Discrimination sur le marché du travail bruxellois : analyse sectorielle basée sur un test par correspondance

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Résumé complet (FR)

1. Introduction

La discrimination reste un problème grave sur les marchés du travail contemporains. Malgré la diversité croissante de la main-d'œuvre mondiale et les nombreuses interventions politiques, de nombreuses personnes issues de différents groupes minoritaires, y compris les personnes plus âgées et les personnes d'origine étrangère, sont encore victimes d'une discrimination importante sur le marché du travail. En ce qui concerne le sexe des personnes, les études suggèrent des effets différents en fonction de facteurs tels que l'organisation et le ratio des genres au sein de la profession. Néanmoins, en moyenne, les hommes auraient moins de chances d'être embauchés que les femmes. Malgré de nombreuses recherches concernant la discrimination sur le marché du travail, l'importance relative des caractéristiques personnelles susmentionnées n'a été étudiée que de manière limitée. Or, il s'agit d'une thématique importante d'un point de vue politique.

En outre, les individus sont souvent confrontés à une discrimination fondée sur des caractéristiques multiples, telles que l'âge et l'origine ethnique étrangère ou l'âge et le sexe, et la discrimination qu'ils subissent éventuellement est influencée par des caractéristiques propres à l'environnement et à l'employeur, telles que le contexte métropolitain et le type de secteur dans lequel l'entreprise opère. Ces éléments peuvent aggraver ou justement compenser la discrimination. Toutefois, les effets d'interaction entre plusieurs facteurs et le rôle modérateur des caractéristiques de l'environnement et de l'employeur ne sont toujours pas suffisamment étudiés. Cela met en évidence la complexité du problème et la nécessité de poursuivre l'étude.

2. Région de Bruxelles-Capitale

Située au centre du pays, la Région de Bruxelles-Capitale est une des trois régions en Belgique et est composée de 19 communes dont Bruxelles, la capitale de la Belgique. La région fait partie des Communautés flamande et française, de sorte que le néerlandais et le français sont toutes deux des langues officielles dans la région, y compris dans l'enseignement. Bien que la région soit relativement petite géographiquement (162 kilomètres carrés), elle est de loin la plus densément peuplée avec environ 7.500 habitants au kilomètre carré.

La population bruxelloise est hyperdiversifiée : 36 % des résidents ne sont pas de nationalité belge et proviennent de 183 pays différents. Plus de 55 % des résidents de nationalité étrangère ont une nationalité hors UE-27. En outre, environ 40 % des Bruxellois de nationalité belge ont également une nationalité étrangère et/ou au moins un parent ayant une première nationalité étrangère enregistrée. Parmi les personnes de nationalité étrangère résidant dans la Région de Bruxelles-Capitale, 75 % ont entre 18 et 64 ans, contre 59 % pour les personnes de nationalité belge. En outre, la région de Bruxelles-Capitale se caractérise par une population relativement jeune, avec seulement 13 % de la population âgée de 65 ans ou plus, contre 21 % et 20 % respectivement dans

les Régions flamande et wallonne. Une grande partie (62 %) des résidents de la région appartiennent à la tranche d'âge des 20-64 ans, donc bien plus que dans les Régions flamande (57 %) et wallonne (58 %). En ce qui concerne la répartition des genres dans la région, les hommes et les femmes représentent chacun environ 50 % de la population bruxelloise.

En outre, de nombreuses personnes se rendent chaque jour dans la Région de Bruxelles-Capitale pour y travailler, avec plus de 400.000 navetteurs en 2022 et près de la moitié (49,5 %) de tous les emplois occupés par des Flamands ou des Wallons. Cette situation présente des opportunités et des défis supplémentaires pour la région, car les travailleurs des Régions flamande et wallonne apportent avec eux un éventail diversifié de perspectives et de cultures liées à leur lieu de résidence.

Sur le plan économique, la région compte le plus grand nombre d'organisations actives assujetties à la TVA par kilomètre carré en Belgique. En outre, la Région bruxelloise abrite un mélange intéressant d'organisations privées et publiques (des trois régions). Néanmoins, par rapport aux Régions flamande et wallonne, la région souffre d'un taux de chômage relativement élevé, en particulier chez les jeunes et les personnes de nationalité non européenne, ainsi que d'un faible taux d'activité, principalement chez les jeunes et les femmes.

3. Objet de l'étude

Cette étude examine la prévalence de la discrimination ethnique, liée à l'âge et au sexe sur le marché du travail dans la Région de Bruxelles-Capitale. En outre, l'étude vise à étudier l'importance relative de ces facteurs de discrimination, ainsi que leurs éventuels effets d'interaction. En outre, dans cette recherche, nous nous concentrons sur trois secteurs proéminents de l'économie bruxelloise, tant dans le secteur public que dans le secteur privé, afin d'examiner les différences entre les pratiques discriminatoires d'un secteur à l'autre. Concrètement, cette recherche se concentre sur les secteurs « Commerce de gros et de détail ; réparation d'automobiles et de motocycles » (nace G), « Activités de services administratifs et de soutien » (nace N), et le secteur public « Administration publique et défense ; sécurité sociale obligatoire » (nace O). Ces trois secteurs ont été sélectionnés en raison de leur part importante dans l'emploi total de la Région de Bruxelles-Capitale. En 2022, le commerce de gros et de détail (nace G), les services administratifs et de soutien (nace N) et le secteur public (nace O) représentaient respectivement 8,2 %, 10,5 % et 16,5 % de tous les travailleurs occupés dans la Région de Bruxelles-Capitale.

L'étude opère une expérimentation par correspondance (test de situation). Le plan d'expériences consistait à envoyer des CV et des lettres de motivation standardisés à des employeurs ayant un poste vacant dans la région, avec des variations dans l'origine ethnique, l'âge et le sexe des candidats fictifs. Les CV et les lettres de motivation ont été soigneusement conçus pour être comparables (à l'exception des manipulations des variables pertinentes) et réalistes.

Lors de la conception de l'expérience, la population hyperdiversifiée de la Région de Bruxelles-Capitale a été prise en compte. Concrètement, l'ethnicité a été différenciée en fonction de

l'origine belge et étrangère, avec une subdivision supplémentaire en ethnicité polonaise (UE-27) et marocaine (non-UE). Ces deux ethnicités étrangères spécifiques ont été choisies parce que les demandeurs d'emploi provenant d'Europe de l'Est et de pays maghrébins sont relativement plus présents dans les chiffres pour respectivement de très courtes périodes d'inactivité (moins de six mois) et de longues périodes d'inactivité (plus de douze mois) que les demandeurs d'emploi d'origine belge dans la Région de Bruxelles-Capitale. De plus, les Maghrébins représentent près d'un cinquième de la population bruxelloise en âge de travailler. L'appartenance ethnique d'un candidat n'était reconnaissable que par son nom. Ainsi, tous les candidats fictifs sont nés à Bruxelles (Belgique), ont étudié dans la Région et y ont construit leur carrière professionnelle. Compte tenu du contexte bilingue de la Région de Bruxelles-Capitale, nous avons sélectionné des noms communs français (wallons) et néerlandais (flamands) pour les candidats d'origine belge. Le sexe des candidats (homme ou femme) n'était également reconnaissable qu'à travers leur nom. Le facteur âge a varié entre 38 et 56 ans durant l'étude, avec une différence de six ou douze ans entre les deux candidats d'une même paire. Ces limites d'âge reposent sur deux arguments principaux. Premièrement, il est difficile, pour les candidates (femmes), de moins de 38 ans de faire la distinction entre la discrimination fondée sur le sexe et celle fondée sur la fécondité.[*] Deuxièmement, les employeurs peuvent recevoir des subventions supplémentaires pour l'embauche de candidats plus âgés (57-65 ans), ce qui peut conduire à une sous-estimation de la discrimination fondée sur l'âge. Dans le CV du candidat le plus âgé de chaque paire, une expérience supplémentaire non pertinente a été ajoutée afin d'assurer que les deux CV ne diffèrent pas en termes d'expérience pertinente.

Les réponses des employeurs aux candidatures envoyées par messagerie téléphonique et par e-mail ont été soigneusement suivies. A chaque fois, une distinction a été faite entre une réponse positive au sens strict (une invitation à un entretien d'embauche) et une réponse positive au sens large (toute réponse positive, par exemple une invitation à un entretien d'embauche, une demande d'informations complémentaires ou de contact, une offre d'emploi alternative). Il est important de noter que nous avons informé les employeurs concernés du retrait volontaire du candidat de la procédure de sélection par e-mail le plus rapidement possible en cas de réponse positive, afin de minimiser les coûts pour les employeurs.

4. Collecte de données

Entre avril 2023 et février 2024, 432 paires de candidatures (correspondant à 864 candidatures individuelles) ont été envoyées pour des offres d'emploi en Région de Bruxelles-Capitale. Ces offres d'emploi avaient toutes été émises par des entreprises appartenant aux trois secteurs sélectionnés : « Commerce de gros et de détail ; réparation d'automobiles et de motocycles » (nace G),

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[*] Sur la base de cette recherche, nous ne pouvons tirer aucune conclusion quant à une éventuelle discrimination à l'encontre des personnes âgées de moins de 38 ans. L'interaction possible entre le sexe et le jeune âge n'entre pas non plus dans le cadre de cette étude, comme, par exemple, la discrimination fondée sur la fécondité et les responsabilités familiales.

« Activités de services administratifs et de soutien » (nace N), et le secteur public « Administration publique et défense ; sécurité sociale obligatoire » (nace O).

Les offres d'emploi ont été tirées des principaux canaux de recherche d'emploi en Belgique, à savoir les services publics de l'emploi de la Région flamande (VDAB), de la Région wallonne (Le FOREM), de la Région de Bruxelles-Capitale (Actiris) et de la Communauté allemande (ADG). Ces sites web ont été complétés par d'autres sources, telles que les sites web d'organisations du secteur public.

Lors de la sélection des postes vacants, une attention particulière a été accordée au lieu d'emploi et à l'expérience requise. En effet, seules les offres d'emploi dont le lieu de travail se situait dans la Région de Bruxelles-Capitale et les offres d'emploi nécessitant une certaine expérience avaient été retenues. Les offres d'emploi pour des postes junior (≤5 ans d'expérience) n'ont pas été retenues, car tous les candidats fictifs de l'expérience étaient âgés de 38 ans ou plus et possédaient une expérience pertinente dans la profession pour laquelle ils postulaient. Par conséquent, les candidats fictifs étaient surqualifiés pour les postes juniors. En outre, les offres d'emploi nécessitant des informations supplémentaires lors de la phase initiale de candidature, telles qu'un(e) (preuve de) diplôme, un permis de conduire, un certificat de bonne vie et mœurs, n'ont pas pu être incluses dans l'expérience. Ce type de documents n'est généralement pas disponible pour une étude par correspondance en raison de considérations éthiques et, plus important encore, de l'interdiction de falsifier ces documents. Dans notre expérience, la barrière à l'entrée se reflétait principalement dans les offres d'emploi du secteur public, où un numéro national et/ou d'autres preuves de diplômes sont souvent exigés.

Enfin, nous avons postulé pour maximum une offre d'emploi par employeur dans le secteur privé et deux offres d'emploi par employeur dans le secteur public, afin de réduire les coûts pour les employeurs et de minimiser les risques qu'on démasque l'expérience. Les candidatures ont été envoyées par e-mail ou via des outils en ligne, avec un délai de 12 à 24 heures entre deux candidatures.

5. Résultats

5.1. Statistiques descriptives

Notre échantillon se compose essentiellement de petites organisations comptant jusqu'à 250 employés (80 %) et d'organisations du secteur privé (86,1 %). Sur l'ensemble des candidats fictifs, 14 % ont reçu une invitation à un entretien d'embauche (réponse positive au sens strict), 36 % ont reçu une réponse positive (réponse positive au sens large, telle qu'une invitation à un entretien d'embauche et une demande d'informations complémentaires) et 9 % ont reçu un refus formel. Les 55% restants des candidats fictifs n'ont reçu aucune réponse à leur demande (dans les 30 jours suivant leur candidature).

Les statistiques montrent des chiffres similaires dans les trois secteurs, mais avec quelques différences intéressantes. Premièrement, les candidats fictifs possèdent plus souvent un diplôme de

baccalauréat lorsqu'ils postulent dans le secteur public que dans le secteur privé, à savoir 92 % contre 58 % respectivement. Surtout le secteur privé du commerce de gros et de détail (nace G) fait état d'une proportion relativement faible de candidats fictifs titulaires d'un baccalauréat (43%). Deuxièmement, il y a une différence de langue dans laquelle les candidats ont postulé, la majorité des candidats fictifs utilisant le néerlandais dans le secteur public (60 %) et le français dans le secteur privé du commerce de gros et de détail (nace G) (72 %). Dans le secteur privé des services administratifs et de soutien (nace N), les candidats fictifs ont postulé presque aussi souvent en néerlandais (54%) qu'en français (47%). Troisièmement, les organisations publiques emploient en moyenne plus de travailleurs que les organisations privées. Enfin, dans les organisations publiques, davantage de candidats sont invités à des entretiens : 23 % des candidats sont invités, contre 13 % dans le secteur privé. En outre, les employeurs du secteur public envoient plus souvent un refus formel. Plus précisément, 17% des candidats du secteur public et 8% des candidats du secteur privé ont reçu un message officiel de refus par e-mail ou par boîte vocale. C'est dans le secteur du commerce de gros et de détail (nace G) que l'on trouve la plus forte proportion (65 %) de candidats n'ayant pas reçu de réponse dans les 30 jours suivant leur candidature, contre 48 % dans le secteur public (nace O) et 46 % dans les services administratifs et de soutien (nace N).

5.2. Analyses bivariées et multivariées

Les résultats de notre recherche révèlent que les candidates féminines ont systématiquement plus de chances d'être invitées à un entretien d'embauche ou de recevoir une réponse positive que les candidats masculins. En ce qui concerne l'appartenance ethnique, nos résultats montrent que seuls les candidats d'origine marocaine (hors UE) vivent une discrimination à l'embauche en comparaison avec les candidats d'origine belge. Cela se traduit à la fois par une moindre chance d'être invité à un entretien et par une moindre chance d'obtenir une réponse positive dans l'ensemble. Aucune discrimination à l'embauche n'a été constatée pour les candidats d'origine polonaise (UE) en comparaison avec les candidats portant un nom à consonance belge. En ce qui concerne l'âge, notre analyse montre que seuls les candidats âgés de 50 ans ou plus (différence d'âge de 12 ans par rapport aux candidats plus jeunes) subissent des effets négatifs sur le marché du travail bruxellois. Lorsque nous comparons les effets associés à l'origine ethnique marocaine, à une différence d'âge de 12 ans et à un sexe masculin, nous ne constatons aucune différence statistiquement significative. Plusieurs analyses de robustesse ont été réalisées. Ces résultats confirment des conclusions faites antérieurement.

Dans les analyses des sous-échantillons comprenant des organisations du secteur public (nace O) et des secteurs privés du commerce de gros et de détail (nace G) et des services administratifs et de soutien (nace N), nous avons uniquement observé des effets significatifs (discriminatoires) parmi les organisations des secteurs privés. Cela suggère une inégalité de traitement significative d'un point de vue statistique au sein des secteurs privés. Dans les deux secteurs, nous constatons que l'ethnicité marocaine, le fait d'avoir plus de 50 ans et d'être un homme ont des effets désavantageux sur les opportunités initiales du marché du travail. Dans le secteur public, nous

n'observons pas d'effets significatifs. Toutefois, d'autres recherches montrent que ces effets ne sont pas différents de ceux observés dans le(s) secteur(s) privé(s) d'un point de vue statistique. Le manque de signification dans le sous-échantillon du secteur public semble être lié au nombre limité d'observations. Bien que nous trouvions uniquement des preuves de discrimination à l'embauche dans les secteurs privés du commerce de gros et de détail (nace G) et des services administratifs et de soutien (nace N), nous ne pouvons pas affirmer avec certitude qu'il n'y a pas de discrimination à l'embauche dans le secteur public (nace O).

En outre, nous ne trouvons aucune preuve solide de l'intersectionnalité entre l'ethnicité, l'âge et le sexe par-delà les différentes variables de résultats et secteurs de notre étude. Bien qu'ils ne soient que suggestifs, les résultats suggèrent de faibles effets d'interaction pour certains résultats. Pour le résultat « invitation à un entretien d'embauche », nous constatons un faible effet d'interaction entre l'ethnicité et le sexe (significatif au niveau de 10 %), ce qui indique que l'effet négatif de l'ethnicité étrangère est plus faible (voire complètement compensé) pour les hommes. Pour le résultat « toute réponse positive », nous constatons un faible effet d'interaction entre l'ethnicité et l'âge (à un niveau de signification de 10 %), ce qui indique que l'effet négatif de l'ethnicité étrangère est plus faible pour les candidats plus âgés. Cette constatation peut être attribuée au fait que tous les candidats fictifs de notre expérience sont nés, ont étudié et ont travaillé dans la Région de Bruxelles-Capitale. Par conséquent, les candidats plus âgés d'origine étrangère peuvent avoir un avantage sur leurs homologues plus jeunes ayant un nom à consonance étrangère. Dans les analyses des sous-échantillons, nous ne trouvons à nouveau aucune preuve concluante selon laquelle les effets discriminatoires de l'ethnicité, de l'âge et du sexe s'amplifient ou s'affaiblissent mutuellement.

6. Recommandations politiques

Les résultats de l'étude ont des implications importantes pour l'élaboration des politiques. Tout d'abord, les résultats montrent que même à caractéristiques similaires, telles que le lieu de naissance, la formation et l'expérience professionnelle au sein de la Région de Bruxelles-Capitale, il existe toujours une discrimination à l'embauche fondée sur l'ethnicité, en particulier à l'encontre des personnes d'origine non européenne. Nous avons également constaté que les hommes et les candidats plus âgés (12 ans de plus), malgré des caractéristiques de base et des compétences égales (y compris les compétences numériques), ont moins de chances sur le marché du travail. Cela indique l'existence de préjugés persistants liés à l'ethnicité, au sexe et à l'âge, qui vont au-delà de, notamment, la simple compatibilité des qualifications et des compétences perçues.

Deuxièmement, nous avons constaté que les effets associés à l'ethnicité marocaine, à une différence d'âge de 12 ans et au sexe masculin n'étaient pas significativement différents les uns des autres. Cela suggère que les décideurs politiques ne doivent pas se concentrer sur un seul de ces facteurs de manière isolée, mais plutôt adopter une politique holistique qui s'attaque à un large éventail de pratiques discriminatoires au cours du processus de recrutement. Néanmoins, il est également important ici de prêter une attention particulière aux personnes qui combinent plusieurs

caractéristiques et accumulent donc des effets négatifs (par exemple, un homme plus âgé d'origine marocaine).

Cela peut inclure différents aspects, tels que la stimulation de la prise de conscience et la formation sur les préjugés et les stéréotypes. En effet, divers préjugés inconscients peuvent se glisser dans les processus d'évaluation. En outre, les politiques peuvent s'attacher à informer les employeurs sur les lois interdisant la discrimination, notamment la loi antiracisme, la loi sur l'égalité entre les hommes et les femmes et la loi contre la discrimination. Ces éléments peuvent être mis en œuvre par des actions de sensibilisation sous la forme de campagnes d'affichage et d'événements. Il est important de mettre en évidence la valeur ajoutée de la diversité au sein de l'entreprise.

En outre, un cadre réglementaire pour les candidatures anonymes pourrait être envisagé.[†] Dans le cas des candidatures anonymes, les caractéristiques personnelles telles que le sexe, l'ethnicité ou l'âge (pour lesquelles la discrimination est interdite par la loi) sont supprimées du CV avant qu'il ne soit évalué. Ces informations peuvent être omises par les candidats eux-mêmes ou par l'organisation (pendant la candidature via une plateforme de candidature en ligne où les caractéristiques personnelles ne sont pas demandées ou après la candidature via un système TIC ou manuellement par une personne non impliquée dans l'évaluation des candidats). En Belgique, Accent, une société de placement de talents, a introduit le CV anonyme en février 2023 (Trends, 2024). L'entreprise fait déjà état d'un impact favorable de cette mesure (Accent, 2024). Néanmoins, l'impact de cette mesure doit faire l'objet d'un examen approfondi, car les recherches suggèrent que si les CV anonymes peuvent effectivement réduire certaines formes de discrimination, ils peuvent déplacer la discrimination à un stade ultérieur du processus de recrutement.

En outre, les politiques peuvent se concentrer sur la stimulation de la diversité et de l'inclusion sur le lieu de travail. Cette stratégie est particulièrement fructueuse si l'exposition à des groupes divers dans la société aboutit à moins de préjugés et de discrimination (selon la « théorie du contact »). Toutefois, si l'exposition à la diversité exacerbe la discrimination (ce que l'on appelle la « discrimination par la visibilité »), cette stratégie est inefficace. Bien que des recherches limitées appuient la théorie de la « discrimination par la visibilité », il est essentiel de poursuivre les recherches.

En outre, il est important de surveiller l'évolution des pratiques discriminatoires à l'embauche sur le marché du travail bruxellois. L'un des moyens d'y parvenir consiste à réaliser des tests de situation auprès d'un large groupe d'entreprises actives sur le marché du travail bruxellois, qu'elles appartiennent ou non à un secteur particulier. Il est important de faire remarquer que l'utilisation de tests de situation pour tester, contrôler et éventuellement sanctionner des entreprises individuelles n'est pas une méthode efficace ou équitable. Ceci s'explique principalement par

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[†] Veuillez noter que les CV anonymes ne doivent pas être confondus avec les tests de situation (expériences par correspondance). L'utilisation de CV anonymes est donc une mesure (politique) visant à lutter contre la discrimination, tandis que les tests de situation sont une méthode de recherche visant à détecter la discrimination.

deux raisons : (1) il faut un nombre très élevé d'observations pour identifier la discrimination à l'embauche avec une certitude suffisante, (2) les résultats de ces tests de situation sont limités aux caractéristiques spécifiques testées et (3) dans le cas de tests de situation répétés dans une seule organisation, la probabilité de découverte de l'expérience et les coûts pour l'employeur concerné augmentent de manière substantielle. En outre, la mise en place de tests de situation est une affaire technique qui requiert de l'expertise et les chercheurs universitaires sont encouragés à obtenir l'approbation éthique de leur établissement d'enseignement pour ces expériences, ce qui est souvent un défi.

Enfin, sur la base d'analyses sectorielles, nous avons observé des pratiques discriminatoires dans les secteurs privés du commerce de gros et de détail (nace G) et des services administratifs et de soutien (nace N). Il semble donc important que la politique surveille de plus près ces secteurs. En outre, sur la base de cette étude, nous ne pouvions pas exclure qu'il y ait de la discrimination dans le secteur public, ainsi que dans les secteurs non inclus dans l'expérience. Une fois de plus, nous insistons sur l'importance d'une politique holistique.

7. Suggestions pour d'autres recherches

Malgré les résultats intéressants et innovants, il est important que des recherches complémentaires soient menées pour accompagner les candidats à l'emploi, les employeurs et les gouvernements dans la réduction de la discrimination sur le marché du travail. La présente étude a examiné comment une ethnicité européenne non belge (polonaise) ou une ethnicité non européenne (marocaine) affecte les chances des candidats sur le marché du travail. Si les effets négatifs observés pour les candidats d'origine marocaine peuvent indiquer que des pays non membres de l'UE se trouvent dans une situation similaire à celle du Maroc, il est important d'examiner l'impact des différentes ethnicités sur les opportunités offertes sur le marché du travail. Il peut également y avoir des différences dans les possibilités offertes sur le marché du travail en fonction de l'appartenance ethnique des non-Européens. Pour les ethnicités UE, nous soupçonnons également des différences au niveau des opportunités du marché du travail en fonction de l'ethnicité spécifique de l'UE. D'autres recherches peuvent alimenter le débat en explorant un éventail plus large de groupes ethniques.

En outre, tous les candidats fictifs de notre expérience sont nés dans la Région de Bruxelles-Capitale. Et tous les candidats ont fait leurs études et travaillé dans la région. Par conséquent, les éventuelles différences au niveau des opportunités sur le marché du travail liées à la compatibilité des diplômes et à la nationalité (et/ou au pays de naissance), entre autres, n'ont pas été étudiées. De nouvelles recherches axées sur le pays d'origine des candidats et/ou sur le lieu où ils ont obtenu leur diplôme (en Belgique, en Europe ou en dehors de l'Europe) pourraient compléter notre recherche. Par ailleurs, notre étude s'est caractérisée par un faible nombre d'observations dans le secteur public, ce qui n'a pas permis d'effectuer des analyses approfondies par secteur. Il semble donc nécessaire de poursuivre les recherches dans ce domaine.

En outre, nous encourageons les recherches futures sur l'impact des candidatures anonymes à la fois sur la probabilité d'être embauché (réponse positive à une candidature, y compris une invitation à un entretien) et sur les offres d'emploi effectives, afin d'explorer ainsi des solutions visant à lutter contre la discrimination sur le marché du travail.

En outre, étant donné le contexte métropolitain de la Région de Bruxelles-Capitale, la recherche sur les facteurs contextuels est cruciale. Il convient alors d'examiner spécifiquement l'impact de l'exposition à divers groupes de la société sur la discrimination sur le marché du travail. L'examen de ces facteurs contextuels peut contribuer à l'élaboration de politiques efficaces visant à promouvoir la diversité et l'inclusion sur le lieu de travail. En outre, des recherches complémentaires sur les mécanismes sous-jacents sont nécessaires pour mieux comprendre les pratiques discriminatoires observées, ainsi que pour informer les décideurs politiques. Les mécanismes qui devraient certainement être explorés ici sont la théorie du capital humain sur les connaissances et les compétences acquises (perçues) et la théorie de la signalisation sur les connaissances et les compétences innées (perçues).

En outre, il convient de suivre l'évolution de la discrimination sur le marché du travail bruxellois. Toutefois, si l'expérience est répétée, il convient de prendre particulièrement en considération les coûts pour les employeurs concernés et la probabilité croissante de détection. Il est donc conseillé de prévoir une période plus longue entre deux mesures et/ou d'exclure les entreprises qui ont déjà été impliquées dans des tests par correspondance des études de suivi.

Les suggestions précédentes pour les recherches ultérieures peuvent être explorées (entre autres) par le biais d'expériences de choix. Plus précisément, les expériences par correspondance et la recherche par vignettes représentent des pistes intéressantes. Les deux types d'expériences présentent aux répondants - des employeurs potentiels - des candidatures fictives qui varient (entre autres) en fonction des caractéristiques recherchées (par exemple, l'appartenance ethnique, la nationalité, l'âge et le sexe). La principale distinction entre ces deux approches expérimentales est le consentement éclairé. Dans les expériences par correspondance, des paires de candidatures fictives similaires sont envoyées à des organisations pour des offres d'emploi réelles, sans que les employeurs ne sachent qu'ils participent à l'expérience. Les réponses des employeurs donnent un aperçu réel de leurs préférences. Dans la recherche par vignettes, les employeurs participent volontairement à un questionnaire dans lequel ils lisent une description de poste hypothétique et évaluent ensuite des candidats fictifs. Étant donné que les employeurs consentent à la recherche, cette méthode est moins sujette aux considérations éthiques. En outre, cette méthode permet de poser des questions supplémentaires pour mieux comprendre les mécanismes sous-jacents. Néanmoins, on ne peut exclure que les résultats soient influencés par un comportement

socialement souhaitable.‡ Ces deux types d'expériences fournissent aux chercheurs des outils précieux pour comprendre les préférences et la prise de décision sur le marché du travail.

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‡ La recherche montre que les effets observés des caractéristiques des candidats sont similaires entre la recherche par vignettes et la recherche par correspondance.

Academic article (ENG)

The relative rates of ethnic, age and gender discrimination and their intersectionality: a factorial field experiment in the Brussels Capital Region§

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Abstract. This study investigates the relative rates of ethnic, age, and gender discrimination, as well as their intersectionality in three prominent sectors in the metropolitan context of the Brussels Capital Region. The research employs a correspondence experiment to estimate the causal impact of ethnicity (Polish or Moroccan versus Belgian), age (6- or 12-year age gap with younger applicants aged 38 or 44), and gender (male or female) on the likelihood of receiving a job interview invitation or any positive response. Our findings reveal female applicants are more likely to be invited to a job interview or receive a positive response compared to male applicants. Regarding ethnicity, evidence suggests that hiring discrimination is experienced only by individuals of Moroccan (non-EU) descent when compared to Belgian applicants, with no observed discrimination for those of Polish (EU) descent. For age, our results indicate that only a substantial age gap of 12 years is penalised in the Brussels labour market. Comparison of coefficients indicates no statistical significance between the effects of a Moroccan ethnic background, a 12-year age gap, and being male. Separate analyses by sector reveal significant discriminatory effects only among the private sector organisations 'Wholesale and retail trade; repair of motor vehicles and motorcycles' (nace G) and 'Administrative and support service activities' (nace N). In the public sector, we observe no significant effects. However, we note that the effects observed for the public sector are qualitatively similar and not significantly distinct from those of the private sectors. A noteworthy exception is a weak but significant difference in hiring discrimination against men which is substantially larger in wholesale and retail sector (nace G) as compared to the public sector (nace O). Last, exploring the intersectionality of ethnicity, age, and gender, we do not find robust evidence that these characteristics substitute (weaken) or complement (strengthen) one another both in the full sample analyses and the analyses for the subsamples by sector.

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1. Introduction

Hiring discrimination remains a pressing issue in contemporary labour markets. Despite the increasing diversity of the workforce worldwide and numerous policy interventions, many individuals from various minority groups, including older individuals and individuals with a foreign ethnicity, still experience significant discrimination in the labour market (Lippens, Vermeiren, et al., 2023; Zschirnt & Ruedin, 2016).[5] Interestingly, while some suggest discrimination against women to reduce over time (Schaerer et al., 2023), most studies indicate there to be limited or no change (increase or decrease) over time in hiring discrimination across various discrimination grounds, including race, ethnicity, nationality, gender, age, religion, disability and sexual orientation (Heath & Di Stasio, 2019; Quillian et al., 2017; Quillian & Lee, 2023).[6] Moreover, while certain meta-analyses indicate that hiring discrimination against minority groups exhibits minimal variation across different regions, encompassing the Americas, Africa, Asia, Europe, and Oceania (Lippens, Vermeiren, et al., 2023), contrasting perspectives posit that discrimination against specific ethnic minority groups may vary significantly at the national level, depending on the particular ethnic group being examined (Thijssen et al., 2022). Concerning age discrimination, older candidates seem to be discriminated against more in Europe than in the United States (Lippens, Vermeiren, et al., 2023). This could be linked to the stricter legal framework surrounding pensions and retirement in European countries. The existence of mandatory retirement ages, in particular, may convey to employers that older individuals are expected to withdraw from the labour market upon reaching a certain age, thereby fostering age discrimination in hiring. Importantly, research by Baert et al. (2016) in Belgium suggests age discrimination largely depends on older candidates' career patterns, with older age only affecting callback robustly if the older candidate was employed in an out-of-field job during their extra post-educational years. For gender, researchers have not yet reached a unanimous conclusion. While most correspondence experiments report null results, the remaining experiments report discrimination against both men and women, with men on average being less likely to be hired (Lippens, Vermeiren, et al., 2023). These results, however, largely depend on various factors, such as the organisation and gender composition of the occupation (Adamovic & Leibbrandt, 2023; Galos & Coppock, 2023; Kline et al., 2022; Lippens, Dalle, et al., 2023). Two recent studies, for example, find the effect of being a man is positive in male-dominated occupations, but negative in female-dominated ones (Adamovic & Leibbrandt, 2023; Galos & Coppock, 2023; Schaerer et al., 2023).[7]

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[5] See Lippens et al. (2023) for a meta-analysis of recent correspondence experiments on discrimination (based on various grounds) in hiring decisions.

[6] Notwithstanding this overarching pattern, Quillian and Lee's (2023) meta-analysis uncovered distinct country-specific and ethnically dependent trends over time in hiring discrimination. The study noted an increase in discrimination against Middle Eastern and North African ethnic groups from the 1990s to the 2000s. France exhibited a decline in discrimination, although from very high to high levels, while the Netherlands experienced an overall increase in discrimination.

[7] Moreover, a comprehensive meta-analysis of field audits investigating gender gaps in application outcomes also reveals a nuanced evolution of discrimination trends over time in male-dominated and female-dominated professions.

Additionally, individuals often combine multiple characteristics (e.g. an older, ethnic minority job applicant), which can lead to supplementary discrimination. However, interactions between multiple factors remain largely under-researched in the field of experimental literature with the exception of gender and ethnicity (Dahl & Krog, 2018). Notwithstanding, for several reasons, we can expect heterogenous effects for ethnicity, age and gender depending on other applicant characteristics. First, when examining the interactions of ethnicity and gender in hiring processes, it can be anticipated that men may face a heightened risk of encountering discrimination. This expectation stems from the disproportionate representation of men in European immigration statistics. In 2021, men constituted 55% of all immigrants and comprised 71% of asylum applicants (Eurostat, 2023a, 2023b, 2023c), in contrast to the general EU27 population, where males make up 49% (Eurostat, 2023a, 2023b, 2023c).[8] For this reason, men with an ethnic minority background may be perceived to be particularly threatening by the majority population. Evidence from labour market field experiments is however mixed. Some research supports the hypothesis (Andriessen et al., 2012; Arai et al., 2016; Dahl & Krog, 2018; Liebkind et al., 2016; Midtbøen, 2016; Van Borm & Baert, 2022), where minority men consistently experience substantially higher levels of discrimination across different types of occupations compared to their minority female peers, while other studies find no or negligible differences in ethnic discrimination based on gender (Blommaert et al., 2014; Bursell, 2014; Derous et al., 2012).

Second, the results are likely to be nuanced for the intersection of ethnicity and age. In line with the previous argument, it is conceivable that younger minority individuals may experience supplementary discrimination, as individuals under the age of 35 are largely overrepresented among asylum applicants (78%) in the EU27 (Eurostat, 2023a). A second argument, in line with the literature on acculturation and age, indicates those who immigrate at younger ages are likely to better acculturate into their new society compared to individuals who immigrate at older ages (Cheung et al., 2011),[9] which could lead to a reduced risk of encountering discrimination for minority individuals who immigrated at a younger age or later generation immigrants compared to their minority peers who immigrated at an older age. Furthermore, in light of the preceding two dynamics regarding ethnicity and age, we anticipate long-established older minority individuals who have i.e. participated in the country's educational and labour market system, will encounter reduced levels of discrimination in comparison to their younger minority peers.

Third, age and gender discrimination may interact. However, the sign of this interaction is difficult to predict (Levy, 1988). On the one hand, we anticipate women to experience heightened discrimination both at younger and older ages. At younger ages, women may experience

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The findings by Schaerer et al. (2023) indicate a decreasing trend in discrimination against women in male-dominated professions, whereas discrimination against men in female-dominated professions appears to remain relatively stable over time.

[8] A similar pattern manifests itself in Belgium (Eurostat, 2023a, 2023b, 2023c).

[9] Cheung et al. (2011) found that a longer duration of exposure is associated with stronger identification with the culture of the immigrant's 'new' country among young immigrants only.

additional discrimination based on their potential or realized fertility. Research suggests this to mainly be an issue in the private sector (Wang & Wong, 2021) and for part-time employment (S. O. Becker et al., 2019). At older ages, employers might prefer hiring men because women more often opt for earlier retirement (OECD, 2015). Results from a large-scale field experiment, suggest that callback rates indeed drop steeper for women than for men (Carlsson & Eriksson, 2019). On the other hand, men may experience heightened discrimination at older ages, as women, on average, have better health than men (OECD, 2013).

Beyond these individual characteristics, hiring discrimination can differ by specific employer aspects. One such aspect is the metropolitan context. In metropolitan cities, such as Brussels and surrounding municipalities, a multitude of disparities emerge including linguistic diversity, ethnic backgrounds and socioeconomic statuses.[10] This diversity presents both opportunities and challenges.

For several reasons, we can expect the effects of discrimination to differ in such a setting. First, exposure to a diverse range of individuals in a metropolitan area may exacerbate discrimination (Beggs et al., 1997; Blalock, 1967; Burr et al., 1991; Frisbie & Neidert, 1977), a phenomenon also referred to as "visibility-discrimination". In densely populated urban environments, people from various backgrounds often interact closely, leading to increased visibility of different demographic groups within society. As a result, individuals may develop discriminatory attitudes in response to perceived socioeconomic threats associated with the increasing presence of minority subgroups. In essence, the visibility of these groups accentuates differences and can exacerbate existing prejudices or stereotypes, thereby intensifying discriminatory behaviour. Second, metropolitan areas may also offer opportunities for reduced discrimination, aligning with the "Contact Theory" (Allport et al., 1954; Paolini et al., 2021; Pettigrew, 2021). This theory suggests that, under certain circumstances, increased exposure to individuals from diverse backgrounds can lead to reduced prejudice and discrimination, primarily because it challenges and breaks down stereotypes. Similarly, in metropolitan areas, organisations are more likely to be owned by a more diverse population. This presence of a diverse group of decision-makers might again benefit minority job seekers, as employers may either consciously or unconsciously seek to hire individuals who share similarities with them or the existing workforce (Sibert, 2014). Notwithstanding, while empirical evidence about discrimination in a metropolitan context is limited, studies mainly suggest a positive correlation between the concentration of ethnic minorities and various indicators of socioeconomic inequality, including hiring discrimination and earnings, providing support for the "visibility-discrimination" thesis (Beggs et al., 1997; Johnson et al., 2012; Mai, 2022; Tomaskovic-Devey & Roscigno, 1996). Some researchers find this to be the case only for certain ethnic groups (Mai, 2022).

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[10] For a more elaborate description of the metropolitan contact in the Brussels Capital Region, we refer to the section 'Institutional setting'.

Another interesting aspect is the (type of) sector in which an organisation operates. Although any discrimination based on any ground such as age, sex, sexual orientation, race, colour, ethnic or social origin, or membership of a national minority is prohibited in Europe (European Union, 2007), multiple factors lead us to believe that the sector and especially the distinction between public and private sectors is of significant interest. In contrast to the private sectors, the government plays a pivotal role in terms of labour market integration, serves as a crucial exemplar, and must remain neutral towards its citizens. Notwithstanding, the experimental literature on this topic is focused only on ethnic discrimination. While some studies indicate employers in the public sector discriminate significantly less compared to those in the private sector (Hou & Coulombe, 2010; Jankowski et al., 2020; Lahey et al., 2023; Wang & Wong, 2021; Wood et al., 2009), others find little to no overall evidence for differences in hiring discrimination between both types of sectors (Cahuc et al., 2019; Jankowski et al., 2020; Leysen et al., 2023; Villadsen & Wulff, 2018).[11] The results, furthermore, suggest research outcomes largely depend on the considered ethnic minority group (Zwysen et al., 2021).

There have been a number of correspondence studies on discrimination in cities in Belgium. Recent experiments carried out in Ghent and Antwerp help shed light on ethnic, age and gender discrimination in hiring practices in Belgian cities (Baert, Dalle, Lippens, & Malfait, 2021; Baert, Dalle, Lippens, Malfait, et al., 2021). In both cities, evidence was found of ethnic discrimination (although only weakly significant in Ghent) and age discrimination in hiring. The latter was driven by applicants who filled in their additional years of life with inactivity. More specifically, in terms of callback rates, the researchers found evidence of a 5.5 percentage point and 5 percentage point difference in positive reactions based on ethnicity, and a 3.8 percentage point and 11.7 percentage point difference by age in Antwerp and Ghent respectively. For gender, which was only alternated between pairs as opposed to within pairs in the experiments, no evidence was found of hiring discrimination.

In this study, we conduct a novel randomised factorial field experiment in the Brussels Capital Region in Belgium (a large metropolitan area), where we simultaneously vary three applicant characteristics (ethnicity, age and gender). In this experiment, we send pairs of fictitious job applications, where the applicants differ only by the tested characteristics, to real job openings in both the public and private sectors. Doing so, we investigate hiring discrimination based on ethnical background, age and gender, including the intersectionality between these characteristics. Interestingly, the method allows us to compare the relative importance of the applicant's characteristics. Last, targeting a broad sample of employers, we also assess heterogeneous effects related to employer characteristics.

2. Institutional setting

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[11] Related, a recent study for Flanders Belgium also found not-for-profit and larger organisations exhibit lower levels of discrimination against candidates from ethnic minority groups when compared to their for-profit counterparts or organisations with smaller workforces.

The Brussels Capital Region is one of the three regions in Belgium. The region is located in the centre of the country and is part of both the Flemish and French communities of Belgium. Consequently, both Dutch and French are official languages in the region.[12] Also, education[13] in Brussels is organised by both the Flemish and French Communities. Hence, students in Brussels have the option to enrol in either Dutch or French study programmes. In the school year 2020-2021, 82% of the secondary education population and 63% of the higher education population were enrolled in French education (BISA.Brussels, 2023b). Of the Brussels population ages 25 and older around 50% obtained a higher education diploma (ISCED 2011 level 5-8) (Statbel, 2023a).

The region comprises 19 municipalities, including the capital (Brussels) of Belgium (Brussels Hoofdstedelijk Gewest, 2023). While the region is geographically relatively small (162 km^2) compared to the other two regions of Belgium,[14] it is by far the most densely populated region with around 7 500 persons per square kilometre (Statbel, 2022e).

The population of Brussels is hyper-diverse, with 36% of the population having a non-Belgian nationality from 183 different countries (BISA.Brussels, 2023a; Statbel, 2022b). Additionally, of those with a non-Belgian nationality, over 55% have a nationality from outside the EU-27 (BISA.Brussels, 2023a; Statbel, 2022b). Of those with a foreign nationality residing in the Brussels Capital Region, 75% are between 18 and 64 years old, compared to 59% of those with a Belgian nationality (Statbel, 2023d). Additionally, 40% of the Brussels population has foreign roots whilst having the Belgian nationality (Statbel, 2022b).[15] Consequently, Brussels stands out as one of the most cosmopolitan cities globally, with sources indicating the city has the second-largest proportion of foreign-born residents among major cities worldwide (International Organization for Migration, 2015). Looking at the gender distribution in the region, men and women each represent about 50% of the Brussels population (Statbel, 2023d).[16] Furthermore, the Brussels Capital Region is characterised by a relatively young population with only 13% of the population being 65 years or older, compared to 21% and 20% in the Flemish and Walloon Region respectively in 2023 (Statbel, 2023c). The vast majority (62%) of Brussels residents fall within the age range of 20 to 64 years, surpassing the respective figures in the Flemish (57%) and Walloon (58%) regions (Statbel, 2023c).[17] In light of this hyper-diverse context, the region is characterised by many initiatives to reduce discrimination, e.g. action plan against racism (2023-2026), for gender mainstreaming(2022-2025), for inclusion of

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[12] The Brussels Capital Region is the only bilingual region in Belgium.
[13] This is a community matter in Belgium.
[14] The Flemish region and Walloon Region cover 13,626 and 16,901 km^2 respectively.
[15] This category comprises individuals who possess a foreign nationality as their first registered nationality, alongside holding the Belgian nationality, or individuals who have at least one parent with a first registered foreign nationality.
[16] While these indicators for the Brussels population reflect the hyper-diverse nature of the Brussels population, it's essential to note that these statistics may not accurately represent the entire workforce in the Brussels Capital Region. This is because more than half (56%) of the jobs in the region are occupied by individuals who reside outside the region (Heylen & De Maesschalck, 2018).
[17] Interestingly, 32% of Brussels residents fall within the age range of 20 to 39 years, exceeding the corresponding percentages in both the Flemish (24%) and Walloon (25%) regions (Statbel, 2023c).

LGBTQIA+ individuals (2022-2025) and for the integration of individuals with a handicap(2022-2025) (https://equal.brussels/).

In addition to the hyper-diverse population, each day many commuters travel to the Brussels Capital Region for work. In 2022 over 400 000 individuals commuted to the Region for work, with nearly half (49.5%) of all jobs being occupied by residents from Flanders or the Walloon Region (Actiris, 2022). This adds an additional layer of opportunities and challenges for the Region, as workers from Flanders and the Walloon Region bring with them a diverse spectrum of perspectives and cultures tied to their region of residence.

Economically, the Brussels Capital Region has the highest number of active VAT-registered organisations per square kilometre in Belgium (Statbel, 2022a, 2022e). The Brussels region, in addition, has an interesting mix of private and public (from all three regions) organisations. Notwithstanding, the Region is confronted with a relatively high unemployment rate compared to the Flemish and Walloon Region in Belgium, respectively 11.5% versus 3.2% and 8.4% in 2022 (Statbel, 2024). Furthermore, while all regions experience higher unemployment rates among individuals with a non-EU nationality of origin, the Brussels Capital Region bears the highest unemployment rate for this demographic (Statbel, 2023b). This trend extends to age demographics as well, with all regions experiencing higher unemployment rates among young individuals (ages 15-24), where again, the Brussels Capital Region exhibits the highest rate (Statbel, 2024). Notably, while the unemployment rates are lower for older age groups (25 to 49 and 50 to 64 years old), also for these groups Brussels reports the highest rates relative to the Flemish and Walloon Regions. Furthermore for men and women, unemployment rates are quite similar within each region (Statbel, 2024).

When examining the proportion of the active population (employed and unemployed) within the total population, slightly different trends emerge. The Brussels Capital Region has an overall activity rate of 68%, placing the region just below the Flemish Region with 74%, and slightly above the Walloon Region, which holds a rate of 66% (Statbel, 2024). Interestingly, while all regions witness lower activity rates among individuals with a non-EU nationality, the gap between Belgian nationals and those of other origins appears smaller in the Brussels Capital Region (Statbel, 2023b). However, within the 15-24 age group, Brussels reports the lowest activity rate at 20% of all regions, compared to 36% in the Flemish Region and 26% in the Walloon Region (Statbel, 2024). For older age brackets, 25 to 49 and 50 to 64 years old, the Brussels Capital Region reports a lower activity rate compared to Flanders but higher compared to the Walloon region (Statbel, 2024). Last, across all three regions, activity rates are consistently higher among men compared to women (Statbel, 2024).

3. Factorial field experiment

To study hiring discrimination in the Brussels labour market, we conduct a randomised factorial field experiment, which builds on both the revealed preferences correspondence experimentation framework of Bertrand and Mullainathan (2004) and the stated preferences factorial experimentation framework of Auspurg and Hinz (2015). Specifically, and in line with

correspondence experiments, we send pairs of fictitious job applications to real job openings where the applicants differ only by the tested characteristics. These characteristics are varied according to the design of factorial experiments, meaning that in our experiment three characteristics with each two levels are simultaneously varied. All other factors are kept constant for all the fictitious applications.

This experimental approach has five distinct advantages. First, by monitoring the responses to fictitious job applications, we can study unequal treatment in the labour market based on these three characteristics, compare the relative rates of hiring discrimination, as well as study the interaction effects among these characteristics. Importantly, any observed effects cannot be due to selection based on unobservable factors, as all information provided is controlled by the researchers (Pager, 2007; Riach & Rich, 2002). The method, therefore, allows for a causal interpretation of the effects related to the investigated candidate characteristics and assures high internal validity of the study. Second, the assessment of hiring discrimination occurs in the real-world context, where employers face tangible consequences of their hiring decisions. The design, therefore, ensures high external validity. Third, in alignment with the second advantage, correspondence experiments directly measure discriminatory behaviour in the labour market, albeit in the initial stages of the hiring process, rather than relying on intentions or attitudes towards candidate characteristics. This allows for the identification of patterns that may be subconscious to the employers in the selection process, thereby enhancing external validity. Fourth, as employers are unaware of the experiment, the study is not affected by social desirability bias, a concern often present in traditional surveys. Last, the method enables us to isolate discriminatory practices by employers from supply-side determinants of labour market outcomes such as diploma and experience (Pager, 2007; Riach & Rich, 2002). Given these advantages, correspondence experiments are often referred to as the "golden standard" to measure discrimination (Heath & Di Stasio, 2019).

3.1. Characteristics

Related to the hyper-diverse population of Brussels, we include three characteristics: **ethnical background, age and gender.** The characteristics and their levels are described below as well as visualised in Table 1.

First, we differentiate between applicants with a Belgian **ethnical background** and those with a foreign ethnic background. Studying the ethnic composition of the Brussels population and the bilingual context, we select both French and Dutch (Flemish) Belgian common names and further divide the foreign ethnicity into European and non-European ethnicities. The latter is operationalized by selecting Polish (EU-27) and Moroccan (non-EU) names, as both job seekers of

Eastern European[18] and of Maghreb[19] origin are more prevalent in figures for very short periods of inactivity (less than six months) and long periods of inactivity (more than twelve months), respectively, compared to job seekers of Belgian origin (view.Brussels, 2019). In addition, those of Maghreb origin represent nearly one-fifth of the working-age population in Brussels (view.Brussels, 2019).

The selected ethnicities are signalled only through the applicants' names for two main reasons. First, (also) signalling the applicants' ethnicity through their nationality might cause employers to avoid foreign applicants in fear of additional paperwork. As this study focuses on the unequal treatment of applicants purely based on their ethnical background, including foreign nationalities could bias our results through perceived administrative costs. Therefore, all applicants have the Belgian nationality and are born in Brussels. While these characteristics imply that we can only study hiring discrimination for a subgroup of second- and later-generation immigrants of Brussels' diverse minority population, research indicates that individuals from ethnic minority backgrounds who are domestically born also experience differential treatment compared to their majority, domestically born, counterparts (Veit & Thijsen, 2021). Second, we could also signal foreign roots whilst having the Belgian nationality through the applicants' language skills. The inclusion of a foreign mother tongue (apart from English), however, is rather unlikely in the Belgian context when the language isn't specifically mentioned in the vacancy.[20] Similarly, the inclusion of other potential ethnic signals such as religion, physical appearance (photo) or types of free time activities, are either unlikely to be included in a CV or could bias our results through perceived credibility, likability, intelligence or flexibility. For similar reasons, gender is only signalled through the applicants' names.

Given that the names are the only aspect signalling ethnicity and **gender**, it is important that the names effectively signal the targeted ethnic origin and gender. To ensure this, we rely on an extensive validation study (the only one in Belgium) in which researchers tested the perception of different (Flemish, Polish, Congolese, Turkish and Moroccan) names among a sample of 990 Belgian individuals (Martiniello & Verhaeghe, 2022).[21] More specifically, we draw the best-matched names from a set of 20 ethnically homogenous names for the Flemish, Polish and Moroccan ethnical groups. The study unfortunately did not cover Walloon (French) names. For these names, we consulted the official statistics on most common names in the Walloon region and selected two top-10 last names (in 2022), as well as one male and one female first name among the 10 most popular first names for girls and boys born in 1995 (Statbel, 2022d, 2022c).[22]

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[18] This includes the following countries: Poland, Hungary, Slovakia, Slovenia, Czech Republic, Bulgaria, Romania, Estonia, Latvia, Lithuania, Cyprus, Malta and Croatia.

[19] This includes the following countries: Morocco, Algeria, Tunisia, Libya and Mauritania.

[20] This was confirmed through informal conversations with both recruiters and individuals with foreign roots.

[21] See also the recent discussion paper of Baert et al. (2022) on for an extended discussion on the importance of name with respect to the validity of experiments in the United States, and the study of Martiniello and Verhaeghe (2023) for more insights into the role of (ethnic) names in discrimination in Belgium.

[22] While the fictitious applicants are born between 1967 and 1985 (see later), the database is only available from 1995 onwards.

Regarding **age**, we vary across ages 38, 44, 50 and 56 which is in line with previous research in Belgium (Baert, Dalle, Lippens, & Malfait, 2021; Baert, Dalle, Lippens, Malfait, et al., 2021). Doing so, we construct the age difference between applicants within a pair of applications to be six or twelve years. The adopted age range is based on two main arguments. First, for (female) candidates under 38, it is hard to disentangle gender-based and fertility-based discrimination (S. O. Becker et al., 2019; Wang & Wong, 2021). Second, employers may receive additional subsidies for hiring older candidates (ages 57-65) (Rijksdienst voor Sociale Zekerheid, 2023a), potentially leading to an underestimation of age-based discrimination.

We further ensure that the candidates only differ in age and not on relevant experience by assigning the older applicant additional irrelevant experience on their CV.[23] Assigning the older candidate additional relevant experience or a period of inactivity could result in unequal (perceived) qualifications between candidates. The irrelevant experiences are identified using the ISCO codes of the different jobs as registered on the website of the Public Employment Agency of Flanders (one of the main job search channels in Belgium) (VDAB, 2023). Irrelevant experiences are those experiences which have as little matching ISCO codes as possible with the relevant experience.

Table 1. Characteristics and corresponding levels

Characteristics	Number of main levels	Main levels	Sublevels (if present)
Ethnical background	2	1. Belgian	/
		2. Foreign	2.1. Polish 2.2. Moroccan
Age	2	1. Young	1.1. 38 years old 1.2. 44 years old
		2. Old	2.1. 'Young' + 6 years 2.2. 'Young' + 12 years
Gender	2	1. Male	/
		2. Female	/

The selected characteristics and their levels (Table 1) result in eight possible combinations (i.e. 2×2×2; the factorial product of all main levels). These eight combinations are then divided into four groups (sets) of two fictitious applicants using the SAS macro %mktblock[24] (Table 2). Taking into account all sublevels of the three characteristics, the design in Table 2 is repeated eight times (Appendix Table A1). The sets were randomly assigned to the participants. Furthermore, to prevent order effects, the two fictitious applicants are sent in an alternating order to the recruiters. This design has the maximum possible efficiency (D-efficiency 100), meaning that all characteristics and their two-way interactions are orthogonal and all main levels are balanced (Auspurg & Hinz, 2015),

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[23] The older applicants are assigned irrelevant experience for a period equal to the age difference (6 or 12 years) with the younger person applying to the same vacancy. Doing so, we make sure both the younger and older candidates have relevant experience immediately after graduation as well as before embarking on the new journey, with the older candidate having irrelevant experience in between both relevant experiences.

[24] This macro facilitates the allocation of the design to different sets, while aiming to achieve maximum orthogonality and level balance within each individual set.

which allows us to identify the causal effects of the parameters of interest. Post-experiment correlations indeed confirm the factors exhibit a high degree of orthogonality, implying that these factors are essentially uncorrelated (Appendix Table A2). Additionally, (post-experiment) descriptive statistics affirm that the levels within each factor are nearly balanced (Table 3).[25]

Table 2. Design: factorial field experiment

Set	Applicant 1			Applicant 2		
	Ethnic background	Age	Gender	Ethnic background	Age	Gender
1	Belgian	Young	Male	Foreign	Old	Female
2	Belgian	Young	Female	Foreign	Old	Male
3	Belgian	Old	Male	Foreign	Young	Female
4	Belgian	Old	Female	Foreign	Young	Male

3.2. Resume pair templates

Along with the characteristics altered within the experiment, we also add additional attributes to the CVs to make them believable. First, regarding personal information, all fictitious applicants live in Brussels as signalled through a fictitious postal address (an existing street name in a middle-class neighbourhood, but a non-existing house number was indicated) and mention their telephone number and email address (from major providers) as well as having the Belgian nationality. Also, none of the applicants disclosed their relationship status. Second, regarding skills and competencies, each candidate mentions a relevant educational degree, comparable language (Dutch, French, and English) and computer skills. Third, all applicants report similar relevant experiences at two fictitious companies (an existing, but general and widely used (part of a) company name or abbreviation was indicated).[26,27] Fourth, all applicants indicate having a driving licence and participating in a team sport. Fifth, the motivation letters mentioned that the job applicant (i) had found the vacancy online (mentioning the website), (ii) was looking forward to or would like to further discuss their application in a job interview and (iii) mentioned the applicants' name (and thus ethnic background and gender).[28]

Last, to avoid detection of the experiment, we created two CV and motivation letter templates, Type A and Type B (example in Appendix B). Both templates are equivalent concerning all crucial characteristics but include a variety of common terminology, as well as have a different layout. In addition, each template was assigned a specific postal address, educational institution, hobby and list of fictitious companies. While this background information and the template layout are highly comparable between both templates, we assigned the templates in alternating order to the two

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[25] Also, with respect to the interactions, we also find exceptional post-experiment level balances (Appendix Table A3).

[26] This way employers cannot identify one specific company, and thus cannot (1) evaluate the candidate based on the (good or bad) corporate reputation and (2) burden the (fictitious) previous employers with questions about a job applicant.

[27] The familiarity of the company names was checked through the database of Bel-first (Bureau Van Dijk, 2023).

[28] The applicants' age was not signalled in the motivation letter.

applicants within each pair. The layout and the background information can therefore not impact our results. For the technical aspects and considerations when conducting a correspondence experiment, we refer to the study of Lahey and Beasley (2018).

3.3. Data collection

Between April 2023 and February 2024, 432 pairs of applications (equalling 864 individual applications) were sent out to vacancies for jobs (with the place of work) in the Brussels Capital Region.[29] These vacancies were all issued by companies with nace codes in either the private sectors of 'Wholesale and retail trade; repair of motor vehicles and motorcycles' (nace G) and 'Administrative and support service activities' (nace N), or the public sector 'Public administration and defence; compulsory social security' (nace O).[30] These three sectors were selected due to their significant contribution to overall employment in the Brussels Capital Region, encompassing both public and private sectors. In 2022, the wholesale and retail sector (nace G), the administrative and support service activities (nace N) and the public sector (nace O) represented respectively 8.2%, 10.5% and 16.5% of all employees working in the Brussels Capital Region (place of work) (Rijksdienst voor Sociale Zekerheid, 2022).[31] Focussing on these sectors allows us to study (potential differences in) discriminatory hiring practices in the public and private sectors. Within these sectors, we selected the 46 most requested jobs in Brussels (as defined by the Flemish Public Employment Agency) to which we could apply (overview of all jobs in Appendix Table A4).

Vacancies were drawn from the major job search channels in Belgium, namely public employment services of Flanders (VDAB), the Walloon Region (Le FOREM), the Brussels Capital Region (Actiris) and the German Community (ADG). These websites were supplemented by other sources, such as homepages of public organisations.[32]

Moreover, we filtered out vacancies for junior jobs where no or very limited (5 years or less) experience was required, as all fictitious applicants in our experiment are 38 years old or over. Last, we applied to no more than one vacancy from each employer in the private sector and two vacancies from each employer in the public sector,[33] to limit the burden on the employers and to

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[29] This implies that the place of employment as mentioned in the vacancy is situated in the Brussels Capital Region, regardless of the location of the organisation's headquarter.

[30] The organisation's sector is checked through the database of the Crossroads Bank for Enterprises (CBE, 2023). Organisations are categorized into sectors based on their primary nace code for the NSSO activities 2008. If their primary activity falls outside the three predefined sectors, we allocate them to the sector corresponding to their secondary activity. 101 organisations are subject to this criterion. Furthermore, within our sample, eight organisations have a primary code that does not correspond with the predefined sectors and are involved in activities spanning two of these sectors. In such cases, we assign them to the sector deemed most relevant.

[31] Notably, the education sector (NACE P) also emerged as a substantial contributor to Brussels employment, mirroring a comparable share of 11.08% of all employees within the region (Rijksdienst voor Sociale Zekerheid, 2022). However, this sector is not included in this experiment, largely due to job vacancies often requiring documentation such as diplomas and a statement of convictions during the initial application phase.

[32] Though the homepages often referred back to the website of a public employment service, this approach did lead to some additional observations (especially for the public sector).

[33] For a discussion on the differing number of vacancies per organisation depending on the type of sector, we refer to Appendix C.

further minimize the chances of the experiment being discovered. The applications were sent via email or through online tools, with 12 to 24 hours in between submissions.

3.4. Outcome variables

For each selected vacancy, we monitor all responses from the employer via telephone voicemail and email.[34] Doing so, we differentiate between four response types, namely (1) an invitation to a job interview,[35] (2) any other positive reaction (e.g. a request for further information or to be contacted, an alternative job offer), (3) a rejection and (4) no reaction within 30 days after applying.[36] Importantly, to minimise the cost to employers, we emailed them as soon as possible after receiving a positive response (types 1 or 2) notifying them of the applicant's voluntary withdrawal from the selection process.[37]

For the analyses, we recode these responses into two dummy variables ('interview invitation' and 'any positive reaction') equal to one if the candidate received a positive response in the strict sense (job interview - response type 1) or broad sense (any positive reaction - response type 1 and 2), and zero otherwise.

3.5. Limitations of the experimental design

We end this section with a discussion of the limitations of correspondence experiments. While these experiments allow researchers to examine causal effects on labour market success, they are surrounded by some concerns regarding generalisability. This is linked to two main factors.

First, we only observe the initial hiring decisions of employers outside the candidates' networks and therefore cannot make any claims about wages and long-term labour market outcomes. While this is an important general weakness of correspondence experiments, the initial employer response (first job interview) crucially impacts the chances of being hired (Cédiey et al., 2008). Moreover, should we identify a bias favouring certain applicants, the absence of information beyond the callback is a concern only if, conditional on the callback, the probability of hiring changes based on the investigated characteristics of the applicant (Baert, Neyt, et al., 2021). Furthermore, to accommodate concerns of generalisability, we examine both general callback and strict callback (invitations for a job interview), where the latter serves as the strongest signal of employers' preferences (Deming et al., 2016). Audit studies, where actors partake in job interviews, could overcome this limitation and provide causal measures on labour market outcomes. However, audit tests are costly and have drawn criticism on various grounds, including concerns about efficacy and resource consumption (Heckman & Siegelman, 1993; Riach & Rich, 2002). Notwithstanding, the

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[34] Additionally, these responses did not suggest any discovery of the experiment.

[35] This specifically concerns an invitation to an interview for the job mentioned in vacancy.

[36] All reactions, also exceptional positive ones, beyond 30 days after applying are censored and assumed to be negative.

[37] For a deeper exploration of the ethical dimensions surrounding the correspondence experiments, we refer to Riach and Rich (2004).

meta-study of Quillian et al. (2020) which includes those studies that investigate actual job offers (beyond callback), suggests that any observed effect for the initial outcome likely is amplified at later stages in the hiring process, with considerable additional observed discrimination of minority applicants in hiring after the callback.

Second, it is important to recognize that our findings only apply to the specific factors and levels included in our experiment, as well as the context to which are experiment applies. Consequently, these results cannot be extrapolated to encompass the entire population at large. More specifically, while we include various levels for the factors of ethnicity and age, these levels do not represent all ethnic minorities and age groups in the Brussels Capital Region. Furthermore, though we include a broad set of study programmes within fields of study in both secondary and higher education in the Brussels Capital Region, full representation of all fields of study cannot be achieved. Also, individuals who studied and/or reside outside the Brussels Capital Region are not represented in this study. More specifically, we only focus on applicants living in the Brussels Capital Region with a technical or vocational secondary education or a bachelor's degree obtained in the region and only apply for vacancies in the region.

Third, conducting correspondence experiments for positions and in sectors that demand documentation such as diplomas, licenses, or citizenship during the initial application phase poses significant challenges. Usually, such documentation is unavailable for these experiments due to ethical considerations and, notably, the legal prohibition against fabricating evidence. Consequently, vacancies requiring such credentials are omitted from our study, as fictional applicants are unable to apply or would be rejected due to insufficient documentation in their applications. Within our experiment, the barrier of access predominantly arises in vacancies within the public sector, where frequently a national registration number and/or further evidence of diplomas and licenses are required.

Despite these shortcomings, balancing the inherent generalisability problem inherent to the experimental framework and the benefit of obtaining causal estimates for labour market success, correspondence experiments remain the most prominent and favoured method for investigating this labour market discrimination. This is demonstrated through the ever-increasing occurrence of correspondence experiments in academic literature (see updated register of correspondence experiments on hiring discrimination of Baert, 2018).

4. Results

4.1. Data description

In this section, we provide descriptive statistics (mean values) for (i) treatment variables, (ii) other applicant characteristics, (iii) vacancy and organisation characteristics, and (iv) outcome measures (Table 3). The mean values for the treatment variables (ethnicity, age and gender) confirm that our experiment randomisation effectively worked, with all levels within each factor being balanced, both in our full sample and the various subsamples by sector.

Additionally, when considering the applicants' educational background and the specific characteristics of the vacancies and organisations, the sample showcases a diverse cross-section.[38] In terms of educational qualifications, 63% of the fictitious applicants hold a bachelor's degree, while 37% possess a vocational or technical secondary education degree. Furthermore, an analysis of the vacancies included in the experiment reveals that 86% of them were posted by private organisations,[39] with the majority falling under administrative and support service activities (nace N), while 14% were from the public sector. Consistent with the prevalence of small and medium enterprises (SMEs) in Belgium, nearly 80% (the sum of 61.3% and 18.2% in Table 3) of the organisations in our sample have 250 employees or less.[40] Moreover, considering the nature of contracts and work schedules, the sample has a high proportion of indefinite-duration contracts and full-time work schedules.

Studying the employers' response, we find that in our experiment of all applicants, 14% received an invitation to a job interview (response in the strict sense), 36% received a positive response (response in the broad sense, including an interview invite and a request for further information), and 9% were formally rejected. The remaining 55% of applicants did not receive any reaction to their application within 30 days after applying. These callback rates (in strict and broad sense) are in line with, or slightly higher compared to, earlier correspondence experiments in Belgium on ethnicity, age and gender (Baert, Dalle, Lippens, & Malfait, 2021; Baert, Dalle, Lippens, Malfait, et al., 2021; Baert et al., 2016; Baert & Vujić, 2016).

Exploring the descriptive statistics across the public and private (nace G and N) sectors similar trends emerge. For all four subsamples (Table 3, columns 2, 3, 3a and 3b), there is a commendable balance across all levels within each experimental factor. Notwithstanding, there are noteworthy differences between the sectors. First, fictitious applicants more frequently hold bachelor's degrees when applying to the public sector compared to the private sector, respectively 92% versus 58%. The private sector wholesale and retail trade (nace G), especially, reports a relatively low share of fictitious applicants holding a bachelor's degree (43%). Second, there is a linguistic contrast, with a majority of applicants using Dutch in the public sector (60%) and French in the private sector wholesale and retail trade (nace G) (72%). In the private sector administrative and support service activities (nace N), the fictitious applicants almost equally often applied in Dutch (54%) and French (47%). Third, public organisations tend to be larger on average than their private counterparts. Last, public sector organisations demonstrate a higher share of applicants invited for a job interview, with 23% of applicants receiving invitations compared to 13% in the private sector. Additionally, public employers tend to send more formal rejections, with 17% and 8% of applicants in the public and

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[38] Please note that these characteristics are beyond our control within the experiment and instead depend on the available relevant vacancies.

[39] When utilizing the terms 'private sector' or 'private organisations' we are referring to the outcomes derived from the combined sectors 'Wholesale and retail trade; repair of motor vehicles and motorcycles' (nace G) and 'Administrative and support service activities' (nace N).

[40] These statistics are derived from a subsample that excludes observations where the company size was unknown, (Table 3 column 1b).

private sectors respectively receiving formal decline notifications via email or voicemail. The wholesale and retail sector (nace G) has the highest share of non-response, with 65% of the candidates not receiving any response within 30 days after applying compared to 48% in the public sector (nace O) and 46% in administrative and support service activities (nace N).

Table 3. Descriptive statistics

Variable			Description	Mean					
				Full sample	Full sample, excluding category 'unknown'	Public sector, nace O	Private sector, nace G and N	Private sector, nace G	Private sector, nace N
				(1a)	(1b)	(2)	(3)	(3a)	(3b)
Treatment variables									
Ethnical background									
• Belgian			1 if the candidate reveals a Belgian-sounding name in their application, 0 otherwise	.500		.500	.500	.500	.500
• Foreign	Total		1 if the candidate reveals a foreign-sounding name in their application, 0 otherwise	.500		.500	.500	.500	.500
	Polish		1 if the candidate reveals a Polish-sounding name in their application, 0 otherwise	.250		.250	.250	.233	.268
	Moroccan		1 if the candidate reveals a Moroccan-sounding name in their application, 0 otherwise	.250		.250	.250	.267	.232
Age									
• Young	Total		1 if the candidate is the younger applicant of the pair of applicants, 0 otherwise	.500		.500	.500	.500	.500
	38 years old		1 if the candidate is the younger applicant of the pair of applicants and 38 years old, 0 otherwise	.259		.225	.265	.267	.262
	44 years old		1 if the candidate is the younger applicant of the pair of applicants and 44 years old, 0 otherwise	.241		.275	.235	.233	.238
• Old	Total		1 if the candidate is the older applicant of the pair of applicants, 0 otherwise	.500		.500	.500	.500	.500
	'Young' + 6 years		1 if the candidate is the older applicant of the pair of applicants and 6 years older than the younger applicant, 0 otherwise	.250		.292	.243	.227	.259
	'Young' + 12 years		1 if the candidate is the older applicant of the pair of applicants and 12 years older than the younger applicant, 0 otherwise	.250		.208	.257	.273	.241
Gender									
• Male			1 if the candidate is male, 0 otherwise	.500		.500	.500	.500	.500
• Female			1 if the candidate is female, 0 otherwise	.500		.500	.500	.500	.500
Other applicant characteristics									
Diploma	Secondary education		1 if the candidate holds a vocational or technical secondary education degree, 0 otherwise	.370		.083	.417	.567	.265
	Tertiary education		1 if the candidate holds a bachelor's degree, 0 otherwise	.630		.917	.583	.433	.735
Language of the application	Dutch		1 if the candidate applied in Dutch, 0 otherwise	.433		.600	.406	.278	.535
	French		1 if the candidate applied in French, 0 otherwise	.567		.400	.594	.722	.465
Vacancy and organisation characteristics									
Sector									
• Public	Total - Public administration and defence; compulsory social security (Nace O)		1 if the organisation has a 'nace code for the NSSO£ activities 2008' in the public sector, 0 otherwise	.139		1.000	.000	.000	.000
• Private	Total		1 if the organisation has a 'nace code for the NSSO£ activities 2008' in the private sector, 0 otherwise	.861		.000	1.000	1.000	1.000
	Wholesale and retail trade; repair of motor vehicles and motorcycles (Nace G)		1 if the organisation has a 'nace code for the NSSO£ activities 2008' in the private sector Nace G, 0 otherwise	.461		.000	.503	1.000	.000
	Administrative and support service activities (Nace N)		1 if the organisation has a 'nace code for the NSSO£ activities 2008' in the private sector Nace N, 0 otherwise	.447		.000	.497	.000	1.000

(Table 3 continued)

Category	Subcategory	Description						
Company size	Small	1 if the organisation has 50 employees or less, 0 otherwise	.569	.613	.183	.632	.754	.508
	Medium	1 if the organisation has between 51 and 250 employees, 0 otherwise	.169	.182	.300	.148	.118	.178
	Large	1 if the organisation has more than 250 employees, 0 otherwise	.190	.204	.500	.140	.080	.200
	Unknown	1 if the number of employees is unknown, 0 otherwise	.072		.017	.081	.048	.114
Contract duration	Indefinite contract	1 if the vacancy mentions an indefinite (open-ended) contract, 0 otherwise	.563	.698	.550	.565	.492	.638
	Temporary contract	1 if the vacancy mentions a temporary contract, 0 otherwise	.243	.302	.350	.226	.219	.232
	Unknown	1 if the contract duration is unknown, 0 otherwise	.194		.100	.210	.289	.130
Work schedule	Fulltime	1 if the work schedule is fulltime, 0 otherwise	.833	.853	.917	.820	.759	.881
	Part-time	1 if the work schedule is part-time, 0 otherwise	.144	.147	.067	.156	.209	.103
	Unknown	1 if the work schedule is unknown, 0 otherwise	.023		.017	.024	.032	.016
Outcome								
Interview invitation (strict sense)		1 if the candidate receives an interview invitation, 0 otherwise	.140		.233	.125	.115	.135
(Any) positive response (broad sense)		1 if the candidate receives any positive reaction, 0 otherwise	.363		.358	.364	.262	.468
Decline		1 if the candidate receives a negative response, 0 otherwise	.091		.167	.079	.088	.070
No response		1 if the candidate receives no response within 30 days after applying, 0 otherwise	.545		.475	.556	.650	.462
The number of observations (job applications)			864		120	744	374	370

Note. Standard deviations are not reported as all variables are binary. The data presented in this table is unweighted. Column 1b reports the mean values for a subsample that excludes observations where the respective variable (company size, contract duration or work schedule) was unknown. Company size is derived from the number of employees at the company as registered in Bel-first (Bureau Van Dijk, 2023), supplemented with Trends Top (Roularta Media Group, 2024). The definition of company size is based on the European definition of small and medium enterprises (European Commission, 2003). £ NSSO stands for 'National Social Security Office'.

4.2. Bivariate analyses

In this section, we describe the bivariate results, where we report the number of tested vacancies and the callback rates per experimental characteristic (Table 4). Overall, we find the callback rate to be higher for Belgian applicants, younger applicants and female applicants compared to their ethnic minority, older and male peers. For ethnicity and age, this difference is observed mainly when studying the response in the broad sense (any positive reaction). However, it is important to note that while our results suggest potential biases against foreign ethnicity and older age groups in employer responses, the differences in callback rates are only weakly significant (at the 5% and 10% level) when relying on the McNemar statistics.[41]

For gender, in contrast, we observe a significant preference for women both in the strict and broad sense. Overall, we find that female applicants get an invitation to a job interview in 16.2% of their applications, in contrast to 11.8% for their male peers. Female applicants thus have a 4.4 percentage points higher invitation probability. The ratio of the invitation rates is 1.373, indicating that female applicants get as much as 37.3% more invitations than their male counterparts for a given number of applications.

The bivariate analyses for the private and public sectors, confirm that the overall results are mainly driven by organisations operating in the private sector (as they make up the majority of our sample). Delving into the specific private sectors, we only observe significant hiring discrimination against men in the wholesale and retail sector (nace G), with women on average receiving more positive responses as well as more interview requests. In the administrative and support service activities (nace N), on the other hand, we only observe a significant difference in callback (albeit only at the 10% significance level) in the broad sense for ethnicity with applicants with a foreign sounding name receiving fewer positive reactions as compared to their peers with a Belgian sounding name. In the public sector, the differences in callback rates are all insignificant. This is likely linked to the low number of observations. Notwithstanding, also for the public sector, results seem to point towards similar trends with the callback rate being higher for Belgian applicants, younger applicants and female applicants compared to their ethnic minority, older and male peers.

Last, it is essential to note that while bivariate results allow us to assess whether we observe unequal treatment between the applicants of Belgian and foreign ethnicity, younger and older applicants, and men and women, the bivariate analyses are less suited for the analysis of more detailed sublevels of these applicant characteristics, e.g. do callback rates differ depending on the specific foreign ethnic group or magnitude of the age gap. Additionally, the analyses do not allow us to compare the relative importance of the applicant's characteristics or to assess whether the outcomes are significantly different across subsamples (private versus public sectors). Therefore, in

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[41] While the significance levels vary somewhat depending on the test used (t-test or McNemar test), results overall point towards the same conclusion.

the next section, we estimate multivariate regressions with the individual application as the observation unit and the employer response as the outcome variable.

Table 4. Bivariate analyses of the positive responses in strict and broad sense

Applicant characteristic		N	Interview invitation						Any positive response					
			Callback group 1	Callback group 2	Ratio	Difference in callback	T-value	McNemar's χ^2 value	Callback group 1	Callback group 2	Ratio	Difference in callback	T-value	McNemar's χ^2 value
Full sample														
Ethnicity	Group 1 Belgian, Group 2 Foreign£	432	.155	.125	1.241	.030 (.024)	1.274	3.45*	.387	.340	1.136	.046 (.033)	1.415	4.35**
Age	Group 1 Young, Group 2 Old$	432	.139	.141	.984	-.002 (.024)	-.098	.02	.384	.343	1.122	.042 (.033)	1.273	3.52*
Gender	Group 1 Female, Group 2 Male	432	.162	.118	1.373	.044 (.024)	1.864*	7.37***	.394	.333	1.181	.060 (.033)	1.841*	7.35***
Public sector, nace O														
Ethnicity	Group 1 Belgian, Group 2 Foreign£	60	.250	.217	1.154	.033 (.078)	.428	.40	.367	.350	1.048	.017 (.088)	.189	.07
Age	Group 1 Young, Group 2 Old$	60	.250	.217	1.154	.033 (.078)	.428	.40	.383	.333	1.150	.050 (.088)	.567	.60
Gender	Group 1 Female, Group 2 Male	60	.250	.217	1.154	.033 (.078)	.428	.40	.350	.367	.955	-.017 (.088)	-.189	.07
Private sectors (nace G and N)														
Ethnicity	Group 1 Belgian, Group 2 Foreign£	372	.140	.110	1.268	.030 (.024)	1.219	3.10	.390	.339	1.151	.051 (.035)	1.448	4.69**
Age	Group 1 Young, Group 2 Old$	372	.121	.129	.937	-.008 (.024)	-.332	.23	.384	.344	1.117	.040 (.035)	1.142	2.92
Gender	Group 1 Female, Group 2 Male	372	.148	.102	1.447	.046 (.024)	1.887*	7.41***	.401	.328	1.221	.073 (.035)	2.060**	9.47***
Private sector, wholesale and retail trade (nace G)														
Ethnicity	Group 1 Belgian, Group 2 Foreign£	187	.139	.091	1.529	.048 (.033)	1.459	3.24	.283	.241	1.178	.043 (.046)	.939	1.52
Age	Group 1 Young, Group 2 Old$	187	.102	.128	.792	-.027 (.033)	-0.809	1.00	.278	.246	1.130	.032 (.046)	.704	.86
Gender	Group 1 Female, Group 2 Male	187	.144	.086	1.687	.059 (.033)	1.786*	4.84**	.316	.209	1.513	.107 (.045)	2.363**	9.52***
Private sector, administrative and support service activities (nace N)														
Ethnicity	Group 1 Belgian, Group 2 Foreign£	185	.141	.130	1.083	.011 (.036)	.303	.29	.497	.438	1.136	.059 (.052)	1.145	3.46*
Age	Group 1 Young, Group 2 Old$	185	.141	.130	1.083	.011 (.036)	.303	.29	.492	.443	1.110	.049 (.052)	.936	2.31
Gender	Group 1 Female, Group 2 Male	185	.151	.119	1.273	.032 (.036)	.911	2.57	.486	.449	1.084	.038 (.052)	.728	1.40

Note. N equals the number of vacancies. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Significance levels for McNemar's Chi2 test are based on the exact McNemar significance probability. Standard errors are in parentheses. The data presented in this table is unweighted. £ indicates the candidate has a foreign (Moroccan or Polish) sounding name. $ indicated the applicant is 6 or 12 years older than the younger applicant. In Appendix Table A5, we provide an overview of the number of negative and positive responses by group.

4.3. Multivariate analyses

In this section, we run a linear probability model with the individual application as the observation unit and the employer response as the outcome variable.[42] Doing so, we study both the interview invitations (1 if the candidate receives an interview invitation, 0 otherwise) and the dummy for any positive response (1 if the candidate receives any positive reaction, 0 otherwise). For all analyses, we cluster the standard errors at the organisation level.[43]

First, we estimate a model (Model a, Table 5) including only the main candidate characteristics. The results of this analysis confirm our findings of the bivariate analysis.[44] Specifically, we observe a positive effect of being female for both the strict and broad employer responses, with women having a 4.4 percentage points higher probability of getting an interview request and a 6.0 percentage points higher probability of getting a positive reaction compared to men. For ethnicity and age, the effects are less evident. While there is no real impact on the strict outcome (interview invitations), our analysis of the response in broad sense reveals that both older applicants and those with names suggesting a foreign origin experience a significantly (at the 5% and 10% level) lower probability (respectively -4.2 percentage points and -4.6 percentage points) of receiving a positive response compared to their younger counterparts and those of Belgian descent.

Second, we estimate a linear probability model (Model b, Table 5) including the more detailed candidate characteristics for ethnicity and age. Interestingly, we find the effect for both ethnicity and age to be driven by one of their sublevels. Specifically, we find applicants with a Moroccan ethnic background to have a significantly lower probability of getting an interview request (-5.8 percentage points) and a positive response (-9.5 percentage points) compared to those of Belgian descent. For age, the negative effect is largely driven by applicants who are 12 years older than their younger peers (50 versus 38 years old and 56 versus 44 years old). We find applicants over 50 years old to have a significantly lower probability of getting an interview request (-5.1 percentage points) as well as any positive response (-9.3 percentage points) compared to younger applicants. For 6 years older applicants, the analysis in the strict sense (Model 1b) seems to suggest a positive effect of being 6 years older, this effect does not persist in the broad-sense analyses. The observation could be linked to employers valuing additional, yet irrelevant, experience over an age gap of 6 years.

Next, it is noteworthy that (for both models a and b) the impact of (Moroccan) ethnicity, (12-year older) age and male gender on hiring chances appears to be more pronounced when considering responses in a broad sense as compared to the strict sense. However, additional analyses indicate

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[42] Results, reported in Appendix Table A6, based on logistic regression models yield similar results.

[43] Additional analyses, reported in Appendix Table A7, with standard errors clustered at the vacancy level yield almost identical results.

[44] Note that, given the D-efficient design of our experiment where all three applicant characteristics are orthogonal and all main levels are balanced, the reported percentage point differences for Model a in Table 5 are equal to the difference in callback rates as reported in Table 4.

the coefficients not to be statistically different from one another, and therefore we cannot rule out the effects are similar. Interestingly, comparing the coefficients for ethnicity, age and gender, we find the effects of a Moroccan ethnic background, a 12-year age gap and being male, not to be statistically significant from one another.

Table 5. Linear probability models of employer response

			Interview invitation; strict sense		(Any) positive response; broad sense		χ² statistic	
			(1a)	(1b)	(2a)	(2b)	(1a)=(2a)	(1b)=(2b)
Ethnicity (ref. Belgian)	Foreign	(e)	-.030* (.016)		-.046** (.022)		.72	
	Polish			-.002 (.024)		.002 (.032)		.03
	Moroccan	(e_m)		-.058*** (.022)		-.095*** (.031)		1.81
Age (ref. young)	Old (6-12 years older)	(a)	.002 (.016)		-.042* (.022)		5.32**	
	Old – 6 years older			.056** (.024)		.009 (.032)		2.75*
	Old – 12 years older	(a_12)		-.051** (.023)		-.093*** (.032)		2.43
Gender (ref. female)	Male	(g)	-.044*** (.016)	-.044*** (.016)	-.060*** (.022)	-.060*** (.022)	.72	.72
Constant			.176*** (.022)	.176*** (.022)	.438*** (.028)	.437*** (.028)		
F-statistic	(e)=(a)		1.97		.02			
	(e)=(g)		.43		.22			
	(a)=(g)		4.21**		.32			
	(e_m)= (a_12)			.05		.00		
	(e_m)=(g)			.28		.88		
	(a_12)=(g)			.05		.64		

Note. Number of observations (job applications) is 864. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. Number of clusters (organisations) is 414. The data presented in this table is unweighted.

Table 6 examines disparities in hiring discrimination across different sectors. Much like the bivariate analyses, we find significant discriminatory effects only among the private sector organisations (both nace G and N). Notwithstanding, the analyses for the more detailed levels of ethnicity and age surface additional insights. In both the wholesale and retail sector (nace G) and the administrative and support service activities (nace N), we observe adverse effects of having a Moroccan ethnicity as compared to a Belgian ethnicity, with no significant effect of a Polish ethnicity and a negative effect of being over 50 years old with no (negative) effect for older workers under 50. In both sectors, women appear to have an advantage with respect to their initial labour market chances.

In the public sector, we observe no significant effects, likely due to the limited sample size for the sector. However, we note that the discriminatory effects observed for the public sector are qualitatively similar to those of the private sector, except for the absence of hiring discrimination against men in any positive reaction. Further examination reveals that the observed effects in both public and private sectors are not significantly distinct from each other, with the exception of a weak but significant difference in hiring discrimination against men which is substantially larger in wholesale and retail sector (nace G) as compared to the public sector (nace O).

Table 6. Linear probability models of employer response; detailed effects by sector

			Public sector	Private sector, nace G and N	Private sector, nace G	Private sector, nace N	χ^2 statistic			
			(1)	(2)	(2a)	(2b)	(1)=(2)	(1)=(2a)	(1)=(2b)	(2a)=(2b)
Interview invitation; strict sense										
Ethnicity (ref. Belgian)	Polish		-.027 (.083)	.000 (.025)	-.027 (.037)	.024 (.033)	.11	.00	.35	1.06
	Moroccan	*(e_m)*	-.040 (.069)	-.061*** (.023)	-.070** (.032)	-.049 (.032)	.09	.16	.01	.21
Age (ref. young)	Old – 6 years older		-.002 (.068)	.063** (.026)	.070* (.038)	.053 (.035)	.83	.88	.54	.11
	Old – 12 years older	*(a_12)*	-.095 (.089)	-.043* (.023)	-.018 (.035)	-.071** (.030)	.34	.70	.07	1.37
Gender (ref. female)	Male	*(g)*	-.037 (.053)	-.047*** (.017)	-.058** (.027)	-.035* (.020)	.03	.14	.00	.51
Constant			.289*** (.080)	.159*** (.023)	.158*** (.034)	.161*** (.031)	2.56	2.39	2.33	.00
(Any) positive response; broad sense										
Ethnicity (ref. Belgian)	Polish		.025 (.100)	-.001 (.034)	.001 (.050)	-.019 (.046)	.06	.05	.17	.08
	Moroccan	*(e_m)*	-.067 (.085)	-.102*** (.034)	-.090** (.044)	-.100* (.051)	.15	.06	.12	.02
Age (ref. young)	Old – 6 years older		-.039 (.076)	.021 (.035)	.031 (.048)	-.004 (.050)	.54	.63	.16	.25
	Old – 12 years older	*(a_12)*	-.048 (.111)	-.097*** (.033)	-.099** (.045)	-.082* (.048)	.19	.19	.08	.06
Gender (ref. female)	Male	*(g)*	.013 (.066)	-.073*** (.023)	-.107*** (.034)	-.036 (.032)	1.59	2.77*	.47	2.35
Constant			.384*** (.081)	.446*** (.030)	.359*** (.044)	.535*** (.042)	.55	.07	2.92*	8.58***
Number of observations (job applications)			120	744	374	370				
Number of clusters (organisations)			46	368	185	183				

Note. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. The data presented in this table is unweighted. In Appendix Table A8, we provide an overview of the linear probability models of employer response; main effects by sector.

Next, we concentrate on assessing callback variations within distinct subgroups based on applicants' ethnicity, gender, and age (Table 7). Doing so, we include interaction effects between the main candidate characteristics (foreign ethnicity, older and male). As a robustness check, we also compare regression results for all subsamples regarding ethnicity, age and gender (Appendix Table A9). Overall, we do not find any strong interaction effects. However, it's worth noting that the results hint at interaction effects for certain outcomes, albeit weakly. For the response in the strict sense, we observe a weak interaction-effect between ethnicity and gender (significance at the 10%-level) indicating the negative effect of a foreign ethnicity to be smaller (potentially fully mitigated) for men. Further analyses for all subsamples, however, indicated this to be true only when comparing those of Polish descent to applicants of Belgian ethnicity (Appendix Table A9). For the response in the broad sense, we find a weak interaction-effect between ethnicity and age (at the 10% significance level), which indicates the negative effect of a foreign ethnicity to be smaller for older applicants. This finding may be attributed to the fact that all fictitious applicants in our experiment were born, studied and worked in the Brussels Capital Region. Consequently, older applicants from a foreign background might have an advantage compared to their younger counterparts with foreign-sounding names. Further analyses for all subsamples (Appendix Table A9) indicate this to be true, especially for 12 years older applicants of both Polish and Moroccan descent.

Table 7. Linear probability models of employer response; interaction effects

		Interview invitation; strict sense	(Any) positive response; broad sense
Ethnicity (ref. Belgian)	Polish	-.035 (.045)	-.081 (.066)
	Moroccan	-.090** (.045)	-.178*** (.068)
Age (ref. young)	Old – 6 years older	.093* (.054)	-.042 (.066)
	Old – 12 years older	-.014 (.050)	-.144** (.065)
Gender (ref. female)	Male	-.081* (.044)	-.046 (.064)
Interaction-effects	**Foreign ethnicity x Older**	**-.042 (.057)**	**.148* (.080)**
	Foreign ethnicity x Male	**.106* (.055)**	**.019 (.081)**
	Older x Male	**-.032 (.059)**	**-.046 (.081)**
Constant		.184*** (.036)	.468*** (.047)

Note. Number of observations (job applications) is 864. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. Number of clusters (organisations) is 414. The data presented in this table is unweighted.

Separate analyses by sector, yield significant interaction-effects only for the private sectors (Table 8, columns 1 and 2). These interaction-effects are in line with earlier findings for the full sample. Further analyses for subsamples by detailed private sector (Table 8, columns 2a and 2b) reveal, only for the response in the strict sense and in the wholesale and retail sector (nace G), a positive interaction effect between a foreign ethnicity and being male, suggesting the negative effect of a foreign ethnicity to be smaller for men. For the response in the broad sense, we observe a weak interaction effect in both private sectors, albeit for different interaction-effects. In wholesale and retail sector (nace G), results suggest a weak negative interaction-effect (at the 10% significance level) between being older and male. This suggests the negative effect of being older to be larger for men. In the administrative and support service activities (nace N), we observe a weak positive

interaction-effect (at the 10% significance level) between a foreign ethnicity and being older. This suggests that for those applying to jobs, the negative effect of having a foreign ethnicity is smaller for older individuals. Importantly, the observed interaction-effects are not statistically different over all subsamples.[45]

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[45] It is probable that the subset consisting of public organisations continues to be hindered by a scarcity of observations.

Table 8. Linear probability models of employer response; interaction effects by sector

		Public sector, nace O	Private sector, nace G and N	Private sector, nace G	Private sector, nace N	χ² statistic			
		(1)	(2)	(2a)	(2b)	(1)=(2)	(1)=(2a)	(1)=(2b)	(2a)=(2b)
Interview invitation; strict sense									
Ethnicity (ref. Belgian)	Polish	.001 (.169)	-.044 (.045)	-.087 (.064)	.001 (.064)				
	Moroccan	.004 (.162)	-.105** (.046)	-.136** (.063)	-.072 (.068)				
Age (ref. young)	Old – 6 years older	.006 (.163)	.098* (.058)	.142* (.082)	.044 (.084)				
	Old – 12 years older	-.083 (.190)	-.008 (.050)	.055 (.075)	-.080 (.066)				
Gender (ref. female)	Male	-.152 (.158)	-.075* (.045)	-.113* (.059)	-.033 (.069)				
Interaction-effects	**Foreign ethnicity x Older**	**-.162 (.198)**	**-.019 (.058)**	**-.065 (.076)**	**.034 (.088)**	.52	.23	.89	.39
	Foreign ethnicity x Male	**.089 (.178)**	**.107* (.058)**	**.191** (.075)**	**.012 (.089)**	.01	.30	.16	2.42
	Older x Male	**.140 (.201)**	**-.050 (.061)**	**-.081 (.075)**	**-.016 (.097)**	.89	1.15	.52	.29
Constant		.307** (.140)	.169*** (.037)	.170*** (.055)	.168*** (.050)				
(Any) positive response; broad sense									
Ethnicity (ref. Belgian)	Polish	-.013 (.214)	-.094 (.069)	-.073 (.093)	-.094 (.100)				
	Moroccan	-.096 (.228)	-.191*** (.072)	-.165* (.089)	-.179* (.108)				
Age (ref. young)	Old – 6 years older	-.094 (.183)	-.031 (.071)	.070 (.096)	-.117 (.105)				
	Old – 12 years older	-.100 (.195)	-.148** (.070)	-.056 (.091)	-.195* (.103)				
Gender (ref. female)	Male	-.136 (.201)	-.034 (.068)	-.040 (.091)	.006 (.097)				
Interaction-effects	**Foreign ethnicity x Older**	**-.063 (.229)**	**.182** (.087)**	**.101 (.108)**	**.233* (.132)**	1.08	.45	1.34	.61
	Foreign ethnicity x Male	**.129 (.248)**	**.001 (.086)**	**.049 (.108)**	**-.079 (.130)**	.26	.10	.60	.58
	Older x Male	**.169 (.229)**	**-.078 (.087)**	**-.183* (.107)**	**-.006 (.133)**	1.10	2.10	.47	1.10
Constant		.446*** (.155)	.472*** (.050)	.351*** (.069)	.569*** (.068)				
Number of observations (job applications)		120	744	374	370				
Number of clusters (organisations)		46	368	185	183				

Note. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. The data presented in this table is unweighted.

5. Robustness analyses

In this section, we evaluate the reliability and stability of our main results under various conditions. First, we run a multivariate ordered logistic regression with the individual application as the observation unit and the employer response as the outcome variable. Doing so, we define the outcome variable as a categorical variable equal to 0 if the applicant received a negative or no response, 1 if they received a positive reaction and 2 if they were invited for a job interview.

First, we estimate three ordered logistic models (Models a, Table 9); Model 1a includes only the main candidate characteristics, Model 2a includes gender as well as the more detailed levels for ethnicity and age, and Model 3a also includes interaction effects between the main candidate characteristics (foreign ethnicity, older and male). The results of this analysis confirm our findings of the bivariate analysis and those of the linear probability models. We find the odds of a positive response to be lower for men compared to their female peers. For ethnicity and age, we find weak evidence that applicants with a Belgian-sounding name and younger applicants have a higher probability of a positive response. However, these overall effects again are driven by one of their sublevels. Specifically, we find applicants with a Moroccan ethnic background to have significantly lower odds of a positive response than applicants with a Belgian ethnic background, while we do not observe a significant effect for those of Polish ethnicity. Concerning age, we only find 12-year older applicants to have significantly lower odds of a positive response. For a 6-year age gap, we do not observe any significant effect. The latter finding is somewhat in contrast to the earlier findings, where we observed a weak positive effect of being 6 years older for securing a job interview (only). We do not observe any significant two-way interaction effects between ethnicity, age and gender. This aligns with our expectations, as the observed interaction effects in our benchmark analyses were only weakly significant and were not consistent across both outcomes (strict sense and broad sense).

Second, we re-run these three regressions, this time incorporating controls for both applicant and employer characteristics (Models b, Table 9). Notably, the inclusion of these controls does not sway our conclusions.[46] This is particularly reassuring, given that applicants are randomly assigned to vacancies, rendering employer characteristics unlikely to exert any substantial influence on the outcome.

Third, we interact the three main candidate characteristics with the applicant and employer characteristics (Model c, Table 9). While most interaction effects are insignificant, we find the odds of a positive response for candidates of non-Belgian ethnicity (versus candidates of Belgian descent) increases when they apply to larger organisations (>50 employees). Furthermore, we find hiring discrimination against men to be less severe if the applicant has a bachelor's degree or applied to a vacancy for a temporary position. Last, the results hint towards increased age

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[46] Results based on linear probability models controlling for both applicant and employer characteristics (Appendix Table A10) also yield similar results to our benchmark analyses.

discrimination for applicants with a bachelor's degree. These effects, however, are all only weakly significant.

Table 9. Ordered logistic regression of employer response

		(1a)	(2a)	(3a)	(1b)	(2b)	(3b)	(c)
Ethnicity (ref. Belgian)	Foreign	-.213** (.094)			-.227** (.105)			
	Polish		.000 (.135)	-.336 (.269)		-.022 (.148)	-.385 (.296)	-.509 (.591)
	Moroccan		-.446*** (.145)	-.781*** (.288)		-.457*** (.154)	-.824*** (.302)	-.945 (.601)
Age (ref. young)	Old (6-12 years older)	-.138 (.093)			-.149 (.104)			
	Old – 6 years older		.127 (.133)	.027 (.290)		.159 (.145)	.105 (.308)	.883 (.569)
	Old – 12 years older		-.420*** (.150)	-.525* (.281)		-.472*** (.162)	-.534* (.297)	.223 (.598)
Gender (ref. female)	Male	-.285*** (.093)	-.289*** (.095)	-.288 (.243)	-.322*** (.103)	-.331*** (.106)	-.398 (.263)	-.592 (.579)
Interaction-effects	Foreign ethnicity x Older			.455 (.349)			.368 (.367)	
	Foreign ethnicity x Male			.244 (.344)			.389 (.360)	
	Older x Male			-.248 (.352)			-.252 (.361)	
Control variables								
Diploma (ref. secondary education)	Tertiary education (bachelor)				.056 (.221)	.078 (.226)	.062 (.233)	-.042 (.297)
	Foreign ethnicity x Tertiary education							.240 (.296)
	Old x Tertiary education							-.538* (.307)
	Male x Tertiary education							.537* (.286)
Language of application (ref. Dutch)	French				-1.386*** (.211)	-1.388*** (.215)	-1.392*** (.218)	-1.151*** (.290)
	Foreign ethnicity x French							-.005 (.252)
	Old x French							-.241 (.253)
	Male x French							-.323 (.249)
Sector (ref. Nace O)	Nace G				-.146 (.362)	-.058 (.371)	-.046 (.376)	-.134 (.535)
	Nace N				.241 (.319)	.280 (.328)	.286 (.334)	.214 (.504)
	Foreign ethnicity x Nace N or G							.115 (.409)
	Old x Nace N or G							.028 (.405)
	Male x Nace N or G							.002 (.406)
Company size (ref. small)	Medium				.158 (.239)	.160 (.238)	.133 (.243)	.029 (.312)
	Large				-.012 (.241)	.021 (.246)	.049 (.247)	-.112 (.330)
	Foreign ethnicity x Medium or large							.523** (.254)
	Old x Medium or large							-.189 (.253)
	Male x Medium or large							-.049 (.248)
	Unknown				.057 (.386)	.057 (.379)	.004 (.379)	.151 (.483)
	Foreign ethnicity x Unknown							.215 (.362)
	Old x Unknown							-.410 (.361)
	Male x Unknown							.056 (.373)
Contract duration (ref. indefinite contract)	Temporary contract				-.013 (.207)	.000 (.209)	.003 (.216)	-.004 (.293)
	Foreign ethnicity x Temporary contract							-.230 (.282)
	Old x Temporary contract							-.378 (.285)
	Male x Temporary contract							.618** (.279)
	Unknown				-.328 (.288)	-.348 (.289)	-.352 (.293)	.065 (.390)
	Foreign ethnicity x Unknown							-.334 (.389)
	Old x Unknown							-.348 (.386)
	Male x Unknown							-.334 (.380)

(Table 9 continued)

Work schedule	Part-time				.421 (.303)	.351 (.302)	.334 (.311)	.606 (.376)
(ref. fulltime)	Foreign ethnicity x Part-time							.209 (.382)
	Old x Part-time							-.137 (.398)
	Male x Part-time							-.662* (.377)
	Unknown				-.869 (.688)	-.973 (.692)	-.986 (.697)	-.025 (1.750)
	Foreign ethnicity x Unknown							-.500 (1.425)
	Old x Unknown							-.262 (1.429)
	Male x Unknown							-13.478*** (1.664)
Intercepts								
Rejection or no reaction | Other positive reaction		.247	.242	.140	-.387	-.332	-.458	-0.356
Other positive reaction | Interview invitation		1.510	1.517	1.420	1.014	1.085	.964	1.080

Note. Number of observations (job applications) is 864. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. Number of clusters (organisations) is 414. The data presented in this table is unweighted.

Fourth, while the experiment was designed to study age gaps between younger and older applicants with an age difference of 6 to 12 years, we run a final robustness analysis where we include all ages (as indicated on the CVs through the year of birth) (Models a, Table 10) and the age gap relative to the younger applicant (aged either 38 or 44 years) within a pair of applications (Model b, Table 10). Doing so, we re-run our benchmark analysis. In Model a, our findings reveal that the oldest applicants aged 56 have a significantly lower probability of being invited to a job interview, as well as receiving a positive response. This pattern is also reflected in Model b, where we only observe a negative age effect for applicants who are 12 years older than their 44-year-old peers. However, additional analyses indicate that the negative effect for this group is not significantly different from the (insignificant) negative coefficient for applicants who are 12 years older than their 38-year-old peers.

Table 10. Linear probability models of employer response; detailed analysis for age

			Interview invitation; strict sense		(Any) positive response; broad sense	
			(1a)	**(1b)**	**(2a)**	**(2b)**
Ethnicity (ref. Belgian)	Polish		-.002 (.024)	-.002 (.024)	.002 (.032)	.002 (.032)
	Moroccan		-.058*** (.022)	-.058*** (.022)	-.095*** (.031)	-.095*** (.031)
Age (ref. 38 years old)	44 years old	*(a44)*	.004 (.026)		-.024 (.037)	
	50 years old	*(a50)*	-.008 (.031)		-.045 (.041)	
	56 years old	*(a56)*	-.094*** (.033)		-.152*** (.054)	
Age (ref. 38 years old)	6 years older	*(a38_6)*		.075** (.036)		.018 (.046)
	12 years older	*(a38_12)*		-.023 (.033)		-.054 (.046)
Age (ref. 44 years old)	6 years older	*(a44_6)*		.034 (.037)		.000 (.047)
	12 years older	*(a44_12)*		-.081*** (.027)		-.134*** (.043)
Gender (ref. female)	Male		-.044*** (.016)	-.044*** (.016)	-.060*** (.022)	-.060*** (.022)
Constant			.189*** (.029)	.176*** (.022)	.455*** (.036)	.438*** (.028)
F-statistic	*(a44)=(a50)*		.20		.34	
	(a50)=(a56)		6.35**		3.85*	
	(a38_6)=(a44_6)			.57		.06
	(a38_12)=(a44_12)			2.18		1.64

Note. Number of observations (job applications) is 864. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. Number of clusters (organisations) is 414. The data presented in this table is unweighted.

Last, to assess differences in discriminatory practices in hiring between small and larger companies, we ran linear probability models for a subsample of organisations with 50 employees or less and more than 50 employees (Table 11). These additional analyses do not suggest significant variation in discrimination between small and medium to large firms, with the exception of a significant difference in ethnic discrimination for employer responses in the broad sense (any positive reaction). Specifically, applicants of Moroccan descent appear to face higher discriminatory effects in smaller companies.

Table 11. Linear probability models of employer response; detailed analysis by company size

Company size		Interview invitation; strict sense		(Any) positive response; broad sense		χ² statistic	
		Small (≤50 employees)	Medium or large (>50 employees)	Small (≤50 employees)	Medium or large (>50 employees)		
		(1a)	(1b)	(2a)	(2b)	(1a)=(1b)	(2a)=(2b)
Ethnicity	Polish	-.034 (.032)	.021 (.041)	-.011 (.042)	.006 (.057)	1.14	0.06
(ref. Belgian)	Moroccan	-.065** (.029)	-.031 (.035)	-.147*** (.039)	.004 (.054)	0.58	5.29**
Age	Old – 6 years older	.060* (.034)	.040 (.038)	.055 (.043)	-.034 (.051)	0.15	1.83
(ref. young)	Old – 12 years older	-.036 (.029)	-.056 (.040)	-.066 (.041)	-.109* (.058)	0.17	0.37
Gender	Male	-.035 (.021)	-.057** (.028)	-.089*** (.029)	-.032 (.037)	0.39	1.48
(ref. female)							
Constant		.175*** (.030)	.167*** (.036)	.399*** (.038)	.491*** (.046)	0.03	2.49
Number of observations (job applications)		492	310	492	310		
Number of clusters (organisations)		243	140	243	140		

Note. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. The data presented in this table is unweighted.

Conclusion

This study contributes to the empirical literature on the relative rates of ethnic, age and gender discrimination and their intersectionality in three prominent sectors in the metropolitan context of the Brussels Capital Region. Specifically, we investigate the private sectors of 'Wholesale and retail trade; repair of motor vehicles and motorcycles' (nace G) and 'Administrative and support service activities' (nace N), and the public sector 'Public administration and defence; compulsory social security' (nace O). These sectors represent a substantial share of overall employment in the Brussels Capital Region.[47]

In this study, we causally estimate the relative rates of ethnic (Polish or Moroccan versus Belgian), age (6- or 12-year age gap) and gender (male, female) discrimination and their intersectionality on the likelihood of receiving a job interview invitation or a positive response through a correspondence experiment. We present findings for the entire sample and individual sectors separately.

Results indicate that despite similar background characteristics, such as birthplace, education, and professional experience within the Brussels-Capital Region, hiring discrimination based on ethnicity, age and gender persists. Particularly, our findings reveal female applicants are more likely to be invited to a job interview or receive a positive response compared to male applicants. Recent studies in Ghent and Antwerp (Baert, Dalle, Lippens, & Malfait, 2021; Baert, Dalle, Lippens, Malfait, et al., 2021) did not find evidence of gender discrimination. These experiments however adopted a different approach where gender was constant within each pair of applications, whereas gender varied within each pair in our experiment. Notwithstanding, overrepresentation of women in human resource professions, the results are in line with our expectations.

Regarding ethnicity, evidence suggests that hiring discrimination is experienced only by individuals of Moroccan (non-EU) descent when compared to Belgian applicants, with no observed effects for those of Polish (EU) descent. These results are in line with correspondence research in Ghent and Antwerp where applicants of non-EU descent encountered discrimination (Baert, Dalle, Lippens, & Malfait, 2021; Baert, Dalle, Lippens, Malfait, et al., 2021) and research in the Brussels Capital Region on the shared short-term rental market of Airbnb (Verhaeghe et al., 2023) and on the private rental market (Verhaeghe et al., 2017), where discrimination was observed only for individuals of Moroccan with no observed effects for those of Polish descent.

For age, our results indicate that only a substantial age gap of twelve years is penalised in the Brussels labour market (relative to the ages of 38 and 44 years). While the studies in Ghent and Antwerp (Baert, Dalle, Lippens, & Malfait, 2021; Baert, Dalle, Lippens, Malfait, et al., 2021) do not differentiate between an age gap of six or twelve years, these results qualitatively point towards

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[47] These three sectors combined represented 35.2% of all employees working in the Brussels Capital Region (place of work).

the same conclusion with older applicants with additional irrelevant experience having a lower likelihood of receiving a job interview invitation or any positive response.

The results suggest the presence of persistent ethnic, gender, and age biases that extend beyond mere compatibility of qualifications and perceived skills. Exploring the intersectionality of ethnicity, age, and gender, we find no robust evidence that these characteristics substitute or complement one another. When comparing the coefficients for ethnicity, age, and gender, we find the effects of Moroccan ethnic descent, a 12-year age gap, and being male are not statistically significant from one another.

Analyses for subsamples with organisations from the public and the two private sectors (nace G and N) reveal significant discriminatory effects only among the private sector organisations. Observed discriminatory effects in the public sector are qualitatively similar to the private sector, but not statistically significant. Further examination reveals that the significant effects found in the private sector are not statistically different from the non-significant effects in the public sector. The lack of significance in the public sector subsample could be due to the limited number of observations. Evidence thus suggests hiring discrimination exists within private sector organisations in the wholesale and retail sector (nace G) or administrative and support service activities (nace N), but it would be premature to conclude the absence of discrimination within the public sector.

Several important implications can be drawn from these results. First, as hiring discrimination seems to be present for all three characteristics, governments should not prioritise addressing one of these characteristics but rather target all simultaneously. In adopting this comprehensive approach, particular attention should be directed towards individuals who combine multiple characteristics and therefore accumulate negative effects (e.g. an older man of Moroccan ethnicity).

Policy recommendations stemming from the research findings include raising awareness and providing training on biases and stereotypes, as various unconscious biases can creep into assessment processes. Furthermore, policies should focus on informing employers about legislation prohibiting discrimination, including the anti-racism law, the law on equality between women and men, and the anti-discrimination law. These awareness-raising initiatives can be implemented through various means, including poster campaigns and events. Throughout these initiatives, it is crucial to emphasize the benefits diversity can bring to a company. Additionally, a regulatory framework for anonymous job applications could be considered. Under this framework, sensitive personal attributes such as gender, ethnicity, or age, which are protected against discrimination by law, would be omitted from CVs prior to the evaluation of the job applicants. In Belgium, Accent, a talent placement organisation, introduce anonymous CVs in February 2023 (Trends, 2024). The organisation reports a favourable impact of this measure (Accent, 2024). However, the impact of such measure should be thoroughly investigated, as research suggests that while anonymous CVs may mitigate certain forms of discrimination, they may shift discrimination to a later stage of the recruitment process (Åslund & Skans, 2012; Krause et al., 2012).

Furthermore, policy efforts could aim to promote diversity and inclusion in the workplace, which can be an effective strategy if exposure to diverse groups in society leads to reduced biases and discrimination ("contact theory"). However, if exposure to diversity exacerbates discrimination ("visibility-discrimination"), this strategy may not be effective. Although limited research supports the "visibility-discrimination" theory, further investigation is crucial. Finally, to assess the impact of these policy measures, it is crucial to monitor the evolution in discriminatory practices in the labour market in future research, for example through follow-up correspondence experiments across a broad spectrum of companies. Based the analyses by sector, we observed discriminatory practices in the private sectors of wholesale and retail sector (nace G) or administrative and support service activities (nace N). It therefore seems important to further monitor these sectors. Notwithstanding, based on this study, we could not rule out discrimination in the public sector, as well as in sectors not included in the experiment. This underscores the need for a comprehensive policy framework that addresses various forms of discrimination across multiple sectors simultaneously. Notwithstanding, we warrant against using field tests to single out and penalize individual companies. This primarily because (1) these tests require a large number of observations to detect discrimination accurately, (2) the results are confined to the specific characteristics being tested and (3) in the case of repeated field tests at one organisation, the probability of detection of the experiment as well as the costs for the employer concerned increase substantially. Furthermore, setting up field tests necessitates technical expertise and, preferably, ethical approval.

To address the need for further research in guiding applicants, employers, and governments to mitigate discrimination in the labour market, we advance several avenues for future research. First, for gaining a comprehensive understanding of ethnic discrimination in the labour market, it is crucial that future research explores discrimination of applicants from other ethnic backgrounds. While the observed negative effect for applicants of Moroccan (non-EU) ethnicity may signal challenges faced by all individuals of non-EU descent, there may still be differences in job prospects based on specific non-EU ethnicities. Additionally, also for EU ethnicities, we suspect variations in job prospects based on specific EU ethnicities. Second, all fictional applicants in our experiment were born, studied, work and reside in the Brussels Capital Region. Consequently, potential differences in labour market opportunities related to factors such as diploma compatibility and nationality (and/or country of birth) were not investigated. Future research focusing on the applicant's country of birth and/or where they obtained their degree (in Belgium, in Europe, or outside Europe) could complement our study. Third, our study was characterised by a low number of public organisations, which prohibited in-depth analyses by type of organisation. Further research on this therefore is deemed necessary. Fourth, to explore solutions aimed at combating discrimination in the labour market, we encourage future research investigating the impact of anonymous job applications on both hiring chances (positive reaction to an application incl. an interview invitation) and actual job offers. Firth, follow-up studies investigating the evolution in discriminatory practices in the labour market, are deemed crucial. In case of repeated experimentation, particular consideration should be given to the costs for the employers involved and the increasing likelihood of detection. It is

therefore recommended to schedule a longer period between measurements and/or to exclude companies that have been involved in earlier correspondence testing from follow-up studies. Sixth, in light of the metropolitan context of the Brussels Capital Region, it is imperative to explore contextual factors to inform policymakers. This entails specifically assessing the influence of exposure to various societal groups on labour market discrimination, to see whether exposure increases ("visibility-discrimination") or decreases ("contact theory") the discriminatory response. Related, further investigation is required to explore underlying mechanisms to gain deeper insights into observed discriminatory responses. Mechanisms warranting further investigation encompass human capital theory related to (perceived) acquired knowledge and competencies (G. S. Becker, 1964; Mincer, 1958, 1989), and signalling and screening theory related to (perceived) pre-existing characteristics (Arrow, 1973; Spence, 1973; Stiglitz, 1975; Stiglitz & Weiss, 1990).

The aforementioned avenues for future research can be achieved, among other, through the use of correspondence experiments and/or stated choice (vignette) experiments. Both experiments present respondents - potential employers - with fictitious job applications that vary (among other things) on the characteristics of interest (e.g. ethnicity, nationality, age and gender). The main distinction between these two experimental approaches is informed consent. In correspondence experiments, pairs of similar fictitious applications are sent to real vacancies, without the employers' knowledge of their participation in the experiment. The employers' responses provide unbiased insights into their preferences. In vignette research, employers voluntarily participate in a questionnaire in which they read a hypothetical job description and then evaluate fictitious candidates. Because employers consent to participate in the study, this method has fewer ethical considerations. Additionally, the method allows researchers to explore the mechanisms underlying the decision to hire particular groups of applicants through the inclusion of additional statements about the mechanisms after each vignette. Furthermore, while research suggests the effects of the applicant attributes estimated from the vignette experiments and correspondence experiments to be remarkably similar (Hainmueller et al., 2015), it cannot be excluded that the results from vignette experiments are influenced by socially desirable behaviour. Both types of experiments provide valuable tools for researchers to understand preferences and decision-making in the labour market.

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Appendix

Appendix A

Table A1. Design: repetitions of the factorial field experiment based on the sublevels

Number of the repetition(s) of design	Adopted sublevel		
	Foreign ethnic background	Age: Young	Age: old
1	Moroccan	38	38+6
2	Moroccan	38	38+12
3	Polish	38	38+6
4	Polish	38	38+12
5	Moroccan	44	44+6
6	Moroccan	44	44+12
7	Polish	44	44+6
8	Polish	44	44+12

Note. See Table 1 for all characteristics and their (sub)levels and Table 2 for the factorial experimental design.

Table A2. Post-experiment correlations between factors

		1	2	3
Full sample (N=864)				
1	Ethnical background	1		
2	Age	.000	1	
3	Gender	.000	.000	1
Public sector, nace O (N=120)				
1	Ethnical background	1		
2	Age	.100	1	
3	Gender	.033	.133	1
Private sector, nace G and N (N=744)				
1	Ethnical background	1		
2	Age	.016	1	
3	Gender	.005	.022	1
Private sector, nace G (N=374)				
1	Ethnical background	1		
2	Age	.027	1	
3	Gender	.027	.027	1
Private sector, nace G (N=370)				
1	Ethnical background	1		
2	Age	.060	1	
3	Gender	.016	.070	1

Note. N represents the number of observations (job applications). (Absolute value of) Cramer's V is reported as all values are categorical. The data presented in this table is unweighted.

Table A3. Interaction post-experiment level balances

Interaction	Mean				
	Full sample	**Public sector, nace O**	**Private sector, nace G and N**	**Private sector, nace G**	**Private sector, nace N**
Ethnical background x Age					
Belgian x Young	.250	.225	.254	.243	.265
Foreign x Young	.250	.275	.246	.257	.235
Ethnical background x Gender					
Belgian x Male	.250	.242	.251	.257	.246
Foreign x Male	.250	.258	.249	.243	.254
Age x Gender					
Young x Male	.250	.283	.245	.257	.232
Old x Male	.250	.217	.255	.243	.268
Number of observations (job applications)	864	120	744	374	370

Note. Standard deviations are not reported as all variables are binary. The data presented in this table is unweighted.

Table A4. Overview of the jobs (in Dutch and French, and translated to English)

	ENG (translation)	Dutch job title	French job title (male and female)
	(Professional) bachelor's degree required		
1.	Accountant	Boekhouder	Comptable
2.	Administrative and financial officer	Administratief en financieel verantwoordelijke	Responsable administratif et financier Responsable administrative et financière
3.	Administrative assistant	Administratief medewerker	Assistant administratif Assistante administrative
4.	Cleaning officer	Schoonmaakverantwoordelijke	Responsable du nettoyage
5.	Commercial assistant	Commercieel medewerker	Employé commercial Employée commerciale
6.	Coordinator socio-cultural work	Coördinator sociocultureel werk	Coordinateur de travail socio-culturel Coordinatrice de travail socio-culturel
7.	Customs declarant	Douanedeclarant	Déclarant en douane Déclarante en douane
8.	Database manager	Databankbeheerder	Administrateur de base de données Administratice de base de données
9.	General staff member	Algemeen medewerker	Employé polyvalent Employée polyvalente
10.	HR employee	Personeelsmedewerker	Employé en ressources humaines Employée en ressources humaines
11.	ICT analyst	Analist ICT	Analyste TIC
12.	ICT analyst-programmer	Analist-programmeur ICT	Analyste-programmeur TIC Analyste programmeuse TIC
13.	ICT information manager	ICT-informatiemanager	Gestionnaire de projets TIC
14.	ICT integration and implementation assistant	Medewerker Integratie en Implementatie ICT	Employé en intégration et implémentation des TIC Employée en intégration et implémentation des TIC
15.	Insurance adviser	Verzekeringsadviseur	Conseiller en assurances Conseillère en assurances
16.	IT analyst	IT-analist	Analyste informatique
17.	Logistics manager	Verantwoordelijke logistiek	Responsable logistique
18.	Management assistant	Management assistent	Assistant de gestion Assistante de gestion
19.	Purchaser	Aankoper	Acheteur Acheteuse
20.	Responsible consumer service	Verantwoordelijke consumentendienst	Responsable du service consommateur
21.	Sales manager	Verkoopverantwoordelijke	Responsable des ventes
22.	Sales representative	Vertegenwoordiger	Représentant Représentante
23.	Social-cultural worker	Sociaal-cultureel werker	Animateur socio-culturel Animatrice socio- culturelle
24.	Technical-commercial representative	Technisch-commercieel gedelegeerde	Délégué technico-commercial Déléguée technico-commerciale
25.	Training and recruitment coordinator	Opleidings- en Wervingscoördinator	Manager de la formation et du recrutement
26.	Training manager	Opleidingsverantwoordelijke	Responsable de formation

(Table A4 continued)

	Technical secondary education required		
27.	Department manager	Departementsverantwoordelijke	Responsable de département
28.	Optimisation engineer	Optimalisatie-ingenieur	Ingénieur d'optimisation
29.	Packaging officer	Verpakkingsmedewerker	Ouvrier d'emballage Ouvrière d'emballage
30.	Packaging operator	Verpakkingsoperator	Opérateur de conditionnement Opératrice de conditionnement
31.	Production employee	Productiemedewerker	Opérateur de production Opératrice de production
32.	Production employee food processing	Productiemedewerker voeding	Ouvrier de production alimentaire Ouvrière de production alimentaire
33.	Production employee plastics processing	Productiemedewerker kunststofverwerking	Ouvrier de production dans le traitement des matières plastiques Ouvrière de production dans le traitement des matières plastiques
34.	Recycling sorter	Sorteerder recyclage	Trieur de recyclage/ Trieuse de recyclage
35.	Store manager	Winkelverantwoordelijke	Responsable du magasin
36.	Technical expert customer support	Technisch expert klantenondersteuning	Expert technique en soutien client Experte technique en soutien client
37.	Warehouse assistant	Medewerker opslagplaats	Employé de dépôt Employée de dépôt
38.	Warehouse manager	Magazijnverantwoordelijke	Responsable de magasin
	Vocational secondary education required		
39.	Call centre employee	Callcentermedewerker	Agent de centre d'appel
40.	Cleaner	Schoonmaker	Nettoyeur Nettoyeuse
41.	Hygiene and pest control assistant	Medewerker hygiëne en ongediertebestrijding	Employé en hygiène et lutte antiparasitaire Employée en hygiène et lutte antiparasitaire
42.	Kitchen assistant	Keukenmedewerker	Cuisinier Cuisinière
43.	Nurse	Verpleegkundige	Infirmier Infirmière
44.	Polyvalent employee	Polyvalent medewerker	Employé polyvalent Employée polyvalente
45.	Receptionist-telephonist	Receptionist-telefonist	Réceptionniste-téléphoniste
46.	Store assistant	Winkelmedewerker	Collaborateur en magasin Collaboratrice en magasin

Table A5. Number of negative and positive responses by group

Applicant characteristic		N	Interview invitation				Any positive response			
			Neither positive response	Both positive response	Only group 1 positive response	Only group 2 positive response	Neither positive response	Both positive response	Only group 1 positive response	Only group 2 positive response
Full sample										
Ethnicity	Group 1 Belgian, Group 2 Foreign£	432	347	36	31	18	229	111	56	36
Age	Group 1 Young, Group 2 Old$	432	347	36	24	25	229	111	55	37
Gender	Group 1 Female, Group 2 Male	432	347	36	34	15	229	111	59	33
Public sector, nace O										
Ethnicity	Group 1 Belgian, Group 2 Foreign£	60	41	9	6	4	31	14	8	7
Age	Group 1 Young, Group 2 Old$	60	41	9	6	4	31	14	9	6
Gender	Group 1 Female, Group 2 Male	60	41	9	6	4	31	14	7	8
Private sector, nace G and N										
Ethnicity	Group 1 Belgian, Group 2 Foreign£	372	306	27	25	14	198	97	48	29
Age	Group 1 Young, Group 2 Old$	372	306	27	18	21	198	97	46	31
Gender	Group 1 Female, Group 2 Male	372	306	27	28	11	198	97	52	25
Private sector, nace G										
Ethnicity	Group 1 Belgian, Group 2 Foreign£	187	153	9	17	8	117	28	25	17
Age	Group 1 Young, Group 2 Old$	187	153	9	10	15	117	28	24	18
Gender	Group 1 Female, Group 2 Male	187	153	9	18	7	117	28	31	11
Private sector, nace N										
Ethnicity	Group 1 Belgian, Group 2 Foreign£	185	153	18	8	6	81	69	23	12
Age	Group 1 Young, Group 2 Old$	185	153	18	8	6	81	69	22	13
Gender	Group 1 Female, Group 2 Male	185	153	18	10	4	81	69	21	14

Note. N equals the number of vacancies. The data presented in this table is unweighted. £ indicates the candidate has a foreign (Moroccan or Polish) sounding name. $ indicated the applicant is 6 or 12 years older than the younger applicant.

Table A6. Logit models of employer response

		Interview invitation; strict sense		(Any) positive response; broad sense	
		(1a)	(1b)	(2a)	(2b)
Ethnicity (ref. Belgian)	Foreign	-.252* (.136)		-.201** (.096)	
	Polish		-.018 (.187)		.010 (.138)
	Moroccan		-.541** (.226)		-.430*** (.147)
Age (ref. young)	Old (6-12 years older)	.019 (.134)		-.181* (.095)	
	Old – 6 years older		.408** (.163)		.039 (.134)
	Old – 12 years older		-.518** (.258)		-.420*** (.151)
Gender (ref. female)	Male	-.369*** (.135)	-.374*** (.138)	-.262*** (.095)	-.265*** (.096)
Constant		-1.532*** (.162)	-1.529*** (.162)	-.243** (.115)	-.241** (.116)

Note. Number of observations (job applications) is 864. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. Number of clusters (organisations) is 414. The data presented in this table is unweighted.

Table A7. Linear probability models of employer response; main effects with standard errors clustered at the vacancy level

			Interview invitation; strict sense		(Any) positive response; broad sense	
			(1a)	(1b)	(2a)	(2b)
Ethnicity (ref. Belgian)	Foreign	*(e)*	-.030* (.016)		-.046** (.022)	
	Polish			-.002 (.024)		.002 (.032)
	Moroccan	*(e_m)*		-.058*** (.022)		-.095*** (.031)
Age (ref. young)	Old (6-12 years older)	*(a)*	.002 (.016)		-.042* (.022)	
	Old – 6 years older			.056** (.024)		.009 (.031)
	Old – 12 years older	*(a_12)*		-.051** (.022)		-.093*** (.032)
Gender (ref. female)	Male	*(g)*	-.044*** (.016)	-.044*** (.016)	-.060*** (.022)	-.060*** (.022)
Constant			.176*** (.022)	.176*** (.022)	.438*** (.028)	.438*** (.028)

Note. Number of observations (job applications) is 864. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. Number of clusters (vacancies) is 432. The data presented in this table is unweighted.

Table A8. Linear probability models of employer response; main effects by sector

			Public sector, nace O (1)	Private sector, nace G and N (2)	Private sector, nace G (2a)	Private sector, nace N (2b)	χ^2 statistic (1)=(2)	(1)=(2a)	(1)=(2b)	(2a)=(2b)
Interview invitation; strict sense										
Ethnicity (ref. Belgian)	Foreign	(e)	-.036 (.053)	-.030* (.017)	-.049* (.026)	-.010 (.020)	.01	.05	.22	1.41
Age (ref. young)	Old (6-12 years older)	(a)	-.042 (.052)	.010 (.017)	.024 (.026)	-.008 (.020)	.93	1.33	.39	.95
Gender (ref. female)	Male	(g)	-.038 (.052)	-.046*** (.017)	-.059** (.026)	-.032 (.020)	.02	.14	.01	.72
Constant			.291*** (.079)	.158*** (.023)	.157*** (.034)	.160*** (.031)	2.72	2.52	2.48	.00
(Any) positive response; broad sense										
Ethnicity (ref. Belgian)	Foreign	(e)	-.022 (.066)	-.051** (.023)	-.047 (.034)	-.056* (.032)	.18	.11	.23	.04
Age (ref. young)	Old (6-12 years older)	(a)	-.051 (.064)	-.038* (.023)	-.036 (.034)	-.043 (.032)	.04	.04	.01	.02
Gender (ref. female)	Male	(g)	.011 (.064)	-.072*** (.023)	-.109*** (.034)	-.034 (.032)	1.52	2.82*	.40	2.65
Constant			.389*** (.078)	.445*** (.030)	.358*** (.044)	.534*** (.042)	.45	.13	2.79*	8.60***
Number of observations (job applications)			120	744	374	370				
Number of clusters (organisations)			46	368	185	183				

Note. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. The data presented in this table is unweighted.

Table A9. Linear probability models of employer response for subsamples by ethnicity, age and gender

		Interview invitation; strict sense				χ² statistic			**(Any) positive response**; broad sense				χ² statistic		
		(1)	(2)	(2a)	(2b)	(1)=(2)	(1)=(2a)	(1)=(2b)	(3)	(4)	(4a)	(4b)	(3)=(4)	(3)=(4a)	(3)=(4b)
Subgroup by ethnicity		**Belgian**	**Foreign**	**Polish**	**Moroccan**				**Belgian**	**Foreign**	**Polish**	**Moroccan**			
Age (ref. young)	Old – 6 years older	.088* (.048)	.023 (.042)	.000 (.064)	.046 (.057)	.74	.91	.27	-.037 (.059)	.056 (.057)	.028 (.083)	.083 (.078)	.91	.32	1.22
	Old – 12 years older	-.042 (.037)	-.060* (.034)	-.056 (.055)	-.065* (.039)	.12	.04	.16	-.194*** (.053)	.009 (.055)	.009 (.081)	.009 (.075)	5.45**	3.72*	4.13**
Gender (ref. female)	Male	-.097*** (.034)	.009 (.030)	.046 (.047)	-.028 (.040)	3.78*	4.66**	1.38	-.069 (.046)	-.051 (.045)	-.019 (.066)	-.083 (.062)	.05	.29	.02
	Constant	.192*** (.032)	.130*** (.026)	.144*** (.039)	.116*** (.037)				.479*** (.041)	.350*** (.039)	.389*** (.056)	.310*** (.055)			
Number of observations		432	432	216	216				432	432	216	216			
Number of clusters		414	414	211	212				414	414	211	212			
Subgroup by age		**Young**	**Old**	**Old – 6 years older**	**Old – 12 years older**				**Young**	**Old**	**Old – 6 years older**	**Old – 12 years older**			
Ethnicity (ref. Belgian)	Polish	.023 (.044)	-.028 (.042)	-.065 (.066)	.009 (.049)	.51	.90	.04	-.065 (.058)	.069 (.057)	.000 (.083)	.139* (.078)	2.01	.33	3.72*
	Moroccan	-.042 (.037)	-.074* (.038)	-.083 (.064)	-.065* (.039)	.29	.26	.16	-.176*** (.055)	-.014 (.055)	-.056 (.081)	.028 (.075)	3.27*	1.21	4.13**
Gender (ref. female)	Male	-.028 (.034)	-.060* (.033)	-.093* (.053)	-.028 (.040)	.30	.76	.00	-.037 (.047)	-.083* (.045)	-.102 (.066)	-.065 (.062)	.33	.47	.10
	Constant	.157*** (.032)	.197*** (.033)	.278*** (.053)	.116*** (.036)				.463*** (.041)	.370*** (.040)	.458*** (.059)	.282*** (.053)			
Number of observations		432	432	216	216				432	432	216	216			
Number of clusters		414	414	212	212				414	414	212	212			
Subgroup by gender		**Male**	**Female**						**Male**	**Female**					
Ethnicity (ref. Belgian)	Polish	.069* (.041)	-.074* (.041)			4.70**			.028 (.057)	-.023 (.058)			.29		
	Moroccan	-.023 (.034)	-.093** (.040)			1.38			-.102* (.053)	-.088 (.057)			.02		
Age (ref. young)	Old – 6 years older	.023 (.040)	.088* (.048)			.77			-.023 (.056)	.042 (.059)			.47		
	Old – 12 years older	-.051 (.036)	-.051 (.039)			.00			-.106* (.055)	-.079 (.056)			.09		
	Constant	.113*** (.025)	.194*** (.033)						.384*** (.041)	.431*** (.042)					
Number of observations		432	432						432	432					
Number of clusters		414	414						414	414					

Note. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the organisation level, displayed in parentheses. The data presented in this table is unweighted. The number of observations reflects the number of job applications. The number of clusters reflects the number of organisations.

Table A10. Linear probability models of employer response, controlling for employment characteristics; detailed effects by sector

		Interview invitation; strict sense					(Any) positive response; broad sense				
		Full sample	Public sector, nace O	Private sector, nace G and N	Private sector, nace G	Private sector, nace N	Full sample	Public sector, nace O	Private sector, nace G and N	Private sector, nace G	Private sector, nace N
Ethnicity (ref. Belgian)	Polish	-.007 (.024)	-.052 (.085)	-.005 (.024)	-.018 (.037)	.011 (.031)	-.003 (.032)	-.024 (.108)	-.007 (.033)	.010 (.050)	-.040 (.043)
	Moroccan	-.053** (.021)	-.017 (.064)	-.056** (.022)	-.077** (.032)	-.034 (.032)	-.090*** (.030)	-.020 (.084)	-.096*** (.032)	-.097** (.041)	-.076 (.049)
Age (ref. young)	Old – 6 years older	.054** (.024)	-.015 (.067)	.063** (.025)	.069* (.038)	.046 (.034)	.009 (.031)	-.053 (.075)	.025 (.033)	.035 (.046)	.004 (.049)
	Old – 12 years older	-.050** (.023)	-.087 (.091)	-.042* (.023)	-.018 (.036)	-.065** (.028)	-.093*** (.031)	-.049 (.117)	-.100*** (.032)	-.103** (.046)	-.092** (.045)
Gender (ref. female)	Male	-.044*** (.016)	-.038 (.054)	-.047*** (.017)	-.058** (.027)	-.034* (.020)	-.060*** (.022)	.010 (.068)	-.073*** (.023)	-.107*** (.034)	-.036 (.033)
Control variables											
Diploma (ref. secondary education)	Tertiary education (bachelor)	.019 (.031)	-.075 (.119)	-.003 (.033)	.033 (.042)	-.031 (.059)	.010 (.043)	.021 (.173)	.001 (.046)	.023 (.062)	-.047 (.066)
Language of application (ref. Dutch)	French	-.154*** (.035)	-.184* (.103)	-.141*** (.037)	-.133** (.054)	-.165*** (.051)	-.317*** (.045)	-.114 (.110)	-.346*** (.051)	-.181** (.077)	-.454*** (.063)
Company size (ref. small)	Medium	-.040 (.038)	-.086 (.176)	-.066* (.037)	.023 (.062)	-.120** (.053)	.067 (.054)	-.101 (.146)	.095 (.060)	.070 (.085)	.080 (.087)
	Large	-.046 (.043)	-.177 (.164)	-.065 (.044)	.080 (.085)	-.134** (.056)	.033 (.055)	-.149 (.126)	.085 (.066)	.130 (.114)	.011 (.081)
	Unknown	.025 (.066)	-.371** (.156)	.045 (.068)	.056 (.098)	.038 (.093)	.013 (.074)	-.385*** (.127)	.023 (.074)	-.025 (.123)	.037 (.101)
Contract duration (ref. indefinite contract)	Temporary contract	.003 (.035)	.089 (.095)	-.029 (.036)	.008 (.056)	-.035 (.048)	.011 (.047)	.288** (.113)	-.041 (.052)	-.147** (.068)	.021 (.077)
	Unknown	-.028 (.039)	.365* (.183)	-.067** (.032)	-.025 (.045)	-.096* (.053)	-.067 (.050)	.292 (.197)	-.094* (.053)	-.091 (.071)	-.149 (.090)
Work schedule (ref. fulltime)	Part-time	.065 (.044)	.192 (.244)	.061 (.044)	.009 (.046)	.144 (.100)	.031 (.052)	.132 (.182)	.032 (.055)	-.020 (.060)	.171* (.100)
	Unknown	-.014 (.062)	-.338* (.189)	.004 (.065)	.033 (.085)	-.031 (.106)	-.098 (.064)	-.416* (.212)	-.085 (.069)	-.106 (.095)	-.079 (.085)
Constant		.261*** (.046)	.481*** (.172)	.271*** (.050)	.231*** (.063)	.311*** (.081)	.601*** (.058)	.396** (.192)	.649*** (.062)	.529*** (.090)	.758*** (.083)
Number of observations		864	120	744	374	370	864	120	744	374	370
Number of organisations		414	46	368	185	183	414	46	368	185	183

Note. * (**) ((***)) indicates significance at the 10% (5%) ((1%)) level. Standard errors are clustered at the orginisation level, displayed in parentheses. The data presented in this table is unweighted.

Thomas Goossens

Personal details	Experience

<table>
<tr><td>

Personal details

- **Address**

  Ongenastraat 63

  1090 Jette (Belgium)

- **Date of birth**

  18/4/1985, Brussels

- **Nationality**

  Belgian

- **Phonenumber**

  0032 491/62.18.94

- **email**

  Goossens_Thomas@yahoo.com

- **Driving license**

  B

</td><td>

Experience

- Warehouse manager, COOLS (2014-present)

- Warehouse manager, CAMARA (2003-2014)

Skills

Digital skills

- MSWord: Very good

- MSExcel: Very good

- MSPowerpoint: Very good

Languages

- Dutch: excellent

- French: excellent

- English: fluent

Education

- Diploma in Secondary Education: Commerce (TSO) (1997-2003)

  Atheneum Emanuel Hiel

  Charles Gilisquetlaan 34, 1030 Schaarbeek BE

Hobbies

- Sport: badminton

  Club: jet'plume

  Location: Jette

</td></tr>
</table>

Exemplary motivation letter - Type A (English translation)

Dear Sir/Madam,

I would like to express my interest in the open position of [position], which I found through the database of [jobsite]. I have been looking for a new professional challenge for several months now. The content of the job you are offering looks very attractive and seems to match my skills and experience perfectly.

I would like to explain my drive, flexibility, capabilities and work experience during a personal interview. More information about my work experience and education can be found in the attached Curriculum Vitae.

Kind regards,

Thomas Goossens

Exemplary CV - Type B (English translation)

CURRICULUM VITAE

Personal information

First name and last name	Magda Piotrowska
Address	Sint-Martinusgaarde 70, 1083 Ganshoren
Date of birth	9 June 1973
Place of birth	Brussels
Nationality	Belgian
Phone	(0492) 15 10 33
Mailaddress	magda-piotrowska@outlook.com

Profession activities

1991/10 - 2007	Chief warehouse worker, Fsp
2007/11 - 2013	Assistant chef, Collard
2013/3 - …	Chief warehouse worker, Aerts

Education

1985 - 1991	Regina Pacisinstituut
	TSO Commerce
	Brussels

Language skills

	Speaking	Reading	Writing
Ducth	Perfect knowledge	Perfect knowledge	Perfect knowledge
French	Perfect knowledge	Perfect knowledge	Perfect knowledge
English	Good	Good	Good

ICT skills

Perfect knowledge of standard desktop software (Microsoft Office)

Varia

Volleybal - Smash Ganshoren

Mobility

Driving license B

Exemplary motivation letter - Type B (English translation)

Dear Madam

Dear Sir

I have noted with interest your advertisement on the [jobsite] website. I would like to be considered for the position of [position], for which I believe I have the right experience. It is with great enthusiasm that I apply.

You can read my professional experience in my CV. I am happy to further explain my profile in a personal interview.

Yours sincerely

Magda Piotrowska

Appendix C

A common hurdle in correspondence research in the public sector is the low number of observations, as this sector typically comprises a relatively small number of employers. Notwithstanding, these employers often employ a very large number of individuals. Since researchers typically apply to no more than one vacancy from each employer, to limit the burden on the employers and society and to further minimize the chances of the experiment being discovered, the number of observations in the public sector is often too small to make valuable statements about discrimination in this sector.

In our experiment, we bridged this problem through various channels. First, we collected data over an extended period (April 2023-January 2024). Second, we selected all vacancies for all (public) employers with job offers in the Brussels Capital Region (place of employment). The latter implies that we maximise the number of (public) firms we can contact in our experiment. For example, organisations with a head office in the Flemish Region and a branch unit in the Brussels Capital Region could be included in the experiment if the organisation published a vacancy for a job in the Brussels Capital Region (place of employment). Third, under certain conditions, we contacted public organisations for two different vacancies, as opposed to one vacancy in the private sector.

Contacting public employers for two vacancies, likely has little additional cost to public employers and society as a whole, as public organisations often have a much larger employee base than organisations in the private sector. As a result, public organisations typically have multiple HR units responsible for recruitment. Data from the Belgian Social Security Office (Rijksdienst voor Sociale Zekerheid, 2023b) affirms that, on average, public sector branch units employ a significantly higher workforce compared to their counterparts in the private sector and the overall economy, as illustrated in Table C1. Furthermore, besides the costs for individual employers, we also considered the effects on society at large as contacting employers twice increases the probability of detection and possible perverse effects of the experiment. By imposing several conditions, we minimise these potential costs. Specifically, we impose four conditions for applying for a second vacancy with a public employer. First, only public sector employers may be contacted for two vacancies. Second, there must be a minimum of four months between the two contacts. Third, the selected vacancies with the same employer must be for different professions. Fourth, the four applicants (two times two applicants) must have different names.

Table C1. Number of employees per branch unit in Belgium

NACE		<5	5-9	10-19	20-49	50-99	100-199	200-499	500-999	>1000	Total
A. Agriculture, forestry and fishing	N	3 943	706	412	268	66	18	2	-	-	5 415
	%	72.8	13.0	7.6	4.9	1.2	0.3	0.0	0.0	0.0	100
B. Mining and quarrying	N	38	32	24	16	2	5	1	-	-	118
	%	32.2	27.1	20.3	13.6	1.7	4.2	0.8	0.0	0.0	100
C. Manufacturing	N	8 456	3 100	2 245	2 056	774	536	277	92	35	17 571
	%	48.1	17.6	12.8	11.7	4.4	3.1	1.6	0.5	0.2	100
D. Electricity, gas, steam and air conditioning supply	N	96	36	33	34	28	19	20	6	2	274
	%	35.0	13.1	12.0	12.4	10.2	6.9	7.3	2.2	0.7	100
E. Water supply; sewerage; waste management and remediation activities	N	742	246	217	215	96	35	24	3	-	1 578
	%	47.0	15.6	13.8	13.6	6.1	2.2	1.5	0.2	0.0	100
F. Construction	N	22 252	4 502	2 501	1 288	351	145	76	7	2	31 124
	%	71.5	14.5	8.0	4.1	1.1	0.5	0.2	0.0	0.0	100
G. Wholesale and retail trade; repair of motor vehicles and motorcycles	**N**	**45 244**	**12 988**	**6 742**	**3 507**	**887**	**251**	**126**	**17**	**4**	**69 766**
	%	**64.9**	**18.6**	**9.7**	**5.0**	**1.3**	**0.4**	**0.2**	**0.0**	**0.0**	**100**
H. Transportation and storage	N	5 749	2 009	1 405	1 336	464	255	143	24	17	11 402
	%	50.4	17.6	12.3	11.7	4.1	2.2	1.3	0.2	0.1	100
I. Accommodation and food service activities	N	19 592	5 539	2 759	873	110	28	8	1	2	28 912
	%	67.8	19.2	9.5	3.0	0.4	0.1	0.0	0.0	0.0	100
J. Information and communication	N	4 863	1 194	886	658	212	117	59	16	7	8 012
	%	60.7	14.9	11.1	8.2	2.6	1.5	0.7	0.2	0.1	100
K. Financial and insurance activities	N	6 996	1 736	769	390	123	72	40	25	13	10 164
	%	68.8	17.1	7.6	3.8	1.2	0.7	0.4	0.2	0.1	100
L. Real estate activities	N	6 576	548	206	141	41	7	1	-	-	7 520
	%	87.4	7.3	2.7	1.9	0.5	0.1	0.0	0.0	0.0	100
M. Professional, scientific and technical activities	N	17 443	3 370	1 743	1 094	301	170	76	9	7	24 213
	%	72.0	13.9	7.2	4.5	1.2	0.7	0.3	0.0	0.0	100
N. Administrative and support service activities	**N**	**8 724**	**2 272**	**1 600**	**1 915**	**1 284**	**637**	**276**	**53**	**31**	**16 792**
	%	**52.0**	**13.5**	**9.5**	**11.4**	**7.6**	**3.8**	**1.6**	**0.3**	**0.2**	**100**
O. Public administration and defence; compulsory social security	**N**	**1 896**	**961**	**999**	**1 353**	**854**	**464**	**270**	**67**	**37**	**6 901**
	%	**27.5**	**13.9**	**14.5**	**19.6**	**12.4**	**6.7**	**3.9**	**1.0**	**0.5**	**100**
P. Education	N	5 223	2 231	2 441	4 608	1 175	674	120	29	17	16 518
	%	31.6	13.5	14.8	27.9	7.1	4.1	0.7	0.2	0.1	100
Q. Human health and social work activities	N	10 919	2 950	2 649	2 275	1 328	797	279	117	60	21 374
	%	51.1	13.8	12.4	10.6	6.2	3.7	1.3	0.5	0.3	100
R. Arts, entertainment and recreation	N	5 469	1 440	830	404	85	29	14	1	1	8 273
	%	66.1	17.4	10.0	4.9	1.0	0.4	0.2	0.0	0.0	100
S. Other service activities	N	12 540	2 086	906	441	104	37	13	-	-	16 127
	%	77.8	12.9	5.6	2.7	0.6	0.2	0.1	0.0	0.0	100
T. Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	N	4 038	25	-	-	-	-	-	-	-	4 063
	%	99.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100
U. Activities of extraterritorial organisations and bodies	N	190	70	50	28	6	2	1	-	-	347
	%	54.8	20.2	14.4	8.1	1.7	0.6	0.3	0.0	0.0	100
Total	N	190 989	48 041	29 417	22 900	8 291	4 298	1 826	467	235	306 464
	%	62.3	15.7	9.6	7.5	2.7	1.4	0.6	0.2	0.1	100

Source. Rijksdienst voor Sociale Zekerheid (2023b).