WORKING PAPER

N° 2021-4

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DAVID GRAY, YANNICK L'HORTY,
SOULEYMANE MBAYE, PASCALE PETIT

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TEPP – Theory and Evaluation of Public Policies - FR CNRS 2042

The Unexplored Discriminations Towards Youth:

Equal Access to Goods and Services

DAVID GRAY, YANNICK L'HORTY, SOULEYMANE MBAYE, PASCALE PETIT*

March 2020

We carry out seven distinct and independent rounds of correspondence tests to detect discriminatory behaviour in domains that heretofore have not been subjected to much investigation in the literature: purchasing a used car, purchasing an auto insurance policy, applying for a car loan, purchasing complementary health insurance, enrolling in an adult training program, purchasing an existing small business, and renting vacation accommodations. We seek to discern evidence of discriminatory behaviour according to the criteria of age, gender, ethnic origin, and the locality of residence.

JEL: C93; J14; M53

Keywords: Discrimination, correspondence testing, age, ethnic origin, gender, neighborhood of residence

* David Gray, University of Ottawa, ERUDITE, TEPP-CNRS,
dmgray@uottawa.ca.
Yannick L'Horty, Gustave Eiffel University, ERUDITE, TEPP-CNRS,
yannick.lhorty@univ-eiffel.fr .
Souleymane Mbaye (corresponding author), Gustave Eiffel University, ERUDITE, TEPP-CNRS
souleymane.mbaye@univ-eiffel.fr .
Pascale Petit, Gustave Eiffel University, ERUDITE, TEPP-CNRS,
pascale.petit@univ-eiffel.fr .

As young folk acquire education and training, develop both soft and hard skills, and gain job experience to attain vocational or professional integration into the labour market, they can be confronted with a number of discriminatory obstacles, some of which are age-related, and others of which are based on demographic or spatial characteristics. Abstracting from their own individual human capital and educational backgrounds, one can imagine workers facing age discrimination in certain situations, although age is one of the motives that is officially prohibited by law. While most of the studies in the literature dealing with age-based discrimination involve alleged penalizing of older workers, one can imagine situations of discriminatory behaviour that disadvantage youth. In this vein, as they seek to gain a foothold in the labour market and launch their careers, many remain at its periphery and are thus potentially vulnerable to other discriminatory barriers tied to criteria such as gender, ethnic origin, and locality of residence. These potential disadvantages stem from the fact that young people frequently find themselves searching for work on the external job market with little or no professional experience that could signal their would-be productivity levels to recruiters.

The topic of this study is discriminatory behaviour towards youth as well as between groups of youths on the part of a selected set of service providers and vendors. We first investigate the role of age in the context of access to a job-training program. We subsequently hold the age variable constant in order to investigate whether groups of young folk can be subjected to discriminatory behaviour according to the criteria of ethnic origin, gender, and locality of residence. Our empirical approach utilizes the technique of correspondence testing based on randomized control trials, which in the economics literature have been applied extensively to labour and housing markets. In the French literature, such experiments have uncovered evidence of employment discrimination based on a variety of criteria. In the rental housing market, for example, French studies have focused on discrimination based on ethnic

origin as indicated by the names of the applicants (Bonnet *et al.* (2016), Acolin *et al.* (2016), Bunel *et al.* (2017a).

In this paper we depart from this literature by searching for empirical evidence of discrimination in seven product or service markets that have rarely been investigated – markets which nonetheless are germane for the economic and social integration of youthful workers. We have selected these markets because they are often viewed as complements to employment opportunities and the concomitant middle-class standard of living. They involve access to or purchasing the following seven items or services: a means of individual transportation, auto insurance, complementary health insurance, consumer loans, continuing training for adults, entrepreneurial opportunities, and leisure activities. The corresponding specific applications consist of the following markets: used cars, auto-insurance, auto loans, complementary health-insurance, vocational training, existing small enterprises, and vacation accommodations. The same data collection protocol and estimating techniques are applied to all seven cases. While the empirical results are drawn from seven separate studies that are each focussed on one of those cases, in this piece we provide an overarching synthesis and comparative summary of the larger project.

The first potential criterion of discrimination that we examine is age by comparing the outcomes of a 22-year-old individual to a middle-aged person who is 20 years older while holding all other factors fixed. We then move beyond the question of age in search of discriminatory outcomes *within* our set of profiles of 22-year-old individuals. In order to investigate potential discrimination against women, residents of disadvantaged neighborhoods, and individuals of African ethnicity, we vary those three attributes in isolation of each other.

For each of the seven trials, we send responses involving fake, stylised profiles to actual, posted, classified 'want ads'. The measured outcome is a non-negative response to the application or query that we submitted. For each of the evaluations, the tabulated outcomes are

compared to those of the base profile consisting of a young white male with a French-sounding name who does not reside in a disadvantaged neighborbood. The design of our experiment also allows us to analyse interacted discriminatory effects involving the impact of gender crossed with African origin.

The results indicate that none of these seven markets of application receive a clean bill of health as far as signs of potential discrimination are concerned. In most cases, however, the estimated magnitudes of the impacts were not large. Furthermore, the patterns of discrimination according to the attribute of the would-be buyer were not uniform across the seven markets. From the lens of discriminatory behaviour, each of the markets seems to exhibit intrinsic features. For example, an individual residing in a disadvantaged neighborhood might be disfavored in buying a used car, but not in purchasing complementary health insurance. According to our findings, which are admittedly based only on these seven markets, discrimination based on race/ethnicity and/or based on locality of residence might not be as systematic and mutually reinforcing as they are frequently perceived to be in other domains, most notably the labour market and the housing market.

We aim to avoid presenting our analysis in an excessively normative tone. We do not suggest that any sign of discrimination that we discern is necessarily nefarious in nature; some of them are undoubtedly due to statistical discrimination. Our goal in this paper is to uncover and quantify differentiated outcomes.

I. EXPERIMENTAL DESIGN

The field-experimental methodology that we employ involves the technique of correspondence testing, which is most often applied to recruitment operations. Researchers respond to actual job openings that have been posted by sending fictitious applications whose human capital attributes are presented as identical across groups. Every effort is made to eliminate differences in average characteristics across groups, with the obvious exception of

the criterion on which the potential discrimination is based. The outcome variable is the event of a callback, thus obviating the possibility that individual job applicants can influence the outcome of the experiment at stages subsequent to the initial point of contact. The relative frequencies for the binary callback variable are typically compiled for all the profiles, and then compared to the value for the reference profile (after adjustment for statistical adjustment), from which differences are interpreted as evidence of discriminatory or preferential selection behavior.

While it has been applied by researchers in other social science disciplines for decades, economists did not adopt it until later. An influential survey paper by Riach and Rich (2002) encouraged economic researchers to utilize it in their studies regarding discrimination.[1] The advantages of this empirical approach is that biases stemming from selection and unobserved heterogeneity are reduced. A disadvantage is that the results might not have a high degree of external validity beyond the specific and localized samples, which might not be representative of the underlying populations. It can also be challenging to obtain representative samples of the potential vendors.

As is common in the literature, we design profiles of fictitious applicants in our seven markets of application,[2] but the correspondence does not involve résumés or CVs. Instead, we respond to selected posted offers by sending out queries via E-mail from each of the six applicants or inquirers, which we describe in detail below. They are brief statements that are deliberately drafted in fairly colloquial style, but they are worded differently in efforts to avoid detection. These responses contain information regarding all of the four attributes (race, gender, neighborhood of residence, and age) whose effects we attempt to discern, but usually only one is varied at a time. The other characteristics of the requestors are rendered similar by design. Although their labour market situation is not made explicit in our responses, it might be inferred that their current situation in the labour market is precarious, perhaps alternating between short-

term work and spells of unemployment. These profiles are presented in Chart 1. The estimating strategy is to compare the call-back rates of the various requesters of information with the rate for the reference individual.

The data were collected during the one-year period from January 2015 to February 2016. Over the seven experiments, a total of 2,527 request for information were carried out in response to 2,527 posted offers, which in turn involved sending a total of 15, 162 (2,527 * 6) of them.

One trait that all of these six individuals share is their common interest in a career in the business of retailing. The 42-year-old worker is launching a new career in mid-life, while the five 22-year-old workers do not have prior stable work histories. Now we turn to a more in-depth analysis of how they acquire the requisite human capital and those aforementioned facilitators of economic and social advancement.

II. RESULTS

A. Access to vocational training

The individuals are interested in enrolling in adult training and sent out requests for information to a set of 154 providers, both in the public and private spheres, all of which had websites with a 'contact us' function. Note that this trial does not involve applying for admission, but it constitutes a useful first step in ultimately gaining access to the training program. Access to formal vocational and professional training, whether associated with a currently-held job or not, is thought to be very in-egalitarian in France; on average women and unskilled workers are viewed as disadvantaged.

In May of 2014, the population of service providers numbered about 48,000. From this list we selected 1,637 organisations who appeared to offer programs in the fields of retailing and sales in the Greater Paris area. Our sample is comprised of all 154 firms that had a 'contact us' link on their internet site. From November of 2015 to February of 2016, we sent to each of

them six similar messages within an interval of several days, all of which indicated an interest in the programming featured in the website, and solicited further information regarding the practicalities. This makes for a total of 924 messages that were emitted. The sequence of sending the 6 messages was randomized and varied across the training providers. The providers are selected from all over the Greater Paris area, but all of the would-be clients list an address that is within the same "department" (i.e. suburban county). We treat as negative responses those cases in which there is no response or when the person cannot enroll (perhaps because the sessions are full). In other cases, we consider the response to be non-negative.

The detailed results from this particular evaluation appear in du Parquet *et al.* (2017). A little more than half of the organisations that we tested emitted at least one non-negative response.[3] The 42-year-old individual is contacted the most frequently, and he is the one who has the highest response rate of almost 36 %. Among the service providers who emitted at least one response, he received one from over two-thirds of them. The distribution of non-negative responses obtained by each fictitious individual is conditioned on the total number of non-negative responses sent by each of the 154 firms is displayed in Table 7 of du Parquet *et al.* (2017)

Our main result is that there is discrimination in favour of the older worker, implying that the younger individuals have less access to the training program. While the reference candidate (i.e. the young male of French origin residing in a neutral neighborhood) is estimated to have a 27.9 % chance of receiving a positive response to his request for information, this proportion is 35.7 % for the 42-year-old candidate. The young woman of African ethnicity has a non-negative response rate of only 22.7 %.

Given the heterogeneity of both the service providers and of the programming, these estimated success rates can be sensitive to compositional effects. Certain characteristics of

either one could have differentiated effects on the chances of success of the requestors. To investigate this possibility, we generate estimates for sub-samples that are defined according to several of these characteristics, such as the length of the program (2 days or shorter, longer than two days, or unspecified), site of the program (training centre, some on-the-job training, or unspecified), in location (inside Paris or in suburbs). These detailed results, which are presented in Table 9 of Parquet *and al.* (2017), do reveal some non-uniform patterns, although few of them are estimated precisely due to small sample sizes. The chances of receiving a non-negative response tend to be higher when the duration is longer than two days, in which case these estimates are statistically comparable across the six fictitious individuals. The primary result that we discerned with respect to the older man is driven mostly by organisations within the city of Paris and by programs of very short duration.

B. Purchasing a Business

In the face of high youth unemployment, groups of workers who are alleged to encounter discrimination from employers might consider the self-employment option. According to the French Ministry of National Education and Youth, in 2012, 37 % of youth under 30 years of age declared that they envisaged either creating their own business or acquiring an existing one at some point in the future; 44% declared that they wanted to do so within five years. Purchasing an existing business might appear to be a less risky option than creating one's own enterprise from scratch. We now examine the extent to which groups of workers who are alleged to face discrimination in the labour market might also face obstacles in the market for existing businesses.

A similar study was carried out in Sweden in 2008 (Ahmed *et al.*, 2009). Two fictitious individuals, one having a Swedish-sounding name, the other having a Maghrebin-sounding name, sent out brief messages asking for further information to the same 546 business owners

who has posted advertisements. While 76 % of the former group received a non-negative response, only 67 % of the latter group did.

For this particular round of testing, we selected 341 postings of small businesses for sale that were posted on the internet between February and October of 2015.[4] This sample is quite heterogeneous, varying according to the particular sector of the business (restaurants, bars, beauty salons, grocery, clothing, etc.), location in the Greater Paris area, their sale price (under 50,000 to more than 100,000 euros), the urgency of sale, and the motive for the sale.[5] A total of 2,046 messages was sent out (341 * 6) during the week that the ad was posted. The order in which they were sent was randomized and varied from one ad to another. An outcome is coded as negative if either there is either no response or if the response indicates that the proposed transaction cannot occur. In all other cases, the response is treated as non-negative.

Out of the 341 posted offers that were subjected to testing, 113 (about one-third) of them elicited at least one response.[6] This low proportion is probably due to the high number of responses that most vendors received. Faced with a multitude of responses, the vendor cannot respond positively to all of them, and is likely to select them in non-random fashion.

As expected, the proportions of receiving a non-negative response vary according to the candidates. The relative frequencies are listed in the first column of Table 2. The young man residing in the disadvantaged neighborhood has the highest value of 21.7 %, while his counterpart of African ethnicity living in the neutral neighborhood has the lowest value of 4.7 %. The estimated discrepancies in the non-response rates between the requesters are listed in the second column of Table 2. Perhaps surprisingly, this set of statistical tests suggest a positive discrimination (to the tune of 11 percentage points) in favour of the young French man residing in the disadvantaged neighborhood. On the other hand, the young man of African origin,

despite living in a neutral neighborhood, has a response rate that is almost 6 percentage points below that of the young man of French origins.

We now turn to the question of whether these two findings reflect primarily compositional effects. In order to shed some light on the preferences of the vendors of given characteristics with respect to the individual requestors, we estimate discrete choice models of him/her receiving a non-negative response as a function of attributes of the business that is for sale (full results are presented in Mbaye (2017)). Note that this analysis does not involve discrimination *per se* because it focuses on the relationships between traits of the vendors and one requester independent of the responses sent to others. In particular, we focus on the finding that was unexpected, namely apparent favouritism towards the young man of French origin who resides in a disadvantaged neighborhood. Closer examination of this result suggests that it is linked to the sector of the enterprise. All other factors held constant, his chances are higher when it is not a restaurant or a grocery store. These particular ads share some common features, such as the vendor being a woman, the owner contemplating retirement, and having a regular clientele. The more in-depth analysis suggests that one contributing factor might be that the businesses that respond (non-negatively) to this group tend to be of relatively "low quality", as indicated by the asking price and the payments for renting the premises.

The differences in the non-negative response rates are also estimated for three sub-samples separated by sector: beauty/clothing/decorations, restaurants, and 'other'. Across all three sectors, the young man of French ethnicity residing in a disadvantaged neighborhood has a higher estimated probability of receiving a non-negative response, but the magnitude is higher in the non-food related ones. In contrast, the discrimination against the young man of African origin is statistically significant in the case of food-related establishments and the 'other' category of industries.

C. Purchasing a Used Car

We investigate possible discrimination related to the acquisition of mobility by applying our empirical approach to three markets that complement and interact with each other in determining the worker's degree of effective mobility. In addition to the market for used cars, which we treat in this section, below we treat the markets for car loans and car insurance, in which the would-be car buyer could conceivably encounter further obstacles.

Our evaluation of the used car market is in the spirit of the seminal study by Ayres and Siegelman (1995), who carried out an experiment searching for discrimination by sex and race by new car dealers in Chicago. The results revealed significant discriminatory behaviour regarding the outcome of negotiated price, such as white males being offered lower prices than white females or blacks for the same vehicle, which those authors attribute to statistical discrimination.

While we adopt their overall approach, our study differs in terms of technique and the exact market in question. Their testing technique consisted of an audit study involving actual potential buyers who visited dealers in pairs, whereas ours (as we explain below) involves fictitious would-be buyers who request information. We study the used car market, which is characterized by different supply conditions; there are two types of sellers: professional dealers and individual vendors. Furthermore, the development of the internet over the past quarter century has altered the modes of contact and communication. Would-be buyers can contact vendors without introducing any biases related to their personality, voice, or physical appearance at the initial stages of would-be transactions.

For this particular evaluative study, the fictitious would-be buyers respond to offers to sell used cars that are posted by both dealerships and individual vendors. We sent out the six messages in quasi-simultaneous fashion (i.e. within a few hours) to 489 ads for used cars in the

Greater Paris Area. The order of these six messages was randomized across the 489 ads for a total of 2,934 messages sent. The 489 offers appeared on the internet (the principal sites being Le bon Coin, La Centrale, and Vivastreet) between January and May 2015. The types of cars that are for sale are quite varied, differing by size (compact, sedan, single occupant, 4 by 4, convertible), brand, number of cylinders, number of doors, and price (from several hundred to more than 10,000 euros). While these vendors are spread out all over the Greater Paris area, the six would-be fictitious buyers always indicate an address within the same county. Throughout this paper, a response is treated as negative when the vendor either does not respond or indicates that the proposed transaction cannot take place, i.e. the car has been sold. The outcome that we tabulate is the non-negative response.

Out of the 489 ads that were posted and to which we responded, we elicited at least one non-negative response for only 106 of them (about 25 %). Along with other details of the results, the distribution of the number of responses (from 0 to 6) are contained in Mbaye *et al.* (2017). We suspect that this low proportion is due to the vendors likely receiving a multitude of inquiries following the posting of their ad. The vendor would probably have no way of processing all of these requests, and thus it is likely that he/she would adopt a non-random selection rule.

The relative frequencies for the six fictitious candidates are listed in the first column of Table 3. They range from 10.6 % for the candidate of reference (young French male residing in a neutral neighborhood) to 7.8 % for his counterpart in the disadvantaged neighborhood. The response rates are 8.4 % and 8.6 % for the young French woman and the young man of African origin (both residing in neutral neighborhoods), respectively. The gaps corresponding to those three disfavoured would-be buyers, which are listed in the second column of Table 3, are statistically significant. While this evaluation does reveal some discriminatory patterns, the estimated magnitudes are low relative to those discerned in our other analyses.

In order to investigate in more depth, we now incorporate characteristics of the advertisement itself as well as attributes of the vendor into our analysis. Adapting the empirical approach that was used in the preceding section to this application, we estimate probit models of the probability that a potential buyer will obtain a non-negative response from any posted offer independent of the other five inquirers.[7] These estimates can shed some light on the cases of apparent discrimination. It seems that the type of vehicle and the attributes of the vendor are more important than the price variable in affecting the probability of a non-negative response. The young woman of French ethnicity receives a higher response rate when the vendor is a woman and if it is a relatively small vehicle, *ceteris paribus*. Her counterpart of African origin receives lower responses rates when she contacts used-car lots in regards to larger cars, but fares better in the case of inexpensive vehicles. Although appearing to be disfavored overall, the young man of French ethnicity residing in a disadvantaged neighborhood has higher chances when inquiring about a bigger vehicle with a relatively high price relative to other types of vehicles. Vendors with non-French names tend to respond relatively less frequently to his queries.

In order to examine compositional effects, the non-negative response rates were estimated for sub-samples broken down according to the type of vehicle and the type of vendor (used-car lot or individual). Globally the individual vendors tend to favor the young man of French origin who resides in a neutral neighborhood, while the opposite is true for his female and male (African origin) counterparts. To a lesser extent, they tend to disfavor the young man of French origin residing in a disadvantaged neighborhood. That pattern varies according to the size of vehicle, however. In regards to the professional used-car vendors, we do not discern discriminatory patterns, as the non-negative response rates are statistically comparable across the would-be buyers. The young woman of African ethnicity appears to be favored relative to the reference case when trying to buy a small or mid-sized car at a dealership, but this estimate

is offset by the value for the case of big cars. In summary, discriminatory behaviour with respect to the neighborhood or the ethnic origin is associated with small or medium-sized vehicles, while such behaviour with regards to gender is concentrated among ads for larger vehicles.

D. Obtaining financing for the newly purchased used car

In order to finance this recently acquired auto, the individual solicits a car loan at consumer finance companies. It is well known that given the informational asymmetries regarding the reliability of the borrower, one might expect statistical discrimination as the lenders rely on signals, as discussed in the seminal piece by Stiglitz and Weiss (1981). More specifically, the lenders utilize schemes involving *credit scoring* to assess the risk of the borrower defaulting, which are based on numerous parameters. These scores and the underlying procedures generating them are supposed to respect the non-discrimination principle, as laid out in the French constitution.

The evaluation presented in this section investigates the potential for discriminatory behaviour in seeking a loan for a used car. As of January 1, 2012, the Bank of France listed 589 establishments that were authorized to extend consumer credit.[8] In June of 2016, we conducted testing of 20 financial establishments whose websites had a link with inputting functions (with several fields) allowing us to submit six requests for quotes. There were a total of 120 mailings (20 * 6). These requests corresponded to the distinctive profiles that are utilised throughout this paper; any attributes other than the one of interest had only minor variations. We treat a response as negative whenever the establishment either does not respond at all or indicates explicitly that it cannot grant a loan to the individual. In all other cases, the response is treated as non-negative, which we interpret as an agreement to lend in principle.

Just under two-thirds of the establishments (13 / 20) did send a non-negative response to at least one of the six fictitious candidates. Each of those 13 lenders sent a response to the 42-year old man of French origin, of which 5 of them responded to solely that individual. More details regarding the results, including a table showing the distribution of non-negative responses across the 20 financial firms, is contained in L'Horty *et al.* (2017). The relative frequencies of the non-negative responses received by each of the fictitious applicants is displayed in the first column of Table 4. They range from a low of 30 % in the case of the young woman of African ethnicity to a high of 65 % in the case of the 42-year old man of French ethnicity, both of whom reside in a neutral neighborhood. The estimated discrimination parameters, for which the reference case is the young woman of French ethnicity, are listed in the second column of Table 4. She received a non-negative response 40 % of the time. The only case for which this discrepancy is precisely estimated is the 42-year old man, for whom the discrepancy is a positive 25.1 percentage points. Perhaps due to the small sample size, there are no statistically significant discrepancies associated with gender, ethnicity, or the type of neighborhood, although the estimates for both the young man and young woman (both 22 years old) of African ethnicity are 10 percentage points lower (with prob. values of about 0.14).

It appears as though age-based discrimination that does not favour young folk is present in this market. However, we also examine the terms of credit that were offered in cases of non-negative response. It turns out that the 42-year man is quoted slightly higher interest rates.

E. Obtaining Insurance for the newly acquired, used car

The *Bank of France* maintains a list of 252 enterprises who provide "mixed insurance" (covering health-related and disability-related losses) and "non-life insurance" (covering auto-related and property losses).[9] In March of 2016, we tested 38 underwriters on this list for which we could apply for coverage and receive a quote on-line through their internet websites. The

six fictitious individuals filled out a set of fields with information allowing the firm to assess the risk and set the terms of a would-be insurance contract. These six requests are quite similar by design with the obvious exception of the attribute that is the focus of the particular test. Following the procedure that is employed in the other evaluations, either the absence of a response or an explicitly negative response are treated as negative responses, while other cases are treated as non-negative and labelled as 'agreements in principle.'

Given that 38 insurance companies were subjected to the testing, a total of 228 applications were sent out (38 * 6).[10] Overall the response rate was quite high, as 35 firms responded non-negatively to at least one of the six candidates with an agreement in principle, and 26 of them responded to all six individuals. The relative frequencies, which are listed in the first column of Table 5, do not vary very much. The young man of African origin received the most of these agreements (33), while the young man of French origin residing in the disadvantaged neighborhood received the least (30). The gaps in the response rates are listed in the second column of Table 5, and the only statistical difference that was discerned was between the young man of French origin living in the disadvantaged neighborhood and each of the other five individuals.[11] Even though only three firms account for that gap in the number of responses (33 – 30), that estimate is significant at the 7 % level of significance. We thus do not uncover much evidence of differential treatment as far as this outcome is concerned.

We now examine whether or not there are discrepancies across the six individuals in the terms of the offered insurance contracts. The annual premiums that are indicated range from 586 to 681 euros (not shown), and for this pricing outcome, there are statistically significant gaps that are listed in the fourth column of Table 5. In order to highlight the patterns of discrimination, the reference case for this particular set of estimates is the 42-year old man of French origin, who benefits from the lowest premiums (despite the fact that he has not been licensed for a longer period of time). The higher estimated premiums for the two 22-year old

women are not statistically significant, and thus they appear to be favored relative to the three young men. It is the 22-year old man residing in the disadvantaged neighborhood who receives the highest quote by far. Overall, our findings suggest that discriminatory practices do occur in the market for auto insurance, as access is costlier for those residing in disadvantaged neighborhoods and younger men – despite the fact that discrimination by gender is supposed to be prohibited. One the other hand, we do not uncover any statistically significant discrepancies by ethnicity.

F. Obtaining a supplemental health insurance policy

In this evaluation we test for differential access to complementary health insurance for individuals sending out very similar applications with the exception of one of the following attributes: either gender (among young folk), age (22 years versus 42 years), ethnicity, or the reputation of the neighborhood of residence. Discrimination based on sex is illegal. Even though differentiated treatment by age is legal, its magnitude is of interest. Furthermore, we note that there is no mention of discriminatory treatment based on ethnic origin nor on the area of residence in the documentation of their insurance.

Between April and May of 2016, we conducted testing involving 52 establishments whose websites had a functionality permitting us to apply for coverage through the internet. The six fictitious individuals filled out a number of fields with the information that is required to process the terms of a contract, including a quote. Following the procedure that is employed in the other evaluations, either the absence of a response or an explicitly negative response is treated as a negative response, while other cases are treated as non-negative and labelled as 'agreements in principle.'

Fifty-two establishments were subjected to testing, and thus a total of 312 messages were sent.[12] Unlike all of the other evaluations that are presented in this paper, every single

establishment responded non-negatively to at least one individual, and 41 of them issued a reply to all six of them. Each of the six applicants received between 45 and 49 'agreements in principle', as shown in L'Horty *et al.* (2017). The relative frequencies of the non-response rates are presented in the first column of Table 6. Note that they exceed 85 % for all applicants, and that the variance appears to be quite low. The comparisons between these non-negative response rates adjusted for statistical variation are listed in the second column of Table 6. As might be expected from eyeballing the relative frequencies, there is only one discrepancy that is statistically significant. The young woman of African origin appears to have a lower degree of access than any of the other five applicants.

Based on the preceding analysis involving the issuance of agreements in principle, it appears as though one must analyse other outcomes in search of differentiated treatment. The mean levels of the quoted premiums for two levels of coverage – lower and higher – are presented for all six individuals in Table 7. The differences are remarkable, with annual premiums ranging from 291 to 467 euros for the lower level of coverage and 676 to 1064 euros for the higher level. In the second column of Table 7, we list the estimated discrepancies in these values (adjusted for statistical variation) between the applicants. As one would expect from the raw figures mentioned above, we discern a strong discriminatory pattern for the level of premiums, which happens to be linked to age. Irrespective of the level of coverage, the 42 year-old faces premiums that are approximately 50 % higher than the ones offered to the five younger applicants.

The differences in quoted premiums between the five 22 year-old individuals are also statistically significant, but the magnitudes are very low – less than 10 euros per year. Within this group, the variation in them is quite low. We do not, however, totally rule out the possibility that the algorithm takes account of very small differences in age in determining premiums. According to the birth dates that were inputted, the young man of French origin (living in a

neutral neighborhood) is several months older than the other four 22-year old applicants; he is required to pay slightly higher premiums.

G. Making Hotel Reservations for a Vacation

Between April and June of 2015, the six fictitious individuals solicited information regarding lodging from a total of 1,433 establishments that had posted ads. All messages requested a reservation for a one week stay during the high summer season. Our sample consists of lodging establishments in three regions, among the most popular tourist destination in France (PACA, Pays de la Loire and Bretagne). The accommodations themselves are either campgrounds, bed and breakfasts, or hotels. They were selected from three tourist guides: *Petit Futé*, *Guide Michelin*, and the *Guide du Routard*. Over an interval of several days, each establishment received messages from these six individuals requesting a reservation for the same period. The order in which they were emitted was randomized across the establishments. They all indicated that they resided in the city of Paris.

We treat a response as negative if either the establishment does not respond to the request, or if the request is turned down, i.e. it is closed or full over that period. All other cases are treated as non-negative responses. We sent out a total of 8,598 messages to 1,433 establishments, of which 1,342 sent a response of any kind to at least one of the six fictitious candidates. In 1,254 cases we received a non-negative response to at least one of them.

More than 85 % of the establishments sent a positive response to at least one of the six requestors; among this group, only one in four responded in non-negative fashion to all six of them. The latter proportion seems to be on the low side, which we attribute to the high number of messages that the lodging establishments received upon the release of their advertisement. Faced with a flood of requests, if the establishment does not have the capacity to respond positively to all of them, it seems unlikely that it would make its selection in random fashion.

Indeed, the relative frequencies for each fictitious requestor, which are listed in the first column of Table 8, vary from 46.3 % for the young man residing in the disadvantaged neighborhood to 63 % for the 42-year old man. As shown in Bunel *et al.* (2017b), in those instances in which an establishment chooses to address a non-negative response to only one individual, it chooses the 42-year old one in 34 % of such cases, while the youth residing in the disadvantaged neighborhood evokes such a response in only 6 % of such cases.

The comparisons between the non-negative response rates appear in the second column of Table 8. All of these discrepancies are statistically significantly different from the reference case of the young man of French origin residing in a neutral neighborhood, indicating discriminatory behaviour according linked to age, ethnic origin, the reputation of the neighborhood, as well as gender. We discern a general pattern that does not appear to favour the young folk, as they all exhibit negative discrepancies relative to the 40ish man. Among the five youthful individuals, it is the man residing in the disadvantaged neighborhood that has the lowest chances of receiving a non-negative response, while the man and the woman of African origin fare only slightly better on average.

This analysis is also conducted on various sub-samples. We obtain separate estimates for the three classes of accommodation: hotels, bed and breakfasts, and camp grounds. The non-negative response rates tend to be a bit lower for the bed and breakfast establishments. The discriminatory patterns differ across the three classes. We do not find evidence of age discrimination amongst the hotels; the favouritism towards the older man is discerned amongst the bed and breakfast places. Amongst the younger individuals, we discern discrimination against the man residing in the disadvantaged neighborhood across all three classes of lodging, but the effect is weaker in the case of camp grounds. Hotels do not appear to discriminate against individuals of African origin, but that is not the case for the campgrounds and the bed and breakfasts.

The next robustness analysis is based on a division of the sample according to the three geographical regions (PACA, Pays de la Loire, Bretagne). The pattern of positive discrimination in favour of the 42-year-old man is found only in the region of Pays de la Loire. Among the five younger requesters, it is only in the regions of PACA and the Pays de la Loire for which the individuals of African origin are disfavoured. Discrimination associated with the disadvantaged neighborhood was discerned in all three regions, but more markedly in PACA and less so in Bretagne.

Finally we examine the role of the price category of the lodging that is being tested. According to Neumark (1996), the price ranges provide an indication of the "standing" of the hotel, etc. We compared the non-negative response rates of the six candidates between the establishments in the top and bottom quartiles of our sample ranked by the fee levels. As far as the campgrounds are concerned, the least expensive 25 % do not appear to practice any discrimination according to the attributes that we test, while we discern the opposite pattern within the most expensive quartile. Hotels appear to discriminate against the young man from the disadvantaged neighborhood irrespective of the level of fees, and the more expensive ones seem to disfavour both individuals of African origin. Irrespective of the price, the bed and breakfasts also discriminate against those two profiles, but only those bed and breakfasts charging lower fees discriminate according to the reputation of the neighborhood.

III. DISCUSSION

The patterns of discrimination that we have estimated are summarized in Chart 2. Each of the six columns corresponds to one of our fictitious individuals (A,B,C,D,E,F), whose attributes are presented in chart 1. All seven markets which we tested for discriminatory behaviour are listed in the rows. If the individual appears to receive favourable (unfavourable)

treatment relative to the reference case (usually the 22-year old man of French origin residing in a neutral neighborhood), the label 'positive' ('negative') is entered in the corresponding cell.

Checking horizontally across the columns, we uncovered evidence of some form of discrimination in all seven markets, although the criteria, the magnitudes, and the signs differ from one market to another. When applying for a car loan, there was evidence only of age discrimination for the case of the 42-year old man. When inquiring about vacation accommodations, there was evidence of all motives of discrimination, i.e. by age, sex, reputation of neighborhood, and ethnic origin. This finding suggests that studies in the discrimination literature that deal only with a single market, such as the labour market (which is by far the most frequent application in France), under-estimate the scope and extent of discriminatory phenomena that can work against the more vulnerable socio-demographic groups.

Checking vertically down the rows, relative to the reference case, each of the other five fictitious individuals – corresponding to four distinct motives of discriminatory behaviour - experiences at least one case of unfavourable treatment, but four of them also experience at least one case of favourable treatment. These patterns highlight the singularity of each motive of discrimination, the repercussions of which are not uniformly manifested in the different markets. The effects of age, gender, reputation of neighborhood of residence, and ethnic origin differ. It was somewhat unexpected that the impacts for individuals with African-sounding names did not dovetail with those for the individual residing in a disadvantaged neighborhood. This young, presumably white man, who resides in a relatively poor neighborhood, pays relatively high car insurance premiums, but appears to be favoured when attempting to acquire his own business. In contrast, the young, presumably black man residing in a neutral neighborhood encounters the opposite pattern of responses. These findings are not consistent with the common view that seems to underlay the public policy debates regarding

discrimination – namely that these two criteria of discrimination overlap and reinforce each other. They are often conflated in the public psyche.

Overall, each motive of discrimination has its own intrinsic characteristics that operate through particular mechanisms at work in certain markets. Young folk tend to be confronted by a multiplicity of barriers to their social and economic integration due to their age, but also due to their gender, their ethnic origin, and the reputation of their neighborhood.

In addition to these general results, we mention some findings that are specific to either a certain motive for discrimination or to characteristics of the suppliers operating in a certain market. For example, in the market for used cars, the behaviour appears to depend on the type of vendor. This type of finding calls for focussed and detailed analyses that take account of the particularities of the transactions that take place in each market.

We focus mostly on differentiated access to services rather than price discrimination and the potentially joint effects between these two outcomes. That is a topic for future research. We also note that despite the richness and the variety of the results that we report in this study, there are limits to their external validity. As is the case for all analyses based on the testing methodology, they pertain only to a given market in a defined area at the time when the data were collected. Replications of these tests with enlarged samples may be warranted.

ACKNOWLEDGEMENTS

The authors gratefully thank the Ministry of Cities, Youth and Sports of the Central French government, which financed this study through the Fund for Experimentation for Youth. This fund is earmarked to promote the academic success of students as well as the social and professional advancement of youth under twenty-four years of age. Solely the authors of this study are responsible for the results presented and the views expressed within it.

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APPENDICES

Chart 1: Descriptions of Candidate Profiles

Profile of applicant/requester	Age	Gender	Sound of name	Reputation of the neighborhood of reference (in the Greater Paris Area)
A: « Kevin Petit » (reference profile)	22	male	French	Neutral
B: « Christophe Leroy »	42	male	French	Neutral
C: « Laura Durand »	22	female	French	Neutral
D: « Désiré Sambou »	22	male	African (non muslim)	Neutral
E « Florian Roux »	22	Male	French	Disadvantaged (situated in a neighborhood deemed « City Policy")
F « Grâce Goudiaby » (varies both gender and ethnicity)	22	Female	African (non muslim)	Neutral

Chart 2

Summary of discrimination patterns

Type of market	Candidate profiles					
	A (reference)	B	C	D	E	F
Used car		negative	Negative	Negative	Negative	
Access to car loan		Positive				
Terms of car loan		Negative				
Access to car insurance			Positive		Negative	Positive
Cost of car insurance		Positive			Negative	
Access to health Insurance						Negative
Cost of health insurance		Negative				
Access to training		Positive				Negative
Acquisition of enterprise				Negative	Positive	
Access to lodging		positive	Negative	negative	Positive	Negative

Table 1

Differences in the non-negative response rate emanating from the same vocational training organisations (estimated discrimination parameters) (reference profile: 22-year-old woman, African origin)

Profile (reference case: 22-year old woman of African origin)	Relative frequency of non-negative responses	Statistical discrepancy for non-negative response (% points)	Probability value
22-year old woman of African origin	22,7		
22-year old woman, French origin, neutral neighborhood	27.9	5.2	0.114
42-year old man, French origin, neutral neighborhood	35.7	**12.9*** **	0.001
22-year old man, French origin, neutral neighborhood	27.9	5.2	0.146
22-year old woman, French origin, disadvantaged neighborhood	25.9	2.7	0.432
22-year old man, African origin, neutral neighborhood	26.0	3.3	0.391

*Notes: The t-statistics and the confidence intervals were calculated using the bootstrap method with 10,000 draws; *** significant at the 1% level, ** significant at the 5 % level, *significant at the 10 % level*

Table 2

Differences in the non-negative response rate emanating from the same business for sale offers (estimated discrimination parameters) (reference profile: 22-year-old man, French origin)

Profile (reference case: 22-year old man of French origin)	Relative frequency of non-negative responses	Statistical discrepancy for non-negative response (% points)	Probability value
22-year old woman, French origin, neutral neighborhood	12.0	1.473	0.381
22-year old woman, African origin, neutral neighborhood	11.1	0.592	0,765
42-year old man, French origin, neutral neighborhood	9.7	-0,880	0,605
22-year old man, French origin, neutral neighborhood	10.6		
22-year old man, French origin, disadvantaged neighborhood	21.7	**11,137*** **	0.0
22-year old man, African origin, neutral neighborhood	4.7	**-5,860*** **	0.0

*Notes: The t-statistics and the confidence intervals were calculated using the bootstrap method with 10,000 draws; *** significant at the 1% level, ** significant at the 5 % level, *significant at the 10 % level*

Table 3

Differences in the non-negative response rate emanating from the same used car for sale offers (estimated discrimination parameters) (reference profile: 22-year-old man, French origin)

Profile (reference case: 22-year old man of French origin)	Relative frequency of non-negative responses	Statistical discrepancy for non-negative response (% points)	Probability value
22-year old woman, French origin, neutral neighborhood	8.4	**- 2.24***	0.089
22-year old woman, African origin, neutral neighborhood	9.6	-1.06	0.446
42-year old man, French origin, neutral neighborhood	8.6	-2.03	0,123
22-year old man, French origin, neutral neighborhood	10.6		
22-year old man, French origin, disadvantaged neighborhood	7.8	**-2.85****	0.044
22-year old man, African origin, neutral neighborhood	8.6	**-2.04***	0.097

*Notes: The t-statistics and the confidence intervals were calculated using the bootstrap method with 10,000 draws; *** significant at the 1% level, ** significant at the 5 % level, *significant at the 10 % level*

Table 4

Differences in the non-negative response rate relating to loan applications (reference profile: 22-year-old woman, French origin)

Profile (reference case: 22-year old woman of French origin)	Relative frequency of non-negative responses	Statistical discrepancy for non-negative response (% points)	Probability value
22-year old woman, French origin, neutral neighborhood	40.0		
22-year old woman, African origin, neutral neighborhood	30.0	- 10.0	0.138
42-year old man, French origin, neutral neighborhood	65.0	**25.1*****	0.009
22-year old man, French origin, neutral neighborhood	35.0	- 5.0	0.305
22-year old man, French origin, disadvantaged neighborhood	35.0	- 5.1	0.304
22-year old man, African origin, neutral neighborhood	30.0	- 10.1	0.138

*Notes: The t-statistics and the confidence intervals were calculated using the bootstrap method with 10,000 draws; *** significant at the 1% level, ** significant at the 5 % level, *significant at the 10 % level*

Table 5

Differences in the non-negative response rates and premium quotes relating to applications for auto insurance

Profile	Relative Frequency of response	Discrep-ancy in non-negative response	P-value	Discrep-ancy in quoted price (euros)	P-value
22-year old woman, French origin, neutral neighborhood	84.2	-2.63	0.31	14.36	0.56
22-year old woman, African origin, neutral neighborhood	81.6	-5.20	0.15	32.36	0.18
42-year old man, French origin, neutral neighborhood	81.6	-5.37	0.41	Reference case	
22-year old man, French origin, neutral neighborhood	81.6	-5.28	0.153	34.63*	0.10
22-year old man, French origin, disadvantaged neighborhood	78.9	**-7.89***	0.07	**95.22****	0.00
22-year old man, African origin, neutral neighborhood	86.8	Reference case		**43.77****	0.03

***** Note: The reference case for the first set of estimates is the 22-year old man of African origin, while it is the 42-year man of French origin for the second set. *The t-statistics and the confidence intervals were calculated using the bootstrap method with 10,000 draws; *** significant at the 1% level, ** significant at the 5 % level, *significant at the 10 % level*

Table 6

Differences in the non-negative response rate relating to complementary health insurance applications (reference profile: 22-year-old man, French origin)

Profile (reference case: 22-year old man of French origin)	Relative frequency of non-negative responses	Statistical discrepancy for non-negative response (% points)	Probability value
22-year old woman, French origin, neutral neighborhood	88.5	-3.8	0.421
22-year old woman, African origin, neutral neighborhood	86.5	**- 5.7****	0.072
42-year old man, French origin, neutral neighborhood	94.2	1.9	0.658
22-year old man, French origin, neutral neighborhood	92.3		
22-year old man, French origin, disadvantaged neighborhood	92.3	0.0	0.994
22-year old man, African origin, neutral neighborhood	92.3	0.0	0.998

*Notes: The t-statistics and the confidence intervals were calculated using the bootstrap method with 10,000 draws; *** significant at the 1% level, ** significant at the 5 % level, *significant at the 10 % level*

Table 7

Differences in the premiums quoted for complementary health insurance applications (reference profile: 42-year-old man, French origin)

Profile of applicant	Average quoted annual premium (euros)	Discrepancy (euros)	P-value
Lower coverage	466.9		
Reference case: 42-year old man of French origin			
22-year old woman, French origin	294.5	**-172.4*** **	0.0
22-year old woman, African origin	291.1	**-175.8*** **	0.0
22-year old man, French origin	295.6	**-171.2*** **	0.0
22-year old man, French origin, resident of disadvantaged neighborhood	291.2	**-175.7*** **	0.0
22-year old man, African origin	291.4	**-175.5*** **	0.0
Higher coverage	1063.8		
Reference case: 42-year old man of French origin			
22-year old woman, French origin	681.3	**-382.2*** **	0.0
22-year old woman, African origin	675.7	**-387.8*** **	0.0
22-year old man, French origin	685.1	**-378.5*** **	0.0
22-year old man, French origin, resident of disadvantaged neighborhood	676.5	**-387.3*** **	0.0
22-year old man, African origin	675.7	**-388.5*** **	0.0

*Notes: The t-statistics and the confidence intervals were calculated using the bootstrap method with 10,000 draws; *** significant at the 1% level, ** significant at the 5 % level, *significant at the 10 % level*

Table 8

Differences in the non-negative response rate relating to requests for travel accommodations (reference profile: 22-year-old man, French origin)

Profile (reference case: 22-year old man of French origin)	Relative frequency of non-negative responses (%)	Statistical discrepancy for non-negative response (% points)	Probability value
22-year old woman, French origin, neutral neighborhood	54.2	**-2.58***	0.09
22-year old woman, African origin, neutral neighborhood	47.8	**- 9.02*****	0.00
42-year old man, French origin, neutral neighborhood	63.0	**6.02*****	0.00
22-year old man, French origin, neutral neighborhood	56.8		
22-year old man, French origin, disadvantaged neighborhood	46.3	**- 10.47*****	0.00
22-year old man, African origin, neutral neighborhood	49.3	**-7.54*****	0.00

*Notes: The t-statistics and the confidence intervals were calculated using the bootstrap method with 10,000 draws; *** significant at the 1% level, ** significant at the 5 % level, *significant at the 10 % level*

[1] More recent pieces include the handbook chapter by Bertrand and Duflo (2017) and the *Journal of Economic Literature* article by Neumark (2018).

[2] As mentioned above: used cars, consumer credit, auto insurance, supplemental health insurance, adult training, purchases of small business, and vacation lodging

[3] 17.3 %, 25.9 %, 18.5 %, 14.8 %, 9.9 %, and 13.6 % emitted 1,2,3,4,5, or 6 non-negative responses, respectively.

[4] The principal websites that we utilized were « Le Bon Coin », « Papcommerce », « Paruvendu », « Placedescommerces », and « Vivastreet".

[5] According to the « Centre Régional d'Observation du Commerce de l'Industrie et des Services » (http://www.crocis.cci-paris-idf.fr/), in the Greater Paris are, more than one business in three has a head who is older than 54. There are thus potentially 266,300 enterprises having fewer than 50 workers that might face an ownership challenge in the medium term, the vast majority of which have fewer than 5 workers. This market is characterised by an imbalance between supply and demand; there is huge variation in size, volume, and the sector that renders exchanges more complex.

[6] The precise distribution of the number of non-negative responses (from 0 to 6) across all ads is presented in Mbaye (2017), which also contains other details regarding the results.

[7] The exogenous variables are all categorical. They are: used car lot versus individual vendor; compact or small sedan versus big sedan and other; price in euros (<1000,1000-2000,2000-5000,5000-10000, > 10000); gender of vendor, and sound of name of vendor (French-sounding, non-French sounding, indeterminate).

[8] http://acpr.banque-france.fr/fileadmin/user_upload/acp/publications/registre-officiel/20120101-ACP-liste-des-etablissements-de-credit.pdf

[9] http://acpr.banque-france.fr/fileadmin/user_upload/acp/Agrements_et_autorisations/Listes_assurances/201405-Liste-des-entreprises-assurance.pdf

[10] More details of the evaluation components involving insurance are contained in L'Horty et al. (2017)

[11] The reference case is the 22-year old man of African origin.

[12] Further details regarding the tabulations and empirical results are contained in L'Horty *et al.* (2017).

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