HAL
open science

Indiscriminate Discrimination: A correspondence Test for Ethnic Homophily in the Chicago Labor Market

Nicolas Jacquemet, Constantine Yannelis

To cite this version:

Nicolas Jacquemet, Constantine Yannelis. Indiscriminate Discrimination: A correspondence Test for Ethnic Homophily in the Chicago Labor Market. 2011. halshs-00587674

HAL Id: halshs-00587674

https://shs.hal.science/halshs-00587674v1

Submitted on 21 Apr 2011

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Documents de Travail du
Centre d'Economie de la Sorbonne

CES Working Papers

Indiscriminate Discrimination : A correspondence Test for Ethnic Homophily in the Chicago Labor Market

Nicolas JACQUEMET, Constantine YANNELIS

2011.13

Maison des Sciences Économiques, 106-112 boulevard de L'Hôpital, 75647 Paris Cedex 13
http://centredeconomiesorbonne.univ-paris1.fr/bandeau-haut/documents-de-travail/
ISSN : 1955-611X

Indiscriminate Discrimination: A Correspondence Test for Ethnic Homophily in the Chicago Labor Market *

Nicolas Jacquemet† Constantine Yannelis‡

February 2011

*We wish to thank Kevin Lang, Yannick L'horty, Phillip Oreopoulos, Amine Ouazad, Marie-Anne Valfort and participants to various seminars for useful comments on a preliminary version of the paper.

†Paris School of Economics and University Paris I Panthéon–Sorbonne. Centre d'Economie de la Sorbonne, 106 Bd. de l'Hôpital, 75013 Paris, France. Nicolas.Jacquemet@univ-paris1.fr.

‡Department of Economics, Stanford University, 579 Serra Mall, Stanford, CA 94305-6072. yannelis@stanford.edu.

Documents de Travail du Centre d'Economie de la Sorbonne - 2011.13

Abstract

The extent of racial discrimination in the labor market is now clearly identified, but its nature largely remains an open question. This paper reports results from an experiment in which fabricated resumes are sent to help-wanted advertisements in Chicago newspapers. We use three groups of identical resumes: one with Anglo-Saxon names, one with African-American names, and one with fictitious foreign names whose ethnic origin is unidentifiable to most Americans. We find that resumes with Anglo-Saxon names generate nearly one half more call-backs than identical resumes with African-American or Foreign names. Resumes with non-Anglo-Saxon names, whether African-American or Foreign, show no statistically significant difference in the number of callbacks they elicit. We also find that discrimination is significantly higher in the Chicago suburbs – where ethnic homogenity is high – as opposed to the city proper. We take this as evidence that discriminatory behavior is part of a larger pattern of unequal treatment of any member of non-majority groups – *ethnic homophily.*

Keywords: Correspondence testing, Racial discrimination.

JEL Classification: J71, J64.

Résumé

Si l'ampleur de la discrimination raciale sur le marché du travail est désormais clairement identifiée, la question de sa nature reste encore largement ouverte. Cet article présente les résultats d'une expérience au cours de laquelle des CV sont envoyés en réponse à des offres d?emploi parues dans les journaux de Chicago. Nous utilisons trois groupes de CV identiques: les premiers portent un nom à consonance anglo-saxonne, les deuxièmes un nom à consonance afro-américaine et les troisièmes un nom fictif à consonance étrangère mais dont l'origine ethnique n'est pas clairement identifiée par la population Américaine. Nos résultats montrent que le taux de réponses positives obtenu par les candidatures portant un nom à consonance anglo-saxonne représente près d?une fois et demie celui qu?obtiennent des candidatures identiques, mais dont les noms sont à consonances afro-américaine ou étrangère. Le succès des candidatures portant des noms à consonance non anglo-saxonne, afro-américaines ou étrangères, est statistiquement identique. Nous constatons en outre que la discrimination est significativement plus élevée dans la banlieue de Chicago - où homogénéité ethnique est élevée - par opposition au centre-ville. Ces résultats suggèrent que les comportements de discrimination sont reliés plus largement à une inégalité de traitement à l?égard de tout individu qui n?appartient pas au groupe majoritaire.

Mots-clés: Expérience de testing, Discrimination raciale.

1 Introduction

Discrimination against specific racial and ethnic groups has been robustly substantiated in different countries (Riach and Rich, 2002). In the United States and other Western countries, affirmative action programs are in place in government, academic and even corporate institutions to counter the adverse effects of racial discrimination. For obvious practical reasons, programs and classifications limit themselves to traditional racial categorizations, focusing on established minority groups.[1] Such policies, however, are only well designed if discrimination is directed against specific minority groups due to historical, cultural and social factors. If discrimination is rather directed against *all* non-majority groups – what we call *ethnic homophily*, based on the similarity of this phenomenon with the identified driving forces of network formation (e.g., Currarini, Jackson, and Pin, 2009) – affirmative action programs will fail to accurately restore equality of opportunity, since a substantial proportion of those affected adversely by discrimination may not be receiving benefits from programs enacted to counter discrimination.

In both political science and economics, a growing strand of research highlights the implications of cultural heterogeneity on individual behavior and group ability to achieve efficient outcomes (e.g., Miguel and Gugerty, 2005; Putnam, 2007; Habyarimana, Humphreys, Posner, and Weinstein, 2009; Alesina and Ferrara, 2005, for a survey). The primary finding from these studies is that it is ethnic diversity *per se* that drives interactions between members of different ethnic groups. Economic research on ethnic diversity in the labor market has focused on identifying and accounting for discrimination against pre-established groups with a history of discrimination, such as African-Americans in the United States or Asian immigrants in Canada (Bertrand and Mullainathan, 2004; List, 2004). Most of these studies use the same methodology – correspondence testing, which is conducted by sending resumes that differ only in the name of the applicant. Strikingly, several correspondence tests targeting diverse groups in different countries have found similar levels of discrimination. As noted by Bendick (2007), this may suggest observed discrimination arises because of employers' reluctance to hire people who differ from their "ideal", rather than hostility towards a specific group.

This paper reports results from an experiment designed so as to assess the extent of ethnic homophily in the labor market. We rely on a correspondence test involving three different groups of names: Anglo-Saxon, African-American and "Foreign" names with no clear ethnic association. The perceived ethnic origin of each set of names is established through a pre-experimental survey. We rule out potential gender bias by only using names that are clearly identified as female. Three resumes, that only differ in the identified ethnic origin of the applicant, are sent to employers posting vacancies in Chicago and its suburbs – allowing a precise comparison with Bertrand and Mullainathan (2004) results. Our results unambiguously support the existence of ethnic homophily.

[1] For instance, the 2000 Census Equal Employment Opportunity data tool offers statistics on prescribed racial and ethnic groups, White, Black Hispanic, Asian, Native Hawaiian Other Pacific Islander, AIAN. The University of Michigan, a public institution, gave members of under-represented ethnic groups such as African-Americans, Hispanics, and Native Americans, a 20-point bonus out of 150 on their numeric admissions system before Gratz vs. Bollinger ruled this system unconstitutional.

We find that Foreign names are nearly as much discriminated against as are the African-American names, eliciting a third fewer call-backs than names identified as Anglo-Saxon.

2 Prior research on ethnic discrimination in the labor market

2.1 Economic Models of Discrimination

Economic models have traditionally focused on two mechanisms, taste-based discrimination and statistical discrimination.[2] Taste-based discrimination posits that members of the majority prefer candidates of their own background. According to the original formulation due to Becker (1971), white populations have a general "distaste" for minorities. Employers thus have some given preference for one group over another. The model is taste-based in the sense that no explanation is given for employers' inherent disutility for black labor. Goldberg (1982) reframes Becker's theory of taste-based discrimination as a theory of nepotism. Instead of employers having a disutility for hiring black workers, employers gain utility from hiring white workers. This disutility now measures the extent of nepotism – *i.e.* white employers' preference for hiring white workers.

The theory of statistical discrimination was initially proposed as an alternative to the theory of taste-based discrimination. Discrimination is statistical in the sense that differences between groups are used by employers to distinguish between individuals. Arrow (1973); Phelps (1972) formalize statistical discrimination as a response to imperfect information: employers use signals, such as race and ethnicity, to infer about other individual attributes such as productivity, educational attainment or language skills. Assuming a risk neutral employer, Arrow lists three assumptions necessary for employers to discriminate: *(i)* employers must be able to distinguish between workers of various races at a low-cost, *(ii)* employers must incur some cost before a worker's true productivity is determined, and *(iii)* employers must have some preconception of the distribution of productivity between the categories of workers. Since beliefs about the mean qualities of various groups are then used to make statistical inference about applicants' attributes on hiring decisions, discrimination arises. Note, employers are only concerned with hiring the best candidate, and do not have any intrinsic preference for one type of worker over another.

The existence of ethnic homophily would not necessarily lend support to the adoption of either a taste-based or a statistical model of discrimination. The phenomenon would rather provide interesting refinements of either model. The existence of general ethnic homophily supports one of two hypotheses: *(i)* in the framework of a taste-based discrimination model, the existence of taste based discrimination against non-majority groups or a taste based model in which nepotism is rewarded akin to that of Goldberg (1982) ; *(ii)* in a model of statistical discrimination, employers infer bad characteristics on applicants for whom the ethnic origin is uncertain.

[2] We restrict ourselves to a brief presentation of the literature. See Lang and Lehmann (2010) for a detailed survey of both existing theories and their empirical relevance.

2.2 Empirical evidence of discrimination in the labor market

Early literature used audit studies to attempt to measure racial discrimination. In audit studies, actors are thrown into real world social and economic situations, such as job interviews. Researchers observe the differences between two individuals who are nearly identical in all aspects with the exception of race, and then measure their performance. Most of these studies find that minority actors tend to perform worse in the hiring process (see Riach and Rich, 2002, for a survey of the literature). Audit studies have several major drawbacks. First, they are tremendously expensive. Second, due to the aforementioned factor, sample sizes tend to be small. Third, since the actors know that they are in a study, there is some speculation that minority participants in audit studies would have psychological motivation to underperform (Bertrand and Mullainathan, 2004). Fourth, due to the nature of social interactions and infinite human variability, there will always be immeasurable differences between two actors other than race.

Correspondence testing, first developed in the United Kingdom by Jowell and Prescott-Clarke (1970), overcomes most of these issues. The experiment consists of sending out written requests for job offers, with variations in the applicants' name. The method is much cheaper than audit testing and many laboratory experiments, thus allowing for larger sample sizes. It also gives the researcher nearly complete control over confounding factors in the experiment since the design relies only on paper applications which differ in highly controlled ways. The main weakness of correspondence testing is that differences in job offers cannot be measured directly since companies generally have multistage recruiting processes, which eventually require personal interviews. Thus correspondence tests may under or overstate the level of discrimination for actual job offers, since success in job search is measured by callbacks rather than actual offers.[3]

To our knowledge, the first major correspondence test in the United States on discrimination is due to Bertrand and Mullainathan (2004), which elicited a wealth of similar studies. Their field experiment attempts to measure racial discrimination against African-Americans in two major American cities, using names as a marker of ethnic origin and the percentage of callback offers received as a measure of discrimination. Resumes with African-American sounding names elicit 50% fewer callback offers than the resumes with white sounding names. Using data on social background and name specific call-back rates, they also find little evidence of inferring social class from names – pointing to racial discrimination rather than discrimination based on social class. Last, they find a "marginally significant" but "extremely small" relationship between employers being located in postal codes with a higher percentage of African-Americans and call-backs for African-Americans. It is worth noting that this relationship is statistically significant for their data in Chicago.

Other studies find similar results in alternative labor markets. In Australia, Booth, Leigh, and Varganova (2010) rely on Anglo-Saxon, Indigenous, Italian, Chinese and Middle Eastern names, and find statistically significant evidence of discrimination. They also find significantly less prejudice against Italians, a more established immigrant group in Australia, as opposed to less established

[3] There are also ethical concerns, as sending out fake resumes or letters is a form of deception. See Riach and Rich (2004) for a discussion.

groups like Chinese and Middle Easterners. Bursell (2007) applies a similar methodology in the Swedish labor market, sending out resumes with either Arabic names or names from the Horn of Africa region, and finds that a person with similar characteristics but an Arabic or African name would have to apply to twice as many jobs in order to obtain a callback offer.

Oreopoulos (2009) conducts a field experiment with over 6,000 resumes to examine discrimination against immigrants in the Canadian province of British Columbia. The resumes contrast English-named job-seekers with Canadian education and experience to similar candidates with Chinese, Indian, British and Pakistani names. A computer program randomizes various resume characteristics such as experience, time spent in Canada and the location where a bachelors degree was completed. This rich set of treatment variables leads to very detailed results relating discrimination to the social distance between applicants and the members of the dominant group. The four main results of the study are *(i)* English-named applicants with Canadian education are more than three times as likely to be offered an interview than Chinese, Indian or Pakistani-named applicants with foreign work experience, but there is no significant difference with British applicants, *(ii)* employers value experience in Canada much more than they value foreign experience, *(iii)* for resumes with substantial Canadian experience, whether the applicant has a Canadian degree or not has no effect on call-back offers, and *(iv)* Canadian applicants that differ only by name have substantially different call-back rates – English-named Canadians receive almost one and half times as many call-back offers as those with Chinese, Indian or Pakistani names. This rate is quite similar to that found in Bertrand and Mullainathan between whites and African-Americans in the US.

Giuliano, Levine, and Leonard (2009) study the effect of manager race on the race of new hires using data from a large U.S. retail firm. They find that black managers tend to hire more blacks and fewer whites than non-black managers, and that Hispanic managers in areas with large Hispanic populations tend to hire more Hispanic workers. Giuliano, Levine, and Leonard discuss several possible explanations for their results, including the possibility that some workers have taste-based racial preferences, or nepotism, for members of their own group. In the same spirit, Duguet, Léandri, L'Horty, and Petit (2007) observe that applicants with family names of North African origin with Gallicized first names face substantially less discrimination amongst French employers than applicants with both North African first and last names, almost eliminating the difference in call-backs.

Overall, field experiments show robust evidence for the existence of discrimination in the labor market against diverse ethnic groups in a wide range of countries.[4] Despite the different dates, ethnic groups used and geographic regions, most studies find strikingly similar differences in callback rates between majority and minority groups – from 30% to 50% fewer callbacks for the minority group in each case – and provide evidence that such discrimination is induced by race or ethnic origin

[4]Some recent studies substantiate the existence of ethnic discrimination beyond the labor market. Correll, Park, Judd, and Wittenbrink (2002) use a videogame to demonstrate that subjects are quicker in deciding not to shoot an unarmed white target as opposed to an unarmed African-American target. Based on survey and audit data, Ayres, Vars, and Zakariya (2005) show that African-American cab drivers receive smaller tips than their Anglo-Saxon counter-parts. List (2004) uses evidence from the sports card trading market, and finds evidence of discrimination on both sides, although "consumer-side" discrimination is more pronounced than "seller-side" discrimination.

rather than social class. Our experiment aims to test this hypothesis directly, by introducing a set of names which is clearly identified as non-majority, but is not associated with a particular ethnic group.

3 Experimental Design

We assess the existence and extent of ethnic homophily in the labor market, drawing heavily on the methodology of past experiments such as Bertrand and Mullainathan (2004) and Oreopoulos (2009). We create a bank of resumes and use them to answer job advertisements in the greater Chicagoland area. We use call-back rates as a binary measure of discrimination.

3.1 Set of names

The experiment relies on three sets of names. As a benchmark, we used one set of Anglo-Saxon sounding names and one set of African-American sounding names. We use different data sources in choosing first and last names for these sets. The bank of Anglo-Saxon and African-American first names is built using the names from the Bertrand and Mullainathan (2004) study which received the highest call-back rates. The frequency data for first names was taken from Chicago, measuring names given to babies born into different ethnic groups between 1974 and 1979. For last names, we used frequency data from the US census indicating the most common last names among US racial groups to provide us with a bank of Anglo-Saxon and African-American family names. In assigning Anglo-Saxon last names we choose the most common family names for whites in the US according to the census. We also use US Census data indicating the most common African-American family names to assign African-American last names for our study, however we do not use any last names that are in the top 10 most common names for both white and African-American families.[5]

Our main treatment variable is the third set of names, which consists of names that are not clearly identifiable to Americans. A set of names is first created by randomly mixing first names from ethnic groups in the Balkans and Caucasus. We hypothesize that Chicago employers would be unable to recognize the origin of these names, and would simply determine them to be foreign and unfamiliar. In order to ascertain that the general population does not have any prior associations with these names, a survey was conducted using Illinois college students. Although a survey of members of human resource departments in various Chicago companies might be a more accurate measure of our sample's biases, we use college students for two reasons. The first is ease, as it is much simpler to arrange a survey of college students. The second is that we worry about biasing the results of our experiment – it is plausible that the members of human resource departments in Chicago will see the names in the survey again at later stages of the experiment once resumes are sent out. We thus assume that Chicago employers and Illinois students have similar abilities in determining the origin of names.

[5] We used the Cook County Municipalities and Demographics survey, available from the Census Bureau at `www.census.gov`.

Table 1: Origins guessed from the initial survey

Anglo-saxon names			**Afro-American names**		
	Correct guess	Male		Correct guess	Male
Kristen Smith	100	0	Ebony Williams	84	1
Carrie Johnson	100	0	Latoya Brown	82	1
Meredith Miller	99	0	Tanisha White	85	1
Sarah Davis	100	0	Jasmine Washington	82	0
Laurie Anderson	99	0	Lakisha Jones	85	1

Foreign names

	Guesses		Perceived origin among guessing respondents					
	Unknown	Male	1st Most Com.		2nd Most Com.		3rd Most Com.	
Dziella Lousaper	86	1	French	55	German	9	Spanish	9
Edona Sanatroug	85	3	German	27	Russian	10	Chinese	10
Sofiko Kushtrim	78	23	Russian	36	Indian	7	Dutch	7
Aferdita Dzaghig	75	11	Indian	17	African	6	Asian	6
Gadarine Besnik	75	11	Russian	33	Polish	27	Turkish	20

Note. Origins elicited through the initial survey for the three sets of names included in the study. *Upper part*: share of correct guesses of both origin and gender for each name included in the Anglo-Saxon set and in the African-Amercian set.*Bottom part*: Results from the initial survey for the five names most often identified as from unknown origin. The first column shows the percentage of respondents leaving the field blank or filling in a question mark when asked to identify the ethnic origin of the given name, the second column provides the number of respondents who declared that the name was female. The ethnic group and frequency (computed among those who actually provided a guess) are displayed for the first, second and third most common guess respectively.

The survey mixes the Foreign sample of names with clearly identifiable Anglo-Saxon, African-American and other ethnic names. Survey respondents are asked to indicate to what group, if any, they associate the names. Respondents are also asked their guess for a gender associated to the name. One concern in identifying the names as foreign was to rule out random guesses of origins. We thus throw out for further use in the study any Foreign name for which more than a quarter of respondents identify the name with a particular group. Table 1 displays the results of the initial survey as regards the set of fifteen names (five for each origin) used in the study. The upper part of the Table displays both perceived origin and perceived gender of Anglo-Saxon names and African-American names. In both regards and for both ethnic origins, the very high rates of correct guesses confirms *ex post* the strategy used to choose names: their high frequency in their corresponding origin suggests very accurate perceptions.

The bottom part of the Table provides a more detailed report of answers elicited as regards the five names most often identified as from unknown origin. The first two columns show the gross results of the survey: the share of respondents that are unable to associate any origin to the name (leaving the field blank or putting a question mark) and the share that do not identify the name as female.[6] A potential hazard to our study is that in the set of foreign names, employers may be projecting their own beliefs on various names. While highly unlikely, it is not beyond the realm

[6]The full results are available from authors upon request.

of possibility that in this case we are measuring extremely high rates of discrimination against other groups to which a minority of employers identify the names. To shed some light on the likelihood of this effect, the rightmost part of the table provides the guesses of respondents that did not classify the names as unknown. We observe highly diverse perceived origins for each name, with only one of them (Dziella Lousaper) being identified to the same origin by more than half the respondents who provide a guess. The Table also indicates that in general the names are not associated with non-white groups, making it unlikely that race was a factor in accounting for any observed discrimination. Based on this result, we consider that foreign names are not identified by the general Chicago population with any specific minority group.

3.2 Elicitation of employers' responses

The experiment was carried out between August 20 and February 28 in 2010 in Chicago, Illinois. We responded daily to job advertisements in the two major Chicago-area newspapers: the *Chicago Sun-Times* and the *Chicago Tribune*. Two screening rules are applied to answer advertisements in the study. First, we sought occupation categories that would not be heavily impacted by the 2008 financial crisis in order to have more call-backs. This led us to restrict offers to the fields of Health-care, Accounting and Information Technology. We moreover responded to any advertisements that did not require personal appearances or telephone calls, and to which we had not already responded. We record the name of the employer, job title, the area of the company, any specific requirements indicated in the advertisement, whether or not the ad states that the company is an equal opportunity employer, whether or not the job is a government job, the date of the advertisement and where the company is based.

To design the applications, nine resumes (three for each field included in the study) of actual job seekers in the relevant geographic area – Chicago and surrounding suburbs, comprising the greater Chicagoland area in Illinois, Wisconsin and Indiana – are submitted to job vacancy ads online.[7] The resumes are modified to retain anonymity. We alter the names of various companies and educational institutions at which the job seeker has spent time, and we replace them with similar institutions in terms of standard qualitative rankings. Three resumes were sent to each advertisement: one with an Anglo-Saxon sounding name, one with an African-American sounding name and one with a Foreign name that should not be readily identifiable to the general populace. We cycle resumes – *i.e.*, an equal number of each resume is associated with every set of names – to control for any biases in the perceived quality of the resumes. Resumes may be altered slightly to fit a particular advertisement, for example a particular skill may be added if it was requested in the advertisement. These alterations only occurred in the event that a specific skill was required in the job advertisements, and each resume sent out received the same alteration. Addresses were not included on the resumes to limit location-based inferences about the social class of the applicant. This should not lead employers to treat our applications differently, since initial correspondence for job offers is primarily done via phone and email.

[7] We use resumes posted on `www.bestsampleresumes.com`.

Table 2: Comparison with previously observed discrimination

	Ethnic Origin	Call-Back rate	Discrimination ratio	Job offers Sectors	Job offers Location
This study	White	23.0	1.00	Accounting,	Chicago
	Black	15.8	1.46	Health,	
	Foreign	16.4	1.41	IT	
Bertrand et al. (2004)	White	9.9	1.00	Retail.	US Female
	Black	6.6	1.49	Sales	
Bertrand et al. (2005)	White	8.1	1.00		Chicago
	Black	5.4	1.49		
Booth et al. (2009)	Anglo-Saxon	35.0	1.00	Waitstaff	Australia
	Indigenous	26.0	1.35	Cust. Service	
	Chinese	21.0	1.67	Sales	
	Italian	32.0	1.09	Data Entry	
	Middle East	22.0	1.59	Admin. Finance	
Oreopoulos (2009)	English	15.8	1.00	Sales Prog.	Canada
	Indian	12.1	1.31	Retail	
	Chinese	10.8	1.46		
	Pakistani	11.1	1.42		
	Foreign	11.3	1.14		
Duguet (2007)	French	16.6	1.00	Restaurants	France
	Moroccan	6.0	2.77	Hotels	
	Fr. Surname & Mor. Lastname	10.7	1.55		

Note. Overview of academic studies using correspondence testing to measure ethnic discrimination. The first column indicates the author(s) of the study. The second column lists the ethnic group included. The next two columns provide the callback rates that the ethnic group received along with the ratio of callbacks between minority groups and the majority group – which is the one that appears first in the list of ethnic origins for each study. The last two columns describe the sectors the study examined and the location where the testing was performed.

Past experimental studies have indicated that substantial gender biases exist (see, e.g., Weichselbaumer, 2004; Booth, Leigh, and Varganova, 2010; Bertrand and Mullainathan, 2004), female applicants being more likely to receive a callback offer. The effect is even more pronounced for minority applicants. To control for such biases, we seek to use only female names. However, this raises the obvious question that if the names we use are unfamiliar to Illinois residents, the same may well apply to the gender of these names. First, all of the resumes have some clear indicator of gender, such as a women's achievement award or membership in some sort of women's professional group. We also selected female first names of Albanian, Armenian and Georgian origin to create the Foreign sample of names. Last, we asked respondents of the initial survey to guess whether or not the name was male or female. For all of the names we used (Table 1), more than 90% of respondents either guessed that the name was female or left the field blank, indicating the names, although having unknown origins, appeared to be perceived as either female or unidentified.

Table 3: Identified origins: first names ranked by call-backs

Anglo-saxon names				**African-American names**			
This study		B&M (2004)		This study		B&M (2004)	
Kristen	39.2	Kristen	13.1	Ebony	25.3	Ebony	9.6
Sarah	28.0	Carrie	13.1	Latoya	16.3	Latoya	8.4
Meredith	21.3	Meredith	10.2	Tanisha	16.3	Tanisha	5.8
Carrie	16.7	Sarah	9.8	Jasmine	12.1	–	–
Laurie	12.9	Laurie	9.7	Lakisha	8.0	Lakisha	5.5

Note. Call-Backs elicited by first names from "identified" origins, ranked in increasing order. The data for the Bertrand and Mullainathan (2004) (B&M) study are taken from their Table 8.

4 Results

Table 2 contrasts the callback rates we elicit with those from similar experiments, along with the ratios of callback between the socially dominant group and various minority groups.[8] Two results emerge. First, we observe discrimination against foreign sounding names, which are not identified with any minority group; and the callback ratio is very similar to the one we observe in the benchmark. Second, the difference in call-backs elicited between Anglo-Saxon sounding names and names associated with a clearly identified minority are in line with other experiments across the globe. In particular, our 1.41 callbacks ratio between black and white is very close to the one elicited by Bertrand and Mullainathan (2004), who found 1.49. Note, both studies focus on the same two ethnic groups, in the same geographic area. Results from our benchmark sets of names hence suggest discrimination did not evolve since the 2004 study of Bertrand and Mullainathan.

We present a more precise comparison with existing results in Table 3. We rank the first names used in our study from the highest call-back rate to the lowest, along with an extract of Bertrand and Mullainathan (2004)'s results for the first names we used as well. Our overall callback rates are higher than those of Bertrand and Mullainathan (2004), which can be attributed to the fact that we selected sectors in which there was high labor demand. Strikingly, when the same first names are used, the order in which names received callbacks is nearly the same in both studies. This holds true within both the white and black groups of names. This is even more significant given the fact that there is a statistically significant difference in the within group callbacks for several names.[9] This may suggests that there exists some favouritism for certain given names beyond simple unequal treatment over ethnic groups.

[8] Booth, Leigh, and Varganova (2010) also provide a detailed table of results from various studies not reported here, the results of which are broadly in line with other studies: the ratios range from 1.1 (Greeks in Australia in 1991) to 2.77 (Moroccans in France in 2007).

[9] p-values of the joint chi squared-test of equal means are 0.009 for the Anglo-Saxon group, 0.0559 for the African-American group, and 0.4094 for the Foreign group

Table 4: Experimental Results

Anglo-saxon names			**Afro-American names**			**Foreign names**		
Applications	Callbacks		Applications	Callbacks		Applications	Callbacks	
Kristen Smith (51)	20	39.2%	Ebony Williams (79)	20	25.3%	Dziella Lousaper (55)	9	16.3%
Carrie Johnson (54)	9	16.7%	Latoya Brown (55)	9	16.3%	Edona Sanatroug (86)	9	10.4%
Meredith Miller (80)	17	21.3%	Tanisha White (55)	9	16.3%	Sofiko Kushtrim (89)	15	16.9%
Sarah Davis (75)	21	28.0%	Jasmine Washington (66)	8	12.1%	Aferdita Dzaghig (55)	11	20.0%
Laurie Anderson (70)	9	12.9%	Lakisha Jones (75)	6	8.0%	Gadarine Besnik (45)	10	22.2%
Total (330)	76	23.0%	Total (330)	52	15.8%	Total (330)	54	16.4%

Student t-tests

H_0 : *Anglo-saxon* = *Afro-American*	H_0 : *Afro-American* = *Foreign*	H_0 : *Anglo-saxon* = *Foreign*
H_1 : *Anglo-saxon* $\geq$ *Afro-American*	H_1 : *Afro-American* $\neq$ *Foreign*	H_1 : *Anglo-saxon* $\geq$ *Foreign*
$\hat{t} = 3.1321$, p-value=0.0009	$\hat{t} = 0.2960$, p-value=0.7674	$\hat{t} = 2.8736$, p-value=0.0022

Note. The *bottom part* summarizes final results from the experiment for the Anglo-Saxon set of names (*left-hand side*), the African-American set of names (*middle part*) and the set of Foreign names (*right-hand side*). For each set, the first column provides the name of the applicant along with the number of applications, the second column shows the number and share of applications that received a request for further information or a meeting. The *bottom part* of the Table provides t-tests testing the assumption H_0 of equality in mean callbacks elicited by different ethnic origins, against the alternative H_1.

4.1 Evidence of general ethnic homophily

Table 4 contains a more detailed summary of the results from our experiment, providing call-back rates for each name included in the study (sorted according to the guess rates provided in Table 1), organized by ethnic origin. Overall, Anglo-Saxon names generate far more callbacks than both African-American and Foreign names. Focusing on our baseline sets of names, resumes with Anglo-Saxon names have a 23% call-back rate compared to 16% for African-American. The bottom part of the Table displays the results of t-tests of two by two callback rate comparisons. We strongly reject (with p-value equal to 0.0009) the assumption that callbacks are the same as those elicited by Anglo-Saxon names, against the alternative that applications with Anglo-Saxon sounding names have better odds of obtaining a positive answer. African-American names are very likely to be identified as such by potential employers. Foreign names, by contrast, were intentionally chosen so that they are not associated with any identified group by employers, except for the fact they clearly sound exotic. Based on observed callbacks, we confirm our hypothesis that resumes with such names do face discrimination. On average, applications from this set of names obtain a positive call-back in 16.4% of cases. Again, we strongly reject the hypothesis of equal opportunities with Anglo-Saxon sounding names (with p-value equal to 0.0022): the experiment unambiguously confirms that some discrimination arises from general mistrust against, or uncertainty about non-majority sounding names.

The callbacks elicited by African-American and Foreign names moreover appear strikingly similar. As shown in the middle column of Table 4, the data are unable to reject the assumption of same mean callbacks between the two origins (p-value of 0.7674). Taken together, these two results are clear evidence of discrimination, since the design of the experiment guarantees that resumes are identical except for the perceived origin of the applicant's name: in order to generate the same

Table 5: Discrimination intensity from employers

Equal treatment	**One origin discriminated**			**One origin favored**		
	Anglo-Saxon	Afro-American	Foreign	Anglo-Saxon	Afro-American	Foreign
264	4	10	9	26	8	9
(80%)	(1%)	(3%)	(3%)	(8%)	(2%)	(3%)

Note. The Table reports how employers treated the three applications received from us: equal treatment (callbacks or no answer for all three origins), or favoritism towards one origin (*middle part*) – in the form of a call-back for only one application out of the three – or discrimination against only one origin (*right-hand side*) – in the sense that all names receives a callback except for one application. The first row refers to the number of employers, the second one to the share among all employers that received applications.

number of call-backs, potential applicants with African-American or Foreign names will have to send forty percent more resumes. While this cannot be translated directly into fewer job opportunities – since we have no data on interview success – this puts non-Anglo-Saxon job applicants at a distinct disadvantage in the labor market. The within group variance of callbacks for individual names moreover provide indirect support to variations due to familiarity. The variance appears much greater in the familiar Anglo-Saxon and African-American groups when compared to names in the Foreign group, with which employers are unfamiliar.[10]

Table 5 provides a complementary look at the output from the experiment, focusing on the extent, or lack thereof, of discrimination faced by the various types of applicants. Most employers treat all three applications they received from us in the same way, either calling back all three candidates or disregarding them all. Unequal treatment depending on the name of the applicant hence comes from 20% of all employers included in the study. Note exogenous variations in the quality of the resumes should induce a uniform distribution of employers across the cells of the Table. This is far from what we observe. There is some evidence of discrimination directed towards one group. Out of the three resumes sent that do not receive a callback, 23 employers exhibit such behavior: 4 exclude the Anglo-Saxon applicant, 10 exclude the African-American applicant and 9 exclude the Foreign applicant. This phenomenon is much more pronounced if we look at those employers that call back only one applicant out of the three: among discriminating employers, nearly two-thirds (26 out of 43) give a callback to the Anglo-Saxon name only and disregard any exotic sounding name. This represents three times the number of employers that favor only either the African-American or the Foreign application. Again, we observe equal treatment of African-American and Foreign sounding names.

Table 6 disaggregates the results according to the field of the job and the geographic location of the employer. Since we send three resumes to each ad, we have the same number of applications from each origin in each field (the number of applications appear in parenthesis in each column's title). Whatever the field, Anglo-Saxon applications receive the larger share of call-backs. Fields are ranked according to the discrimination ratio between the Anglo-Saxon and the non Anglo-Saxon

[10]The p-value of the joint chi squared-test of equal means between names is 0.4094 within the Foreign group, while the differences are significant in both other groups.

Table 6: Callbacks by field, location and guesses

	Overall	Field of the job			Employer location		Correlation with guesses		
		Account. (135)	Nursing (106)	Prog. (89)	Chicago	Suburbs	Overall	Chicago	Suburbs
Anglo-Saxon	0.230	0.267	0.198	0.213	0.202	0.257	0.586	0.253	0.773
Afro-American	0.158	0.156	0.151	0.191	0.159	0.156	-0.310	0.161	-0.368
Foreign	0.164	0.178	0.113	0.180	0.159	0.168	-0.832	0.566	-0.350
Overall	0.184	0.200	0.154	0.195	0.174	0.194	0.349	0.079	0.139

Note. For each origin in raw, the first column recalls the overall call-back rates elicited by the corresponding applications. The next three columns provides the call-backs by field of the job offer (total number of applications appears in brackets in the title of the column): accounting, nursing, programming. The next two columns distinguish call-backs based on the geographic location of the potential employer. The last three columns report the correlation between call-backs and the correct guesses of origin for the corresponding name we elicited in the survey.

sounding names. While the discrimination ratio is quite large in accounting, we observe almost no difference between ethnic origins for applications in programming occupations. This difference is very unlikely to be explained by differences in tightness across occupations-specific labor markets.[11] One difference between the programming sector and both accounting and nursing is that employees in the programming sector are less likely to be in direct contact with customers.

To explore further potential heterogeneity in employer's behavior, the right-hand side of Table 6 distinguishes callbacks elicited by each origin depending on the location of the potential employer. Using a t-test, we cannot say that call-backs are significantly lower for Anglo-Saxons as opposed to other groups in the city of Chicago (the p-value for equal means with non-Anglo-Saxons is .1710), while we can say that call-backs are significantly higher for Anglo-Saxons than other groups in the suburbs – p-values of t-test of equal means are .0055 against non-Anglo-Saxons, .0032 against African-Americans and .0092 against foreign names. Last, we cannot definitively say whether or not there is a statistically significant difference between callbacks for members of the African-American sample and the exotic sample in either the city of Chicago or the Chicago suburbs – the respective p-values of equal means t-tests are .9859 for Chicago, .6623 for suburbs. Once we break down the results by geographic area, nearly all of the discrimination that we see hence comes from employers in the Chicago suburbs as opposed to the city center.

Such a correlation between suburbanization and discrimination is consistent with the sociology induced by the historical development of suburbs in the United States. The impetus for the expansion of many Chicago suburbs is that former city residents fled the city center once non-white ethnic groups moved into Chicago. This phenomenon of "white flight" – white families choosing to leave an area once black families begin to move in – is well documented in the sociological literature in the United States (Crowder, 2000). As a result, whites are a plurality with 37.6% of the population

[11] According to the 2009 Occupational Employment Statistics from Bureau of Labor Statistics, the unemployment rate is 4% for computer programmers and interactive media developers, 2.9% for nurses and 2.2% for accountants, while it is 7% on the average for professional occupations.

in the city of Chicago, whereas whites are 78.1% of Cook County excluding Chicago.[12] Whites are thus more prevalent in the Chicago suburbs when compared to the city of Chicago itself, which is extremely diverse and in which no racial group has an absolute majority. What is more, many residents of suburbs who moved there due to the "white flight" phenomenon live in the suburbs precisely because they wanted to live in communities made up primarily of their own ethnic group. Self-selection into geographic areas may hence reinforce favouritism towards the dominant ethnic group in the suburbs.[13]

The last three columns of Table 6 provide spearman rank-order correlations of callbacks with the guesses elicited in the survey as regards the ethnic origin of the name. The correlation is positive for Anglo-Saxon sounding names. Note, however, that all guesses are very high for this set of names, so correlations for this group are computed on very thin variations. For the non Anglo-Saxon groups, by contrast, the correlations are negative: the higher the rate of respondents identifying the name as either African-American or Foreign, the lower the number of call backs the name elicits. Comparing these correlations according to the location, we again confirm strong differences between suburbs and the city proper: while correlations are quite similar across all ethnic groups in Chicago, there is a clear contrast between Anglo-Saxon and non Anglo-Saxon sounding names in the suburbs.

4.2 Summary of the results

We assess the overall significance of our results using Probit regressions on callbacks. Table 7 shows the results from several specifications. The main variables of interest are dummies for the origin of the applicant. In all estimated equations, we include controls for employers and job offers characteristics. We use dummy variables indicating whether a bachelors degree, certification or experience is mentioned as a necessary prerequisite for the job, and whether the vacancy advertisement states that the company is an equal opportunity employer. Last, we include a measure of the ethnic diversity of people living in the geographic location of the employer, through the percent of African-Americans living in the geographic area in which the job is located. The data was collected at the city or town level from the US Census American Community Survey in 2009.

The first model contrasts callbacks of Anglo-Saxon sounding names with the other two origins, and the second one estimates separately the effect of African-American sounding names and Foreign sounding names. Both regressions confirm our main result, with higher significance levels. Having an Anglo-Saxon name has a positive effect on eliciting a call-back and both other origins are negatively correlated (with comparable marginal effects) with callbacks. Models *(3)* and *(4)* explore the differences between locations, through the interaction with a dummy variable for employers in Chicago. Both estimation results are conditional on the ethnic diversity of the location, defined

[12] Our source is the US Census. Note, these numbers include Hispanic whites, who are also considered a separate minority group. If we consider only non-hispanic whites, whites make up 30.6% of the city's population, being the second largest ethnic group after non-Hispanic African-Americans at 34.7% of the population.

[13] It is worth noting that Bertrand and Mullainathan failed to find any relationship between zip-codes and the percentage of African-Americans in that zip-code. However, zip-codes may not be the best proxy to measure racial differences in areas as the postal zip codes do not really measure any real boundaries between community zones in Chicago.

Table 7: Probit regressions on callbacks

	(1)		(2)		(3)		(4)		(5)	
	Coeff. (p-val.)	Marg. Effect	Coeff. (p-val.)	Marg. Effect	Coeff. (p-val.)	Marg. Effect	Coeff. (p-val.)	Marg. Effect	Coeff. (p-val.)	Marg. Effect
Constant	-0.991	-0.100	-0.738	-0.431	-0.986	-0.998	-0.651	-0.661	-0.967	-0.823
	(.000)		(.000)		(.000)		(.000)		(.000)	
Anglo-Saxon	0.254	0.253	–	–	0.336	0.336	–	–	0.344	0.346
	(.008)				(.012)		–	–	(.019)	
African-American	–	–	-0.267	-0.026	–	–	-0.359	-0.361	–	–
			(.018)				(.022)			
Foreign	–	–	-0.242	-0.240	–	–	-0.313	-0.312	–	–
			(.031)				(.045)			
Chicago	–	–	–	–	-0.009	-0.025	-0.201	-0.181	–	–
					(.940)	–	(.196)	–		
– × *Anglo-Saxon*	–	–	–	–	-0.173	-0.175	–	–	–	–
					(.370)			–		
– × *Afro-American*	–	–	–	–	–	–	0.198	0.198	–	–
							(.328)			
– × *Foreign*	–	–	–	–	–	–	0.153	0.149	–	–
							(.496)			
Programming	–	–	–	–	–	–	–	–	0.072	0.083
									(.610)	
– × *Anglo-Saxon*	–	–	–	–	–	–	–	–	-0.244	-0.248
									(.302)	
Nursing	–	–	–	–	–	–	–	–	-0.149	-0.331
									(.292)	
— × *Anglo-Saxon*	–	–	–	–	–	–	–	–	-0.076	-0.081
									(.740)	
College	YES		YES		YES		YES		YES	
Certification	YES		YES		YES		YES		YES	
Experience	YES		YES		YES		YES		YES	
% Afro-American	YES		YES		YES		YES		YES	
Eq. opp. Employer	YES		YES		YES		YES		YES	
Log-likelihood	-468.22		-468.20		-467.37		-467.33		-466.99	

Note. Probit regressions on call-backs rate. Origins, location and field of the job offer are measured as dummy variables. Dummy variables are also added indicating: whether or not the vacancy advertisement indicates a bachelors degree, certification or experience as a necessary prerequisite for the job, and whether the add states that the company is an equal opportunity employer. The variable *% Afro-American* measures the percent of African-Americans living in the geographic area (defined at the city or town level) in which the job is located. The number of observations is $N = 990$ in all specifications.

at a narrower level than the suburb/city proper distinction. The results described previously are robust to this further conditioning: no discriminatory behavior can be found in the city proper, and all discrimination we observe comes from the suburbs. Last, Model (*5*) accounts for differences across fields in which jobs are offered. The p-values on estimated coefficients confirm that most discrimination against non-Anglo-Saxons comes from offers in accounting. The covariates included in the model seems to account for the differences observed above between the two other sectors: neither the fields by themselves nor the interaction with the ethnic origin of the name have any significant impact on call-backs.

5 Conclusion

This paper relies on a correspondence test in Chicago to measure the extent of ethnic homophily in the labor market, sending 990 resumes to different employers with three sets of names: Anglo-Saxon, African-American and Foreign names that are not clearly identified with any specific origin by the general population. The design of the experiment allows us to contrast discrimination faced by clearly identified minority groups with discrimination suffered by applicants for whom employers have no specific belief or taste – except for the fact that the name is clearly atypical.

Based on callbacks elicited by each set of names, we find that resumes with African-American and Foreign names receive one third fewer callbacks than resumes with Anglo-Saxon names. This suggests discriminatory behavior is part of a larger pattern of ethnic homophily, *i.e.* either general distrust against individuals not belonging to the dominant group or a kind of nepotism in favor of members of the dominant group. The rate at which resumes with foreign names receive callbacks is moreover very similar to the rate obtained by African-American names. This result is further substantiated by the geographic pattern of discrimination: the largest part of observed discrimination comes from the suburbs, where whites are a clear majority, while we do not find any significant difference in the rate of callbacks in Chicago proper, an extremely diverse city where non-Hispanic whites are a minority group.

In the policy sphere, programs to counter discriminatory treatment such as affirmative action programs in the United States have traditionally focused on aiding specific minority groups. This implicitly relies on the assumption that these groups are specifically targeted by discrimination. By contrast, the general ethnic homophily substantiated in this paper suggests that many members of other unrecognised minority groups may face discrimination, and that current programs may ignore this fact when only focusing on recognized groups. Our results also suggest that any migration flows of people coming from geographic areas that are unknown to most residents face discrimination in the labor market. This should turn attention to programs that rule out as much name identification as possible in the job matching process, such as mandatory anonymity of resumes.

References

Alesina, A., and E. L. Ferrara (2005): "Ethnic Diversity and Economic Performance," *Journal of Economic Literature*, 43(3), 762–800.

Arrow, K. (1973): "The Theory of Discrimination," in *Discrimination in Labor Markets*, ed. by O. Ashenfelter, and A. Rees. Princeton University Press, Princeton (NJ).

Ayres, I., F. Vars, and N. Zakariya (2005): "To Insure Prejudice: Racial Disparities in Taxicab Tipping," *Yale Law Journal*, 114, 1613–1674.

Becker, G. S. (1971): *The Economics of Discrimination*. University of Chicago Press, Chicago (IL).

Bendick, M. (2007): "Situation Testing for Employment Discrimination in the United States of America," *Horizons stratégiques*, 3(5), 17–39.

Bertrand, M., and S. Mullainathan (2004): "Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination," *American Economic Review*, 94(4), 991–1013.

Booth, A., A. Leigh, and E. Varganova (2010): "Does Racial Discrimination Vary Across Minority Groups? Evidence From Three Experiments," *IZA DP*, (4947).

Bursell, M. (2007): "What's in a name? A field experiment test for the existence of ethnic discrimination in the hiring process," *SULCIS WP*, 07(7).

Correll, J., B. Park, C. M. Judd, and B. Wittenbrink (2002): "The police officer's dilemma: Using ethnicity to disambiguate potentially threatening individuals.," *Journal of Personality and Social Psychology*, 83(6), 1314–1329.

Crowder, K. (2000): "The Racial Context of White Mobility: An Individual-Level Assessment of the White Flight Hypothesis,," *Social Science Research*, 29(2), 223–257.

Currarini, S., M. O. Jackson, and P. Pin (2009): "An Economic Model of Friendship: Homophily, Minorities, and Segregation," *Econometrica*, 77(4), 1003–1045.

Duguet, E., N. Léandri, Y. L'Horty, and P. Petit (2007): "Discriminations a l'embauche: un testing sur les jeunes des banlieues d'ile de France.," *Centre d'Analyse Stratégique WP*.

Giuliano, L., D. Levine, and J. Leonard (2009): "Manager Race and the Race of New Hires," *Journal of Labor Economics*, 27(4), 589–631.

Goldberg, M. S. (1982): "Discrimination, Nepotism, and Long-Run Wage Differentials," *Quarterly Journal of Economics*, 97(2), 307–319.

Habyarimana, J., M. Humphreys, D. N. Posner, and J. M. Weinstein (2009): *Coethnicity: Diversity and the Dilemmas of Collective Action*. Russell Sage Press, New York (NJ).

Jowell, R., and P. Prescott-Clarke (1970): "Racial Discrimination and White-collar Workers in Britain," *Race Class*, 11(4), 397–417.

Lang, K., and J.-Y. K. Lehmann (2010): "Racial Discrimination in the Labor Market: Theory and Empirics," *Mimeo*.

List, J. A. (2004): "The Nature and Extent of Discrimination in the Marketplace: Evidence from the Field," *Quarterly Journal of Economics*, 119(1), 49–89.

Miguel, E., and M. K. Gugerty (2005): "Ethnic diversity, social sanctions, and public goods in Kenya," *Journal of Public Economics*, 89(11-12), 2325–2368.

Oreopoulos, P. (2009): "Why Do Skilled Immigrants Struggle in the Labor Market? A Field Experiment with Six Thousand Resumes," *NBER WP*, (15036).

Phelps, E. S. (1972): "The Statistical Theory of Racism and Sexism," *American Economic Review*, 62(4), 659–661.

Putnam, R. D. (2007): "E Pluribus Unum: Diversity and Community in the Twenty-first Century," *Scandinavian Political Studies*, 30(2), 137–174.

Riach, P. A., and J. Rich (2002): "Field Experiments of Discrimination in the Market Place," *Economic Journal*, 112(483), F480–F518.

Riach, P. A., and J. Rich (2004): "Deceptive Field Experiments of Discrimination: Are they Ethical?," *Kyklos*, 57(3), 457–470.

Weichselbaumer, D. (2004): "Is It Sex or Personality? The Impact of Sex Stereotypes on Discrimination in Applicant Selection," *Eastern Economic Journal*, 30(2), 159–186.