⁴ According to results for Hausman Taylor specifications tests for these three estimations in comparison to equivalent random effects estimations, these fixed effects estimations are preferred

Table 9: FE Estimation of Log of Hourly Pay- Whites

Variable	Coefficient	(Std. Err.)
used relative/household	-0.019	(0.156)
friend	-0.030	(0.130)
Experience in previous jobs	-0.008	(0.019)
Experience in current job	-0.015	(0.018)
Years of Education	0.159	(0.159)
At least 1 year of post high school education	-0.264	(0.197)
Working full-time hours	-0.304*	(0.125)
Number of Observations		548
Number of Groups		274

Significance levels : † : 10% * : 5% ** : 1%

group. Because the results in table 9 and tables 7-9 are the ones less likely to suffer from omitted variable bias, we concentrate the discussion on these. Firstly, it is clear that there is no evidence to support the good matches story for any of the race groups. When job characteristics and individual characteristics are controlled for, as they are in estimation 4 and the fixed effects estimations, the remaining effect of job search method on wages must be intrinsic to the job search method. As none of the coefficients are positive, for this sample the good matches hypothesis must be rejected. Considering that there is much evidence to support positive wage premiums for social network use (Topa, 2011) and few studies that find wage discounts for several major population groups, this is a significant finding. Also, these results may be related to the strength of weak ties hypothesis (Granovetter, 1983), a popular and debated area of research in sociology.

Secondly, the household member/relative wage discounts identified in the fixed effects estimations for Coloured and Black youths, (just over 10% and 40%, respectively) are quite substantial and contrast to the lack of any sig-

nificant effect of friends. This is interesting considering that recent research, such as Bentolila and Suarez (2010), identify small average wage discounts associated with contact use but do not relate this to social proximity or tie strength (in the terms of Granovetter (1983)). Implicitly, they assume that the relationship between the contact and job finder does not matter for referrals, only the passing on of information about jobs. However, if it were simply the types of occupations found through networks that matter rather than referrals, we would not expect large differences between the network discount according to social proximity and hence our findings suggest that the inferences drawn in Bentolila and Suarez (2010), may be in error. Possibly, the modest wage discounts they identify (less than 3%) may be simply dues to their combination of friends and relatives into one category, masking the strong effect from relatives and the small to zero effect of friends.

In general though, our findings are broadly consistent with the limited choices hypothesis. In accordance with our model, it may be that referrers close to job seekers (ie household members and relatives) are more likely to refer low ability workers. Referrers that “help out” relatives and family to get jobs, do so knowing that alternative job opportunities are scarce for these relatives. The “referrer’s dilemma” model predicts that the closer contacts are to job seekers, the more they would be willing to refer a low ability job seeker. Employers, knowing that youth are more likely to be referred even when they are of low ability, offer lower wages.

Lastly, it is noteworthy that there are substantial differences across the race groups, with no significant effect of the referrer’s dilemma found for Whites. This is possibly because employers know that the White youth re-

ferred do not suffer from limited employment opportunities, as indicated by lower rates of unemployment for Whites than for Coloureds and Blacks. Similarly, the group with the highest rate of unemployment- Black youth, who are most likely to have their relatives' referrals discounted by the firm, suffer the largest wage discounts from jobs associated with these relatives. These results are consistent with similar predictions made by Calvo-Armegnol and Jackson (2003), as discussed earlier.

5 Conclusion

It is well known that social networks play a significant role in labor markets in many countries, including developing countries such as South Africa. However, the significance of this fact for employment outcomes is still not clear. This paper is motivated by the competing hypotheses regarding the effects of social network use on labor market outcomes. In accordance with the growing diversity of findings in the literature, it has been argued in this paper that both wage discounts and wage premiums might be expected depending on context and differences in job seeker characteristics and the relationship between the job seeker and the referrer.

A simple model of the “referrer’s dilemma” was developed to show that both low ability and high ability workers may be referred²⁵. In addition, it was highlighted that the “social closeness” of the relationship, as related to the extent to which utility functions are interrelated, may determine the likelihood of a referral for low ability worker being made. This implies that

²⁵(in contrast to the narrower good matches hypothesis which suggests that referrals should always be of positive value)

wage effects from referrals should vary systematically according to relationship type.

Utilising data from the Cape Area Panel Study (CAPS) of South Africa, the wage effect of contact use has been estimated using both random effects and fixed effects estimations while controlling for individual heterogeneity in characteristics that determine wages, using a range of human capital variables and variables that account for family background, and ability. The results show that there are indeed differences in the wage effect according to relationship type and these are similar across races. Referrals from household members and relatives are relatively less valuable than referrals from friends outside of the household for Black and Coloured youth. Also, Blacks in the sample that used relatives and household members had the largest discount in the sample (fifty percent less than for jobs found through formal methods for blacks). Indeed, the referrers dilemma should be strongest where employers anticipate that that referred individual is a disadvantaged group faced with limited employment choices, as is likely the case more for Black youth than for Coloured and White youth. Future research may benefit from explicitly taking into account social network characteristics in addition to relationship type to shed light on the possible combination of effects that lead to wage penalties for those jobs found through contacts.

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