The GEMM study: A cross-national harmonized field experiment on labour market discrimination -Codebook

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1. General Information

The Growth, Equal Opportunities, Migration & Markets (GEMM) project is a large-scale project investigating causes and consequences of inequality on the labor market. To do so, a large-scale comparative field experiment on discrimination in hiring behavior was conducted in five countries: The United Kingdom, Spain, Germany, Norway and the Netherlands.

In each of these countries, cover letters and CVs were sent out in response to vacancies advertised on online platforms. A maximum of one application per vacancy was sent out. All feedback from the employer in response to the application was collected and coded. All in all, this data set contains more than 19,000 applications. The data collection (i.e. sending out applications) took place over the span of two years from the 30th of July 2016 until the 1st of June 2018.

The cover letters and CVs used in the experiment differed from each other on several characteristics: Most importantly, the fictitious applicants varied in terms of their country of origin and, depending on that, in religious affiliation and appearance. A total of 53 different origin countries were used in the experiment. Apart from the ethnicity, religion and phenotype treatments, applicants also had varying, randomly assigned levels of qualification for their jobs. An overview of the treatments used in the field experiment can be found in table 1. For more detailed information refer to the respective variables in the codebook.

The occupations selected for this experiment were cooks, electricians, payroll clerks, plumbers, receptionists, sales representatives, software developers, store assistants, hairdressers and carpenters. They were chosen because their field of duty is similar across countries and they require different levels of customer contact and educational requirements. Not all occupations were used in all five countries.

In the following document, variable names are denoted in bold and between square brackets.

[ID]
Number uniquely identifying each observation in the dataset.

Numeric variable.

[country]

Variable indicating in which of the five participating countries the application was sent out.

1   United Kingdom
2   Spain
3   Germany
4   Norway
5   The Netherlands

Table 1: Overview experimental treatments

Treatment	Description	Variable name
Country of origin	Applicant's country of origin varied. 53 different countries were used.	ethnicity
Gender	Applicants are either male or female.	gender
Grade	Half of the applicants had a grade considered good, while the other half had a passing, but not particularly good grade.	grade
Migration status	Applicants were either natives, 1st or 2nd generation immigrants.	migrationstatus
Performance	For half of the applicants a statement was included in their application indicating they are particularly productive and hardworking, while the other half did not get this treatment.	treat_perf
Warmth	For half of the applicants a statement was included in their application indicating they are particularly social and work well in teams, while the other half did not get this treatment.	treat_warmth
Religion	Applicants either had no religious affiliation or they were affiliated with a Christian, Muslim, Buddhist or Hindu organization. The religion treatment used varied and was dependent on the applicant's country of origin.	religion
Phenotype	In Spain, Germany and the Netherlands applications contained photos. The phenotype of the applicant in the photo varied and was dependent on the applicant's country of origin.	phenotype

2. Callback Variables

Every employer's response to the application is coded, but the researchers do not engage into further communication with the employer. Only in response to the response types invitation, pre-invitation, additional info wanted and incomplete application (see variable f#_type) did the researchers politely withdraw the application stating that the candidate is no longer interested.

There were up to eleven rounds of employer feedback per application, meaning the employer got back to the research team up to eleven times with some type of feedback. In the codebook, a "#" in the variable name indicates eleven alterations of that variable exist (e.g. f1_date to f11_date). For every feedback round, the following information was recorded:

[f#_date]

Variable indicating the date the employer's feedback was received. The date was recorded manually in the Netherlands and Germany and automatically by a computer in the United Kingdom and Norway. In Spain, feedback dates were recorded automatically if the feedback was received through the job search website and manually if it was received via the phone.

Stata date variable.

[f#_channel]

Variable indicating the communication channel through which the employer's feedback was received. The "Job Portal" category indicates that the feedback was received directly via the job search website, e.g. in the form of an automated message. This information is coded manually.

1   Email
2   Telephone
3   SMS
4   Whatsapp
5   Postal letter
6   Job Portal

[f#_type]

Variable indicating what type of feedback was received from the employer. This information is coded manually.

1   Confirmation of receipt
2   Missed call
3   Incomplete application
4   More information wanted
5   Pre-invitation
6   Invitation
7   Rejection
8   Detection
9   Other

The categories are defined as follows:

1. **Confirmation of receipt:** [f#_type] = 1 if we received a confirmation message from the employer/job search website that our application has been received.

   Example: "We have correctly received your application. We will contact you if we have questions."

   Note: In Spain all applicants receive an automatic confirmation of receipt after submitting their application. Since this does not reflect any interest in the candidate by the employers, confirmations of receipt are not coded as feedback in Spain.

2. **Missed call:** [f#_type] = 2 if the employer has tried to reach the candidate by phone but did not leave a message in the voicemail. The name of the employer/company has to be traceable using the telephone number of the missed call in order to be coded as missed called.
   Missed calls are defined as SMS notifications about missed calls to the cell number given on the application in Spain and as missed calls, voicemails and SMS notifications of missed calls in Germany, Norway and the Netherlands.

   Note: Missed calls are not recorded in the UK.

3. **Incomplete application:** [f#_type] = 3 if the employer asks the candidate to give additional information as part of the application process, not as a result of a filtering/selection process but as a standardized procedure. Presumably, this information is needed in order for the application to be processed in the first place. The request for additional information does not signal a particular interest in the candidate.

   Example: "As the first stage in the process we ask all candidates to complete the following test. This forms an important part of our recruitment process and we have a minimum score that you will need to achieve, in order to progress your application to the next stage."

4. **More information wanted:** [f#_type] = 4 if the employer asks for additional information about the candidate or asks to be called back. This variable indicates that the employer has most likely reviewed all applications and requests additional information about the candidate. Presumably not all candidates are contacted for additional information.

   Example: "We have been trying to get in touch with you regarding your application, but unfortunately have been unable to reach you. Can you please call us back at your earliest convenience?"

5. **Pre-invitation:** [f#_type] = 5 if the candidate has passed an early selection process but s/he is not (yet) formally invited for an interview/meeting. There is clear evidence that the candidate has passed a selection process.

   Example: "Your applications has been selected. Before we invite you for a personal interview we would like you to participate in this test/survey/phone screening etc."

   Note: In Spain, pre-invitation and invitation cannot be distinguished because the job portal only sends out a standardized message ("the company has included your candidacy among those that continue the hiring process") and the employers often do not personally contact the candidate

with information beyond that. We code all of these positive automatic responses as invitations and do not use the category pre-invitation in Spain.

6. **Invitation:** [f#_type] = 6 if the employer wants to interview the candidate over the phone or on site. It has to be clear that the candidate is invited to a formal interview, not simply to a quick chat to verify the information provided on the resume.

   Example: "Your CV is very impressive and we think you would be a great addition to our team. We would like to invite you for a formal interview and trial shift."

   Note: In Spain, pre-invitation and invitation cannot be distinguished because the job portal only sends out a standardized message ("the company has included your candidacy among those that continue the hiring process") and the employers often do not personally contact the candidate with information beyond that. We code all of these positive automatic responses as invitations and do not use the category pre-invitation in Spain.

7. **Rejection:** [f#_type] = 7 if the employer explicitly contacts the candidate to let him/her know that the s/he has not been selected or is out of the selection process.

8. **Detection:** [f#_type] = 8 if the experiment has been detected by a firm, a recruiter, or by the job search website.

9. **Other:** [f#_type] = 9 if the response does not fit any other category.

   Examples:
   - The candidate has been redirected to another job (e.g. because of geographical proximity)
   - The candidate was contacted unsolicited by the employer for another opening
   - The position was already filled when we applied

3. Variables concerning the vacancy

[occupation]

Variable indicating the occupation of the job vacancy. For a list of search terms that were used to identify vacancies in each country, refer to Appendix A1.

Note: Hairdressers, plumbers, electricians and carpenters have been added to the study in 2017. Also, beginning in July 2017, two new occupational categories ("Office clerk – administrative" & "office clerk – accountant") were added in Spain and the UK. These categories are combined in the data under the label "Payroll Clerk" to match the other countries.

Code	Label	ISCO-08 Code(s)	ISCO name	Sampling
1	Cook	512	Cooks	
2	Electrician	7412	Electrical Mechanics and Fitters	Not in Germany and Spain
3	Payroll Clerk	3341 3343 3344 411 412 4311 4313	Office Supervisor Administrative and Executive Secretaries Medical Secretaries* General Office Clerks Secretaries (General) Accounting and Bookkeeping Clerks Payroll Clerks	
4	Plumber	7126	Plumbers and Pipe Fitters	Not in Germany and Spain
5	Receptionist	4224 4226	Hotel Receptionists Receptionists (General)	
6	Sales Representative	2431 2433 2434 3322	Marketing professionals Technical and Medical Sales Professionals (excluding ICT) Information and Communications Technology Sales Professionals Commercial Sales Representatives	
7	Software Developer	2512 2513 2514	Software Developers Web Developers Applications Programmers	
8	Store Assistant	5223 5221 5222 5230	Shop Sales Assistants Shopkeepers Shop Supervisors** Cashiers and Ticket Clerks	
9	Hairdresser	5141	Hairdressers	Not in the UK
10	Carpenter	7115	Carpenters and Joiners	Not in Germany, Spain and the UK

* only if no specific experience in a nursing/medical environment is required

** only if no management experience is required

[app_retrieved]

Variable indicating the date the job vacancy was retrieved from the online portal by the researchers. This information was recorded automatically by a crawler.

Stata date variable

Note: This information is unavailable for Spain.

[app_published]

Variable indicating the date the job vacancy was first published on the job search platform. This information was recorded automatically by a crawler.

Stata date variable

[app_sent]

Variable indicating the date the application was sent out. This information was recorded automatically.

Stata date variable

Note: In the Netherlands, this information was sometimes not recorded. For that reason, in case the [app_sent] variable was missing in the Netherlands, it was replaced with the date the application was retrieved (see [app_retrieved]).

[app_sent_channel]

Variable indicating the channel via which the application was sent out.

  1   Online application (e.g. via the website of the job portal)
  2   Postal application
  3   Email application

[wp_nuts2]

This variable indicates the name of the second-level statistical region that the vacancy is located in according to the 2013 Nomenclature of Territorial Units for Statistics (NUTS). This variable is generated from zip code data.

It contains the country code followed by a number, e.g. DE11 refers to the NUTS 2 region "Stuttgart" in Germany. A full list of the 2013 NUTS codes and the names of the regions they refer to for each country can be found at http://ec.europa.eu/eurostat/tercet/flatfiles.do

Note: This variable is unavailable for the United Kingdom.

[wp_nuts3]

This variable indicates the name of the third-level statistical region that the vacancy is located in according to the 2013 Nomenclature of Territorial Units for Statistics (NUTS). This variable is generated from zip code data.

It contains the country code followed by a number, e.g. DE111 refers to the NUTS 3 region "Stuttgart, Stadtkreis" in Germany. A full list of the 2013 NUTS codes and the names of the regions they refer to for each country can be found at http://ec.europa.eu/eurostat/tercet/flatfiles.do

Note: This variable is unavailable for the United Kingdom.

[comp_size]

Variable indicating how many employees the company with the job vacancy has. Data on company size is retrieved automatically by a crawler in Spain, Germany and the Netherlands and manually in Norway. It is then recoded into categories.

1   Less than 6 employees
2   6-50 employees
3   51-500 employees
4   501-5000 employees
5   More than 5000 employees

Note: The variable is unavailable for the United Kingdom.

[equal]

Dummy variable indicating whether equal employment opportunities are explicitly mentioned in the job advertisement. This variable is 1 if a variation of "We encourage applicants from all backgrounds to apply" is included in the advertisement and 0 otherwise. This variable is coded manually.

0   No
1   Yes

Note: The variable is not used in Germany and Spain.

[anonym]

Dummy variable indicating whether the employer is anonymous, i.e. the position is advertised by an agency for an unnamed company. The variable is coded manually.

0   No
1   Yes

Note: The variable is only used in Norway.

[wantsalary]

Dummy variable indicating whether the employer asks applicants to name their ideal salary for the vacant position. This variable is coded manually.

0   No
1   Yes

Note: This variable is only used in Germany.

[responsible]

Dummy variable indicating whether the job advertisement mentions that applicants will have leading responsibility in their potential new job. This information is automatically retrieved by a crawler.

0   No
1   Yes

Note: This variable is only used in Germany and Norway. Be aware that in Norway this data was only collected from February 2017 onwards.

[worktype]

Variable indicating whether the vacant position is a full-time or a part-time position. A vacancy is coded as full-time if it requires more than a certain number of working hours per week and as part-time if it requires less than that. See the table below for information on what is considered full-time in the respective countries. A vacancy is coded as "other" if there is no clear indication that it is either a full- or part-time position, i.e. if both types of work are possible.

The relevant information is retrieved by a crawler in the United Kingdom and Spain and coded manually in Norway and the Netherlands. In Germany, if no value could be assigned automatically using a crawler, the variable was coded manually based on the job description given on the website.

1   Full-time
2   Part-time
3   Other

The following table provides an overview of what is considered full-time in all countries:

Germany	Positions with more than 37,5 hours/week
Netherlands	Positions with more than 36 hours/week
Norway	Positions with more than 37,5 hours/week
Spain	Positions with more than 30 hours/week
United Kingdom	Positions with more than 35 hours/week

Note: In the Netherlands, it is impossible to distinguish between positions where only full-time work is wanted and positions in which full- and part-time is possible. All of these are coded as 1, i.e. full-time. In addition, please be aware that this variable has not been coded reliably in the Netherlands, but this will be fixed in the final version of the dataset.

4. Variables concerning the applicant

[fullname]

Variable indicating the full name of the applicant. For a list of the names we used see variable [ethnicity].

String variable

[gender]

Variable indicating the gender of the applicant.

0   Male
1   Female

[grade]

Dummy variable indicating whether the applicant finished his educational qualification with a grade considered good.

0   Grade not provided
1   Grade good

The wording of the treatment on the applicant's CV is as follows:

United Kingdom	Cook/electrician/plumber:
	• Number of GCSEs: 5 in grade treatment, 4 in control
	Payroll clerk/receptionist:
	• Number of GCSEs: 8 in grade treatment, 5 in control
	• Grades on A-level: A*/A/B in grade treatment, B/B/B in control
	High-skilled (IT, sales rep):
	• Number of GCSEs: 10 in grade treatment, 7 in control
	• Grade on A-levels: A*/A/B in grade treatment, B/B/B in control
	• Modules taken in higher education mentioned on CV for grade treatment, not mentioned in control
Spain	Cook/payroll clerk/receptionist/shop assistant/hairdresser (vocational training):
	• Nota media: 7,4
	Software developer/sales representatives (university degree):
	• Nota media: 7,2
Germany	Erweiterter Hauptschulabschluss: gut
	Mittlerer Schulabschluss: gut
	Abitur: gut
Norway	Gjennomsnittskarakter: B
	Gjennomsnittskarakter: 5
Netherlands	Cijfergemiddelde: 7.5

Note: In Spain, there is an uneven distribution of cases across the four possible combinations of the productivity (variable [treat_perf]) and grade treatment. For further information refer to the section "Country-specific remarks" at the end of the codebook.

[depprodgrade]

In Spain, the grade and performance treatments were dependent on each other. That is, until the 20th of June 2017, when [grade] = 1, [treat_perf] =1 and vice versa; and from the 21th of June 2017 onwards, when [grade] = 0, [treat_perf] =1 and vice versa. See for further information "6. Country-specific remarks".

The variable [depprodgrade] identifies the kind of dependency between the grade and performance treatments in Spain, based on the date (until or after the 20th of June 2017). This variable is set to missing for observations from other countries of study.

0   prod1-grade1 or prod0-grade0
1   prod1-grade0 or prod0-grade1

[qualmismatch]

Variable indicating the degree of adjustment between the requirements of the job offer and the candidate in terms of qualifications or skills.

A candidate is coded as being underskilled if they possess less formal qualifications or experience than required by the job, or if there is an inadequacy of his/her skills relative to the requirements of the job.

A candidate is coded as being overskilled if they have more qualifications or experience than required by the job, or there is a skill underutilization, in the sense that the candidate's skills exceed those required by the job. This variable was coded manually.

1   Underqualified or underskilled
2   Good match
3   Overqualifed or overskilled

[migrationstatus]

Variable indicating whether the applicant has a migration background.

0   Native
1   First generation immigrant
2   Second generation immigrant

A sentence to indicate their migrant status was included in the cover letter of 1st and 2nd generation applicants and worded as follows (translated and slightly adapted for each of the five countries the study was conducted in):

For 1st generation immigrants: *"I was born in [home country], but moved to [region of company] at the age of 6 and all my relevant education and training has been in [host country]."*

For 2nd generation immigrants: *"My family is originally from [home country], but I was born in [region of company] and all my education and training has been in [host country]."*

In the UK, the treatment was worded slightly differently:

For 1st generation immigrants: *"Note that although I have a [origin] background all my education and training has been in Britain since the age of six and I have the right to work in the UK."*

For 2nd generation immigrants: *"Note that although I have a [origin] background all my education and training has been in Britain and I have the right to work in the UK."*

[ethnicity]

Variable indicating the applicant's country of origin. A person's ethnicity was signaled the applicants' name, language skills and migration status (1st or 2nd generation).
In the skills section of the CV, we explicitly signal the applicant's country of origin by indicating in addition to the host country language a 2nd mother tongue. In addition, all ethnic minority applicants mentioned in their cover letters that they were either 1.5-generation or second-generation migrants (see variable [migrationstatus]) who themselves or whose parents moved from the respective country of origin to the country of destination at the age of six.

Note: In Spain, Bosnia and Herzegovina was used as a country of origin until May 2017 and replaced by Lebanon from June 2017 onwards. Moreover, the Catalan ethnic profile was only used in Catalonia, in the period between March 2018 and June 2018. In Norway, Lebanon and Morocco were used as countries of origin only from June 2017 onwards.

The following is the list of names that were used for applicants:

	In all countries:			
Code	Ethnicity	Male names	Female names	Male/Female family names
1	Albania	Arben	Valbona	Marku
2	Bulgaria	Zlatan	Nevena	Dimitrov/a
3	China	Ho-Yin	Xia	Chan
4	Egypt	Karim	Dina	Saleh
5	Ethiopia	Habtamu	Abeba	Yerga
6	France	Guillaume	Claire	Durand
7	Germany	Paul	Lisa	Schneider
8	Greece	Giorgos	Konstantina	Papadopoulos/ Papadopoulou
9	India	Sanjay	Divya	Kumar
10	Indonesia	Dian	Putri	Bintang
11	Iran	Farhad	Anisa	Ahmadi
12	Iraq	Kathem	Rana	Ahmed
13	Italy	Francesco	Valentina	Marino
14	Japan	Hiroto	Asuka	Sato
15	Lebanon	Fares	Ghada	Khodr
16	Mexico	Pedro	Guadalupe	Flores Martínez
17	Morocco	Mehdi/Said[1]	Karima/Rachida[1]	Idrissi/El Moussaoui[1]
18	Netherlands	Jeroen	Maaike	De Vries
19	Nigeria	Akintunde	Adeola	Oladejo
20	Norway	Kristian	Silje	Hansen
21	Pakistan	Tariq	Yasmeen	Anwar
22	Poland	Marek	Michalina	Kowalski
23	Rumania	Andrei	Dana	Popescu
24	Russia	Sergej	Olga	Ivanov/a
25	South Korea	Ji-Hun	Su-Min	Lee
26	Spain	Alvaro	Alba	Martínez García
27	Turkey	Enes	Elif	Aydin
28	Uganda	Wemusa	Kisakye	Ndikumana
29	United Kingdom	James	Emily	Robinson
30	USA	Matthew	Ashley	Smith
31	Vietnam	Danh	Linh	Nguyen

	In select countries:				
Code	Ethnicity	Male names	Female names	Male/Female family names	Used in
32	Bosnia and Herzegovina	Ajdin	Belma	Kovačević	ES, NO
33	Dominican Republic	Carlos Manuel	Elizabeth	Vasquez Pérez	DE, ES
34	Macedonia	Dragomir	Vesna	Angelov/a	DE, NL
35	Malaysia	Chee	Siew	Leong	DE, NL
36	Trinidad and Tobago	Toriano	Onika	Wilson	UK, DE
37	Surinam	Ricardo	Sharmila	Pinas	NL

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[1] In the United Kingdom and Germany, only the names Mehdi and Karima Idrissi were used for Moroccan applicants. In Norway, only the names Said and Rachida El Moussaoui were used for Moroccan applicants. In Spain and the Netherlands, the names Said and Rachida El Moussaoui were used for Moroccan applicants after May 22nd 2017 and the names Mehdi and Karima Idrissi were used before that date.

38	Belgium	Glenn	Lore	De Smet	NL
39	Antilles	Gregory	Sharine	Martis	NL
40	Sweden	Erik	Linnéa	Andersson	NO
41	Denmark	Henrik	Hanne	Nielsen	NO
42	Lithuania	Ivan	Elena	Mantas	NO
43	Eritrea	Aman	Segen	Tesfay	NO
44	Philippines	Reynaldo	Rowena	Reyes-Ilagan	NO, ES
45	Ukraine	Dmytro	Oksana	Melnyk	ES
46	Ecuador	Luis Alberto	María Fernanda	Guamán Espinoza	ES
47	Portugal	Nuno	Catarina	Rodrigues	ES
48	Jamaica	Lavonne	Delroy	Worrell	UK
49	Bangladesh	Farzana	Abdul	Uddin	UK
50	Somalia	Idres	Yassin	Dahir	UK, NO
51	Ireland	Erin	Brendan	O'Brien	UK
52	South Africa (50% white Afrikaans /50% black Zulu names)	Piet Bongani	Hilda Ayanda	Van Reeden Nkosi	DE
53	Catalonia	Jordi	Laia	Puig Solé	ES

[native]

Variable indicating whether the applicant is a native or an immigrant to the respective country. Derived from the variable [ethnicity].

0   Foreign
1   Native

[ethnicity7]

Variable indicating the geographical region the applicant is from. Derived from the variable [ethnicity].

0	Western Europe and US	Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, United Kingdom, United States
1	Eastern Europe and Russia	Albania, Bosnia and Herzegovina, Bulgaria, Lithuania, Macedonia, Poland, Romania, Russia, Ukraine
2	South America	Antilles, Dominican Republic, Ecuador, Jamaica, Mexico, Surinam, Trinidad and Tobago
3	South Asia	Bangladesh, India, Pakistan
4	South-East and East Asia	China, Indonesia, Japan, Malaysia, Philippines, South Korea, Vietnam
5	MENA Countries	Egypt, Iran, Iraq, Lebanon, Morocco, Turkey
6	Africa	Ethiopia, Eritrea, Nigeria, Somalia, South Africa, Uganda

[treat_perf]

Variable indicating whether the performance treatment was used.

0   No performance treatment used
1   Performance treatment used

The treatment consisted of a statement in the cover letter of the applicant that was worded as follows:

"My job as [profession] prepared me well to work under pressure. Because of the great range of duties in my current job, I am used to master new challenges and I am always eager to expand my skills. As a result of my consistently high work performance, my employer passed more responsibilities on me. For example, since last years I am responsible for training...

Cook	*new members of the kitchen staff."*
Electrician	*new apprentices."*
Payroll Clerk	*new members of the admin team."*
Plumber	*new apprentices."*
Receptionist	*new members of the front of house staff."*
Sales Representative	*new members of the sales team."*
Software Developer	*new members of the IT team."*
Store Assistant	*new members of the sales team."*
Hairdresser	*new trainees."*
Carpenter	*new apprentices."*

In the UK, there was an additional statement included on the applicant's CV that was worded as follows:

"A hard-working person, successful in meeting the targets of the company and responsible for training [new employees, exact wording see table above]. Now looking for opportunities to further develop in the [job specific] sector."

Note: In Spain, there is an uneven distribution of cases across the four possible combinations of the productivity and grade (see variable [grade]). For further information refer to the section "Country-specific remarks" at the end of the codebook.

[treat_warmth]

Variable indicating whether the warmth treatment was used.

0   No warmth treatment used
1   Warmth treatment used

The treatment consisted of a statement in the cover letter of the applicant that was worded as follows:

"My friends and colleagues [in the UK: colleagues and friends] think that I am a pleasant and social person, who gets along well with others, both at work and elsewhere. I am a team player who values a good work environment, and that is why I am always friendly and attentive to other people's needs."

In the UK, Spain and the Netherlands there was also an additional statement included on the applicant's CV that was worded as follows:

"A friendly and trustworthy person who gets on well with a wide range of people. A team player who values a good work environment."

[religion]

Variable indicating what kind of religious organization the applicant is affiliated with.

0   No religious affiliation
1   Christian
2   Muslim
3   Buddhist
4   Hindu

All applicants volunteered, but some did so in a religious organization (religion treatment), others in a neutral organization. This was worded as follows in the cover letter of applicants:

	Cook	**Electrician**	**Payroll Clerk**	**Plumber**	**Receptionist**
Neutral treatment: …of the Youth Project, a local community centre …. **Religion treatment:** … the Christian (Muslim/ Hindu/Buddhist) Youth Project, a local community centre….	I am a passionate cook, both in my professional life and in my spare time. I am an active member of **[treatment, see first column]** where I, among other things, help with the preparation of meals during various events like local fairs and open days.	I am passionate about electronics, both in my professional life and in my spare time. I am an active member of **[treatment, see first column]** where I, among other things, work as a handyman.	I am highly organized, both in my professional life and in my spare time. I am an active member of **[treatment, see first column]** where I, among other things, help with day to day administrative tasks.	I am a passionate plumber, both in my professional life and in my spare time. I am an active member of **[treatment, see first column]** where I, among other things, help with all kinds of pipe fitting tasks.	I am highly organized, both in my professional life and in my spare time. I am an active member of **[treatment, see first column]** where I, among other things, help with the planning and organization of events like local fairs and open days.
	Sales Representative	**Store Assistant**	**Software Developer**	**Hairdresser**	**Carpenter**
	I have a flair for marketing, both in my professional life and in my spare time. I am an active member	I have a flair for sales, both in my professional life and in my spare time. I am	I am passionate about computers and IT technologies, both in my professional	I am passionate about hairdressing and stylism, both in my professional life and in	I am a passionate carpenter, both in my professional life and in my spare time. I am an

of **[treatment, see first column]** where I, among other things, help with the planning of sale events and fund-raising activities like local fairs and open days.	an active member of **[treatment, see first column]** where I, among other things, help with the planning of sale events and fund-raising activities like local fairs and open days.	life and in my spare time. I am an active member of **[treatment, see first column]** where I, among other things, help with the day to day maintenance of the membership database.	my spare time. I am an active member of **[treatment, see first column]** where I, among other things, help with the planning and organization of events like local fairs and open days.	active member of **[treatment, see first column]** where I, among other things, help with building up stands and marquees for events like local fairs and open days.

There was also a phrase included on the CV of applicants that was worded as follows:

"Volunteer at [religion treatment: Christian/Muslim/Hindu/Buddhist) Youth Project"

Which religion was used for the treatment depends on the ethnicity of the applicant. The following table provides information on which religions were used for which ethnicities:

Ethnicity	Christian	Muslim	Buddhist	Hindu
Albania	X	X		
Bosnia and Herzegovina	X	X		
Bulgaria	X	X		
China	X		X	
Egypt	X	X		
Ethiopia	X	X		
France	X			
Germany	X			
Greece	X			
India		X		X
Indonesia	X	X		
Iran		X		
Iraq		X		
Italy	X			
Japan			X	
Lebanon	X	X		
Mexico	X			
Morocco		X		
Netherlands	X			
Nigeria	X	X		
Norway	X			
Pakistan		X		
Poland	X			
Rumania	X			

Russia	X	X		
South Korea	X		X	
Spain	X			
Turkey		X		
Uganda	X	X		
United Kingdom	X			
USA	X			
Vietnam	X		X	
Dominican Republic	X			
Macedonia	X	X		
Malaysia		X	X	
Trinidad and Tobago	X			X
Surinam	X			X
Belgium	X			
Antilles	X			
Sweden	X			
Denmark	X			
Lithuania	X			
Eritrea	X	X		
Philippines	X	X		
Ukraine	X			
Ecuador				
Portugal	X			
Jamaica	X			
Bangladesh		X		X
Somalia		X		
Ireland	X			
South Africa	X			
Catalonia	X			

[phenotype]

Variable indicating which phenotype was used for the photo included in the application.

Code	Phenotype	Male	Female	Female with headscarf
0	No photo	-	-	-
1	North European			
2	Central European			
3	South European			
4	North African/Turkish			
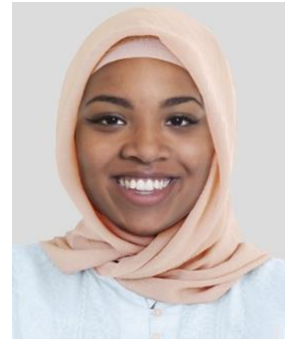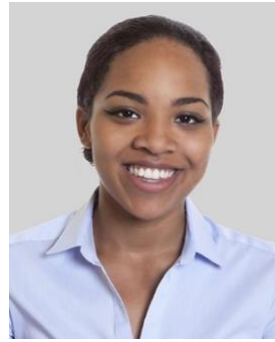
5	East African	
6	West African	
7	East Asian	
8	South Asian	
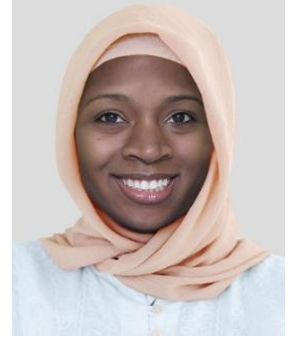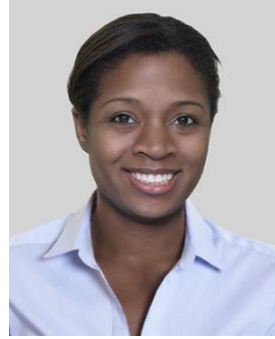
Note: In Norway and the United Kingdom photos were never included since it is not customary to do so there. 90% of applications in Germany and Spain and 50% of all applications in the Netherlands included a photo. For these applications, one of the phenotypes that fit the ethnicity were chosen randomly for the photo.

The table below details which phenotypes were used for which countries of origin.

Ethnicity	North European	Central European	South European	North African	East African	West African	East Asian	South Asian
Albania	X	X	X	X				
Bosnia and Herzegovina	X	X	X	X				
Bulgaria	X	X	X	X				
China							X	X
Egypt			X	X	X	X		X
Ethiopia					X	X		
France	X	X	X	X	X	X		X
Germany	X	X	X	X				
Greece		X	X	X				
India			X	X				X
Indonesia			X	X			X	X
Iran			X	X				X
Iraq			X	X				X
Italy	X	X	X	X				
Japan							X	X
Lebanon		X	X	X				X
Mexico		X	X	X				X
Morocco			X	X	X			
Netherlands	X	X	X	X[1]	X[1]	X[1]		
Nigeria					X	X		
Norway	X	X	X					
Pakistan			X	X	X			X
Poland	X	X	X					
Rumania	X	X	X	X				
Russia	X	X	X					
South Korea			X				X	X
Spain	X	X	X	X				
Turkey		X	X	X				X
Uganda					X	X		
United Kingdom	X	X	X	X	X	X	X	X
USA	X	X	X	X	X	X	X	X
Vietnam							X	X
Dominican Republic			X	X	X	X		X
Macedonia	X	X	X	X				
Malaysia			X	X			X	X
Trinidad and Tobago					X	X		
Surinam		X	X	X	X	X	X	X
Belgium	X	X	X	X	X	X	X	X
Antilles				X	X	X		
Sweden	X	X	X					
Denmark	X	X	X		X			
Lithuania	X	X	X					
Eritrea					X	X		
Philippines							X	X

Ukraine	X	X	X	X				
Ecuador			X	X	X			X
Portugal	X	X	X	X	X			
Jamaica	These countries of origin were only used in the UK and Norway, where no photos are included in the applications.							
Bangladesh								
Somalia								
Ireland								
South Africa	X	X	X	X	X	X	X	
Catalonia		X	X					

[1] The North, East and West African phenotypes were not used for Dutch candidates in the Netherlands. They were only used for Dutch candidates in Spain and the Netherlands.

[headscarf]

Variable indicating whether the female applicant wears a headscarf on the photo included in the CV. All males are automatically coded as missing on this variable.

0   Photo without headscarf
1   Photo with headscarf

Note: In Spain, there are extra observations of females in Muslim countries (or in countries with significant Muslim population), as headscarf and religion treatments were considered orthogonal until November 2017. For further information please refer to the section "Country-specific remarks" at the end of the codebook.

[extrahsrel]

This variable identifies cases in which [religion] = 0 and [headscarf] = 1. This treatment combination is only used in Spain.

For further information refer to the section "Country-specific remarks" at the end of the codebook.

0   Normal cases
1   Cases with [religion] = 0 and [headscarf] = 1

5. Dependent variables

[response]

Variable indicating the final response of the employer (see variable [f#_type]) to the application.

If a missed call, confirmation of receipt or "other" response is followed up by a rejection, a request for more information, a pre-invitation or an invitation, the response is overwritten. For example, a case where the feedback order was confirmation of receipt – missed call – pre-invitation is coded as a pre-invitation for this variable.

If the missed call, confirmation of receipt, or "other" response was not followed up by any of the above-mentioned feedback types, it was coded as missed call, confirmation of receipt, or "other" respectively. For example, a case where the feedback order was missed call – confirmation of receipt is coded as a missed call.

-1	Rejection
0	No response
1	Confirmation of receipt
2	Missed call
3	Additional info wanted
4	Pre-invitation
5	Invitation
6	Incomplete application
7	Detection
8	Other

[response_col]

Variable indicating the final response of the employer (see variable [f#_type]) to the application. This variable is a collapsed version of variable [response].

The variable is missing if the final feedback we received for an applicant is "incomplete application", "detection", "missed call", or "other" (see variable [response]).

-1	Rejection
0	No response
1	Confirmation of receipt
3	Additional info wanted
4	Pre-invitation
5	Invitation

[anyinterest]

Variable indicating whether the employer shows any interest in the applicant.

This variable is coded as a 1 if the employer's final response to the application (see variable [response] or [response_col]) is a request for more information, a pre-invitation or an invitation. It is coded as a 0 if the employer's first response is a rejection or if we received no response at all.

Because the variable [response] is used as a basis for this variable, if the employer's final response is a confirmation of receipt or a missed call this means that they were not followed up by any other type of response. We code both of them as 0.

0	Employer not interested
1	Employer interested

Note: This variable is missing if the first feedback we received for an applicant are "incomplete application", "detection" or "other" (see variable [f#_type]).

[invitation]

Variable indicating whether the applicant is invited by the employer.

It is coded as a 1 if the employer's first response to the application (see variable [response]) is a pre-invitation or an invitation and 0 otherwise.

| 0 | No invitation |
| 1 | Invitation |

Note: This variable is missing if the first feedback we received for an applicant are "incomplete application", "detection" or "other" (see variable [f#_type]).

6. Country-specific remarks

Spain

Issue 1: Grades and productivity treatments, concerns variables **[grade]** and **[treat_perf]**.

In contrast to the other countries, the grade and productivity treatments were dependent on each other in Spain. That is, until the 20th of June 2017, when [grade] = 1 then [treat_perf] = 1 and vice versa. To balance this out, from June 21st onwards all applications sent out in Spain use the following combination of treatments: [treat_perf]=1/[grade]=0 or [treat_perf]=0/[grade]=1. However, there is still an uneven distribution of cases across the four possible combinations of the productivity and grade treatment.

During the whole period of data collection, productivity and grades were independent from ethnicity (and the other treatments). Moreover, there is no reason to believe that performance and grades are interpreted or perceived differently by employers before and after June 2017. Hence, recommended is to use all Spanish cases. The variable **[depprodgrade]** is included in the data set to identify the kind of dependency between the productivity and grade treatments in Spain. This variable distinguishes cases where [grade] = 1 and [treat_perf] = 1 or vice versa, from cases where [grade] = 0 and [treat_perf] = 1 or vice versa, based on date.

Issue 2: Headscarf and religion (Muslim) treatments, concerns variables **[treat_religion]**, **[religion]** and **[headscarf]**. Applies only to females in countries with Muslim population. The headscarf and the religion (Muslim) treatments were considered completely orthogonal in Spain until November 2017. See table S1 for an overview of the religious treatment distribution in Spain.

Table S1: Distribution of the religion (Muslim) and headscarf treatments in Spain

	Religion treatment included	**No religion treatment**
Headscarf	*GEMM design*	*Extra observations*
No headscarf	*GEMM design*	*GEMM design*

To make up the discrepancy, more observations that follow the GEMM design (i.e. Muslims that have headscarves and people without religious treatment that have no headscarf) were collected during November and December 2017. However, there are still cases in the Spanish data of women with no religion treatment that wear a headscarf. This treatment combination was not used in the other four countries.

Solution: Cases with [headscarf]=1 and [religion]=0 are identified by the variable **[extrahsrel]** and can be removed from the data set if required.

Appendix

A.1. Search terms for vacancies (by country and occupation)

The following keywords were used to identify relevant vacancies to apply to on the job portals. For more information on the occupations used, please refer to the variable [occupation].

United Kingdom

Table A1.1: Search terms for UK job portals by occupation

Occupation	Search terms
Cook	Cook, chef de partie, sous chef, chef
Electrician	-
Payroll Clerk	Payroll officer, payroll clerk, wages clerk, payroll administrator, payroll accountant, payroll advisor, payroll specialist, bookkeeper, accounts assistant, junior accountant, office administrator
Plumber	-
Receptionist	Receptionist, front of house, hotel receptionist
Sales Representative	Sales representative, sales agent, field sales, marketing assistant
Software Developer	Software developer, developer, software engineer, system analyst, system engineer, system programmer, application programmer, software architect, application developer
Store Assistant	Sales assistant, shop assistant, retail assistant, store assistant, store staff, customer service sale, cashier
Hairdresser	-
Carpenter	-

Spain

- *Cook:* cocinero
- *Payroll clerk:* administrativo, secretario, contable
- *Receptionist:* recepcionista
- *Sales representative:* comercial
- *Software developer:* informático, java
- *Store assistant:* dependiente
- *Hairdresser:* peluquero

Germany

- *Cook:* Koch, Köchin, Sous chef, Chef de Partie
- *Payroll clerk:* Bürokaufmann, Bürokauffrau, Lohnabrechnung, Lohnbuchhaltung, Personalsachbearbeiter, Lohnbuchhalter, Bürofachkraft, Bürofachwirt

- *Receptionist:* Hotelfachfrau, Hotelfachmann, Hotelfachkraft, Hotelfachkräfte, Konferenzservice, Rezeption, Empfang
- *Sales representative:* Vertriebsagent, Vertriebsfachmann, Vertriebsberater, Sales manager, Sales representative, Key account manager, Account manager, Marketing assistant
- *Software developer:* Softwareentwickler, Informatiker, Programmierer, Softwareingenieur, Anwendungsentwickler, Anwendungsprogrammierer
- *Store assistant:* Kassierer, Verkäufer, Fachverkäufer
- *Hairdresser:* Friseur

The Netherlands

Keywords marked with a * were used for manual searches of for vacancies within the job data base.
- *Cook:* basiskok*, kok*, zelfstandig werkend kok*, chef de partie, restaurantkok, instellingskok*, dieetkok, scheepskok
- *Electrician:* elektromonteur*, technische dienst, onderhoudselektricien*, onderhoudselektriciën, monteur elektrotechnische panelen, monteur elektrische installaties, monteur brandalarmsystemen, monteur bliksembeveiliging, monteur beveiligingsinstallaties, lichtreclamemonteur, installateur*, elektricien*, elektriciën, beveiligingsmonteur, beveiligingsinstallateur, allround monteur huisaansluitingen, alarminstallateur, aardingsmonteur
- *Payroll Clerk:* administratief medewerker*, administrateur*, administratief*, administratief assistent, kantoor-assistent, kantoormedewerker, kantoorhulp, kantoorbediende, kantoorassistent, waardencontroleur, boekhouder, assistent-accountant*, controller*, assistent controller
- *Plumber:* loodgieter*, zwembadinstallatiemonteur, zinkwerker, watertechnisch installateur, verwarmingsmonteur, vakman buisleidingen, sprinklermonteur, sanitairmonteur*, rioolreparateur, rioolmonteur, rioolaanlegger, rioloog, rioleringsmedewerker, puttenbouwer, pijpleidingwerker*, pijplasser, pijpfitter*, onderhoudsmonteur verwarming, onderhoudsmonteur dakwerk, sanitair, verwarming, gas- en waterleiding, onderhoudsloodgieter, monteur gas, monteur centrale verwarming woningbouw, monteur centrale verwarming utiliteitsbouw, kabelwerker, kabellegger, installateur cv, gawalomonteur, gastechnisch installateur, gasmonteur, gasfitter, fitter, eerste monteur warmte, distributiemonteur gas, cv-monteur, buizenlegger, buisleidinglegger, badkamermonteur, assistent-loodgieter
- *Receptionist:* hotelreceptionist*, receptionist*, medewerker reserveringen, informatrice, informatiebaliemedewerker, informant, frontofficemedewerker, customerservicemedewerker, baliemedewerker*, servicebaliemedewerker, serviceadviseur, publieksmedewerker, klantenservicemedewerker*, klanteninformatiemedewerker, inlichtingenmedewerker, klachtenbehandelaar*
- *Sales representative:* accountmanager*, commercieel medewerker, commercieel manager*, sales medewerker, sales manager*, sales*, sales executive, marketing manager, marketingmanager, vertegenwoordiger*, plugger, exportmanager, exporteur, medewerker verkoop
- *Software developer:* software specialist*, software ontwikkelaar*, software ontwerper, software consultant, software architect, software developer, software designer*, softwarespecialist, softwareontwikkelaar, softwareontwerper, softwareconsultant, softwarearchitect, softwaredeveloper, softwaredesigner, applicatiespecialist, applicatieontwikkelaar, applicatieontwerper, applicatieconsultant, applicatiearchitect, applicatiedesigner, applicatie specialist*, applicatie ontwikkelaar*, applicatie ontwerper, applicatie consultant, applicatie architect, applicatie developer, applicatie designer, application specialist, application ontwikkelaar, application ontwerper, application consultant, application architect, application developer, application designer
- *Store assisant:* Verkoopmedewerker*, verkoper*, caissiere*, kassiere*, caissière, kassière

- *Hairdresser:* kapper*, salonassistent, pruikenmaker, kappershulp, haarwerkspecialist, haarstylist*, afrokapper
- *Carpenter:* timmerman*, werkplaatstimmerman, wandensteller*, wand- en plafondmonteur, trappensteller*, timmerkracht*, standbouwer, scheepstimmerman, scheepsinterieurbouwer, scheepsbeschieter, rolluik- en zonweringinstallateur, restauratietimmerman, kozijnmonteur*, kozijnenzetter, keukenmonteur, jachtbouwer, houtskeletbouwer, grafkistenmaker, decorbouwer, bouwtimmerman, betontimmerman

Norway

The biggest job portal used to send out applications in Norway operates on a list of category filters (checkboxes). In the following table A1.1, the right-hand column indicates these filters, in the following format: *Main category*: Subcategory, subcategory, subcategory.

Table A1.2: Search terms for Norwegian job portals by occupation

Occupation	Keywords	Category filter
Cook	Kokk	*Mat og servering*: Kjøkken- og kantinemedarbeider.
Electrician	Elektriker gr. L	*Håndarbeider*: Elektriker
Payroll Clerk	Lønnskonsulent Regnskapsmedarbeider Regnskapsfører Regnskapskonsulent Regnskapskontrollør	*Kontor og administrasjon*: Kontorarbeid. *Økonomi og regnskap*: Controller, Lønn, Regnskap, Økonomistyring og budsjettering.
Plumber	Rørlegger VVS	*Håndarbeider*: Rørlegger
Receptionist	Resepsjonist	*Hotell og overnatting*: Resepsjon. *Kontor og administrasjon*: Resepsjon.
Sales Representative	Selger (engross) Markedsføring og reklame Markedsfører (agent)	*Salg*: Løsningssalg, Produktsalg, Teknisk salg
Software Developer	Systemutvikler IT-konsulent IT-rådgiver	*IT-drift og vedlikehold*: Drift/operation. *IT-utvikling*: Database, Front-end, IT-sikkerhet, QA-testing, Systemariktekt, Utvikler (generell)
Store Assistant	Butikkmedarbeider	*Butikkansatt*
Hairdresser	Frisør	*Frisør*
Carpenter	Tømrer	*Håndarbeider*: Snekker/Tømrer