

# Is labour market discrimination against ethnic minorities better explained by taste or statistics? A systematic review of the empirical evidence

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## ABSTRACT

To mitigate ethnic labour market discrimination, it is essential to understand its underlying mechanisms because different mechanisms call for different counteracting measures. To this end, we reviewed the recent literature that confronts the theories of taste-based and statistical discrimination against the empirical reality. Whereas the empirical evidence for both mechanisms is generally mixed, (field) experimental research, which predominantly focuses on hiring outcomes, appears to yield proportionately more evidence in favour of taste-based discrimination vis-à-vis statistical discrimination. This finding suggests that the taste-based mechanism may better explain ethnic discrimination in hiring. However, we also observe that the measurement operationalisations of the mechanisms vary substantially between studies and that alternative theoretical interpretations of some of the evidence are plausible. Taken together, additional research efforts, using clear measurement standards and appropriate synthesis methods, are required to solidify the review's main finding.

## ARTICLE HISTORY

Received 9 September 2021  
Accepted 2 March 2022

## KEYWORDS

Taste-based discrimination;  
statistical discrimination;  
ethnicity; labour market;  
systematic review

## 1. Introduction

Ethnic labour market discrimination per definition implies the disadvantageous, differential treatment of minority group members based on their ethnic characteristics (Blank, Dabady, and Citro 2004; Gaddis 2018). Both employees and employers face the negative consequences of this discrimination. On the one hand, minority employees repeatedly experience unfavourable treatment when applying for a job and are often remunerated worse than their majority counterparts (Altonji and Pierret 2001; Baert 2018; Barr and Oduro 2002; Charles and Guryan 2008; Epstein, Gafni, and Siniver 2016; Lippens, Vermeiren, and Baert 2021). As a consequence, they are less likely to be satisfied with their job or committed to the organisation they work for, and are

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more prone to experiencing mental and physical health issues (Paradies et al. 2015; Pascoe and Smart Richman 2009; Triana, Jayasinghe, and Pieper 2015). On the other hand, employers who engage in discriminatory hiring practices are, according to a recent study, more likely to go out of business in the medium term (Pager 2016).

Understanding the underlying mechanisms of (ethnic) labour market discrimination is key to developing appropriate policies to mitigate its prevalence (Neumark 2018). In this review, we synthesise the empirical evidence regarding the two leading economic mechanisms of ethnic labour market discrimination: the taste-based mechanism and the statistical mechanism (Guryan and Charles 2013; Lang and Kahn-Lang Spitzer 2020; Neumark 2018). In the next paragraphs, we (i) elaborate on the theories of taste-based and statistical discrimination, (ii) discuss alternative theoretical angles, and (iii) highlight the position of our work within the labour market discrimination literature and our research goals.

### ***1.1. Economic mechanisms of labour market discrimination***

Historically, economists have described and explained labour market discrimination by two leading mechanisms: taste-based discrimination and statistical discrimination (Guryan and Charles 2013; Lang and Kahn-Lang Spitzer 2020; Neumark 2018). On the one hand, the taste-based mechanism focuses on an economically irrational, subjective animosity expressed by (ethnic) majorities towards (ethnic) minorities (Becker 1957, 1971). On the other hand, the statistical mechanism focuses on the economically rational, objective reaction of employers to information asymmetry (Aigner and Cain 1977; Arrow 1973; Phelps 1972). Recently, the debate on whether the taste-based or the statistical mechanism better explains discrimination has returned to its roots (Guryan and Charles 2013). To date, it remains ambiguous whether one of these mechanisms prevails.

#### ***1.1.1. Taste-based discrimination***

Becker's (1971) model of taste-based discrimination reflects individual prejudice related to contact preferences. This occurs when members of the majority group (e.g. Whites) have personal preferences to have contact with members of the same group over members of the minority group (e.g. Blacks). Applying this principle to a prejudiced White employer, this employer chooses to hire White employees over Black employees simply because of their prejudice against Black employees. This animosity can be so strong that employers are willing to pay a certain price to avoid contact with members of the minority out-group (Becker 1971; Hedegaard and Tyran 2018). Consequently, discriminating White employers pay too high wages for employing White employees, decreasing firm profits in the long term. Moreover, the theory of taste-based discrimination posits that discrimination (i) increases with social, socioeconomic, or physical distance; (ii) is positively moderated by the prominence of the minority traits (i.e. ethnic salience), and (iii) increases if competitive market forces (which drive down profitability) are weak or absent (Becker 1971; Lang and Kahn-Lang Spitzer 2020).

The taste-based discrimination mechanism adopts three distinct yet closely related forms (Becker 1971; Borjas 2020). First, employer discrimination involves an employer experiencing animosity or distaste from employing a minority employee as the perceived cost associated with hiring this employee exceeds the perceived cost of hiring an equally

productive employee from the majority group. Second, employee discrimination relates to majority employees experiencing distaste (e.g. the perception of lower wages) from working alongside minority colleagues. Third, customer discrimination entails customers experiencing distaste (e.g. the perception of higher prices for goods and services) from interacting with minority employees. Employee and customer discrimination might, in turn, result in employer discrimination because of the sensitivity of employers, i.e. in terms of economic losses, to the experienced distaste of their personnel and customers (see e.g. Combes et al. 2016; Laouénan 2017).

An evident measure to counter taste-based discrimination, from an economic perspective, is increasing the penalty to individuals who discriminate (Hedegaard and Tyran 2018). Considering the case of the discriminating employee, this employee presumably associates a perceived cost with collaborating with minority colleagues (Becker 1971; Borjas 2020). The height of this cost dictates how much the employee is willing to forego to exclusively work together with majority colleagues. Penalising taste-based discriminators for choosing majority over minority colleagues consequently neutralises the perceived cost associated with collaborating or interacting with minority co-workers (Borjas 2020; Neumark 2018). This mechanism has been empirically demonstrated by Hedegaard and Tyran (2018) and Lippens, Baert, and Derous (2021), who found that (i) some individuals were willing to give up some amount of wage to avoid collaborating with colleagues of different ethnicity and (ii) discrimination against these colleagues was reduced when a financial penalty linked to discriminatory conduct was introduced.

### 1.1.2. *Statistical discrimination*

The statistical discrimination mechanism is based on the notion of statistical inference due to information ambiguity (Aigner and Cain 1977; Arrow 1973; Phelps 1972). Here, the employer relies on group-level productivity information to estimate the productivity of an individual employee in the absence of perfect information about the true productivity of that employee (Aigner and Cain 1977; Arrow 1973; Lang and Kahn-Lang Spitzer 2020; Phelps 1972). This absence arises because only limited information about the employee's productivity is known or because the known information is imprecise (Borjas 2020). Although a viable solution might be to collect more (precise) information about the employee, it could be outweighed by the excessive costs that come with information acquisition (Arrow 1973; Phelps 1972). Consequently, employers could attribute unfavourable group-level information to minority candidates, creating unequal labour market outcomes. Examples of such statistical inference include the attribution of lower language competency, lower educational attainment, or unproductive personality characteristics to ethnic minority candidates (see e.g. Carlsson 2010; Kaas and Manger 2012).

A logical counter-response to statistical discrimination is issuing interventions that increase the quantity and reliability of information about the productivity-related characteristics of the employee, therefore diminishing information ambiguity (e.g. in the form of academic transcripts or test certificates; Neumark 2018). This decreases the assessment needs and related costs for employers, thus lowering their urge to fall back on group characteristics to estimate employee productivity. Compared to taste-based discriminators, it makes less sense to financially penalise employers who discriminate based on

statistical beliefs. This is because even if their discriminatory behaviour is penalised, it would still be economically rational to make productivity estimations based on group averages. Only if their internalised beliefs are refuted or if they acquire more (accurate) individual-level productivity information, their discriminatory behaviour could become no longer economically justifiable.

To date, the empirical literature has mainly focused on statistical discrimination based on accurate statistical inference (Bohren et al. 2019). However, although it might be economically rational (but unlawful or undesirable) to discriminate based on accurate group-level information, statistical discrimination could also reflect erroneous, inaccurate beliefs (Bohren et al. 2019; Lang and Kahn-Lang Spitzer 2020). The extent to which the employer updates erroneous or previously accurate but currently inaccurate beliefs by more accurate knowledge is sometimes referred to as ‘employer learning’ (Altonji 2005; Altonji and Pierret 2001; Lang and Lehmann 2012). Because of the very limited empirical research on inaccurate statistical discrimination, it is not discussed further in this review. Nevertheless, it constitutes an important alternative interpretation of statistical discrimination; previous studies might have overly relied on the unaffirmed accuracy of statistical beliefs (Bohren et al. 2019).

## 1.2. Alternative theories of labour market discrimination

We are aware that there are alternative approaches to explaining labour market discrimination, notably outside the field of economics (Deros and Ryan 2019; Fibbi, Midtbøen, and Simon 2021). In psychology, individual-level theories—i.e. theories of racism, contact theory, personality-based theories, theories of social identity, relational demography theory, and stereotype models—dominate the field (Allport 1954; Deros and Ryan 2019; Fiske et al. 2002; Hogg 2016; Pettigrew and Tropp 2006; Tajfel and Turner 1979; Tsui and O’reilly 1989). In sociology, there is a more distinct focus on organisation- and structural-level theories—the former includes models concerning the formalisation of organisational procedures, the reproduced inequalities of internal networks, and the societal mechanisms related to regulatory frameworks (Dobbin and Kalev 2013; Dobbin, Schrage, and Kalev 2015; Fibbi, Midtbøen, and Simon 2021; Midtbøen 2015; Pager and Shepherd 2008; Small and Pager 2020). In what follows, we discuss some of the associations between the taste-based and statistical discrimination mechanisms and other individual- and organisational-level theories.

In *The economics of discrimination*, Becker (1957) distinctly draws on Allport’s (1954) *The nature of prejudice*, relying on the proposition that taste-based discriminators avoid contact with ethnic minorities because of the animosity this contact incites (Becker 1971). The affective component of contact aversion that underlies taste-based discrimination has been worked out in more detail in individual-level theories such as aversive racism theory, social identity theory, and intergroup contact theory (Allport 1954; Hogg 2016; Pettigrew and Tropp 2006; Tajfel and Turner 1979). Social identity theory, for example, stresses individuals’ preferences for peers with whom these individuals can identify themselves better, positively improving their own social identity (i.e. in-group favouritism; Hogg 2016). Considering taste-based discrimination, this resonates with the hypotheses that (i) ethnic salience positively moderates discrimination and that (ii) discrimination increases with social or cultural distance (Becker 1971; Lang

and Kahn-Lang Spitzer 2020). Furthermore, intergroup contact theory argues that contact between members from in- and out-groups may instigate discrimination and only results in less prejudice under certain conditions (Allport 1954; Pettigrew and Tropp 2006). However, evidence from a recent review suggested that increased contact could unconditionally reduce prejudice (Pettigrew et al. 2011).

Conversely, statistical discrimination is more closely related to stereotype-based theories, like the stereotype content model or the theory of error discrimination (Arrow 1973; England and Lewin 1989; Fiske et al. 2002; Phelps 1972). According to the stereotype content model, stereotypes—i.e. cognitive beliefs individuals have about others based on their social group membership—fall along two dimensions: competence (driven by status) and warmth (driven by competition; Fiske et al. 2002). The resemblance to statistical discrimination is that both theories argue that these beliefs are used to infer individual-level characteristics in the absence of perfect information. The key difference, however, is that stereotypes are often erroneous and unsuccessful in predicting individual behaviour (e.g. error discrimination), while early theoretical work concerning statistical discrimination assumed that the statistical inference was generally accurate (Arrow 1973; England and Lewin 1989; Phelps 1972). Present work in economics refers to this form of discrimination based on erroneous beliefs as inaccurate statistical discrimination (Bohren et al. 2019; Lang and Kahn-Lang Spitzer 2020).

Aside from explicit, conscious forms of prejudice and stereotyping, psychologists and sociologists have also examined more implicit, unconscious forms, which have been partially adopted in economic research (Greenwald, McGhee, and Schwartz 1998, 2015; Lang and Kahn-Lang Spitzer 2020; Neumark 2018; Pager and Shepherd 2008; Small and Pager 2020). Bertrand and colleagues (2005), for example, reinterpreted the evidence of Bertrand and Mullainathan (2004) in terms of implicit discrimination, arguing that the uncovered discrimination might have been more unintentional than was previously presumed. A more empirically substantiated example is the study of Rooth (2010), who linked automatic associations (as measured by an implicit association test) with discriminatory behaviour (as measured in a correspondence experiment). Even though there is an ongoing debate regarding the psychometric validity of implicit association tests, scholars have continued their efforts to examine the relationship between implicit associations and prejudice or discrimination (Blommaert, van Tubergen, and Coenders 2012; Deros, Nguyen, and Ryan 2009; Greenwald, Banaji, and Nosek 2015; Oswald et al. 2013; Rooth 2010).

Considering organisational-level theories, it is difficult to establish clear associations with taste-based and statistical discrimination theories because these theories operate at different levels (i.e. micro versus meso) and are not necessarily based on interchangeable mechanisms (i.e. prejudice and stereotypes versus organisational structures, dynamics, and rules; Fibbi, Midtbøen, and Simon 2021). However, we see two links. On the one hand, activated internal networks in organisations could facilitate in-group favouritism, preserving existing inequalities in the labour market (DiMaggio and Garip 2012; Fibbi, Midtbøen, and Simon 2021). A concrete example of this is that, through referral programmes, dominant groups in the labour market might favour peers with similar ascriptive characteristics, ultimately disadvantaging minority group members (DiMaggio and Garip 2012). At the individual level, this effect could be reinforced by taste-based discriminators, who have distinct contact preferences for in-

group colleagues, contributing to the overall detrimental effect of the activated internal networks. On the other hand, the formalisation of organisational procedures is theorised to counter discrimination as it eliminates some of the bias incorporated in individual-level decision making (Dobbin, Schrage, and Kalev 2015; Fibbi, Midtbøen, and Simon 2021). Sharply delineated recruitment procedures within a firm, for example, might force recruiters to acquire more (relevant) information about job candidates, suppressing the activation of statistical beliefs about these candidates.<sup>1</sup> If such formalised organisational procedures are internalised, this could influence whether individual recruiters fall back on group-level productivity characteristics to infer the productivity of job candidates and, thus, whether they statistically discriminate.

### 1.3. *The current study*

Following the seminal works of Becker (1957), Phelps (1972), and Arrow (1973), researchers have shown great interest in measuring the incidence of labour market discrimination (Gaddis 2018). Only since the early 2000s, however, research has redirected its focus from measuring the unequal treatment of minorities in the labour market towards uncovering the mechanisms behind this discrimination (Gaddis 2018; Guryan and Charles 2013). Several recent studies have charted the literature regarding (ethnic) labour market discrimination and subjected it to thorough review (e.g. Baert 2018; Bertrand and Duflo 2016; Heath and Di Stasio 2019; Lane 2016; Lang and Lehmann 2012; Neumark 2018; Quillian et al. 2019; Rich 2014; Zschirnt and Ruedin 2016). Collectively, these reviews have surveyed the empirical evidence and the methods by which labour market discrimination has been measured. Some of these studies, in minor order, have also elaborated on the empirical relevance of the economic mechanisms of discrimination without reaching consistent conclusions (e.g. Lane 2016; Rich 2014; Zschirnt and Ruedin 2016). However, to date, no study has attempted to systematically compose an overview of research focusing on the quantitative, empirical evidence related to the leading economic mechanisms of ethnic labour market discrimination.

The aim of the current study is threefold. Our first ambition is to survey the existing research that quantitatively assesses the empirical evidence regarding taste-based and statistical labour market discrimination on the grounds of ethnicity. Our second objective is to evaluate how the findings contextually differ concerning labour market outcome, region, minority classification, and research design. Our third goal is to more closely and critically examine how the mechanisms of discrimination are measured in the selection of retained studies. In addition, we provide some alternative explanations to the findings based on the studies' methods and the insights from theories outside the field of economics. By addressing these aims, we aspire to provide answers from an economic frame of reference to the 'why' of ethnic labour market discrimination and, therefore, identify how it can be counteracted.

## 2. *Methods*

In the following subsections, we describe (i) the eligibility criteria, (ii) the search strategy, including the consulted information sources, and (iii) the process of selecting eligible studies.



## 2.1. Eligibility criteria

Table 1 provides an overview of the eligibility criteria used to refine the selection of studies included in this review. We adopted the SPIDER-framework (Sample, Phenomenon of Interest, Design, Evaluation, Research type) for research retrieval and evaluation (Cooke, Smith, and Booth 2012). This systematic search strategy framework focuses on qualitative review questions and mixed methods research—both apply to our study. To satisfy the aims outlined in the introduction, we adhered to the following standards: (i) the ‘Sample’ criterion was limited to ethnic and racial minorities; (ii) the ‘Phenomenon of Interest’ criterion was restricted to taste-based and statistical discrimination; (iii) the ‘Design’ and ‘Research type’ criteria were limited to primary, quantitatively-oriented empirical studies; and (iv) the ‘Evaluation’ criterion was restricted to labour market outcomes (e.g. hiring, promotion, firing). Moreover, we only included peer-reviewed articles written in English that were published between 2000—the period when research increasingly reoriented its focus towards uncovering the mechanisms of labour market discrimination—and 2019—the most recent full calendar year at the time of the data collection (Gaddis 2018).

## 2.2. Search strategy

We conducted multiple systematic, electronic searches using relevant, predefined search terms related to taste-based and statistical discrimination. First, a basic search was executed on the database Web of Science with a combination of the following keywords: (i) ‘taste(-based)’, ‘preference(-based)’, ‘employer’, ‘employee’, ‘customer’, or ‘statistical’; (ii) ‘discrimination’ or ‘prejudice’; and (iii) ‘ethnicity’, ‘race’, ‘ethnic’, or ‘racial’. Second, a cited reference search was performed, also on Web of Science, on the seminal works of Becker (1957, 1971), Arrow (1972, 1973), Aigner and Cain (1977) and Phelps (1972) using the same keywords to filter relevant results.<sup>2</sup> For all searches on Web of Science, we a posteriori excluded categories from which we expected no relevant results to appear, maintaining our focus on research from the social sciences. These were the categories related to arts and humanities, life sciences and biomedicine (except for the subcategory ‘behavioural sciences’), physical sciences, and technology. Third, while screening the full texts of the selected studies, we paid special attention to the literature which we potentially did not identify in the previous steps. To this end,

**Table 1.** Eligibility criteria of the systematic review.

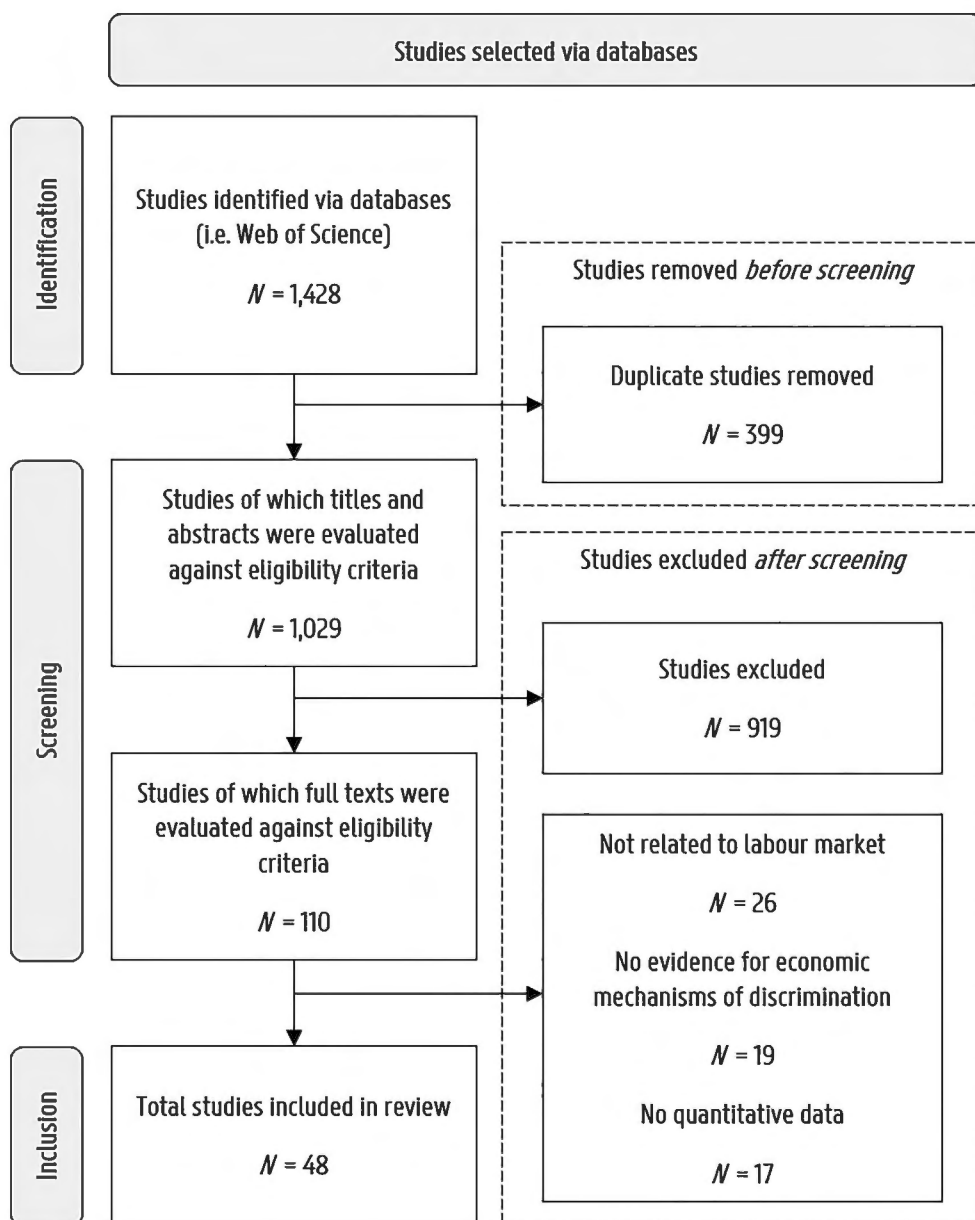
(1) Criterion	(2) Description
Sample	I: Ethnic/racial minorities (in comparison with ethnic/racial majorities). E: Minorities who are discriminated against based on other (legal) grounds than ethnicity or race.
Phenomenon of Interest	I: The economic mechanisms of labour market discrimination that are most firmly rooted in economic theory: taste-based discrimination and statistical discrimination. E: Other, (non-)economic mechanisms and theories of discrimination.
Design	I: (Quasi-)experiments, field experiments and (regression-based) correlational research. E: meta-analyses, (systematic) reviews, case studies, interview-type studies and theoretical papers.
Evaluation (Outcome)	I: Differential treatment in terms of labour market outcomes, such as employment, employee productivity, remuneration, work conditions and outplacement. E: Studies that solely focus on outcomes related to other markets, such as the product, service, retail or real estate market.
Research type	I: Primary, quantitative, empirical research (including mixed methods). E: Secondary and qualitative research.

Notes: ‘I’ denotes ‘inclusion’. ‘E’ denotes ‘exclusion’. The SPIDER-framework presented in this table is based on Cooke and colleagues (2012).

we used the ‘snowball method’, where the full text was our starting point from which relevant citations were extracted.

### 2.3. Study selection

Figure 1 provides an overview of the study selection process. First, we excluded all duplicate records from the various searches, resulting in 1,029 articles. Second, the titles and



**Figure 1.** Flow chart of the study selection.

Notes: This figure is adapted from Page et al. (2021, 5).



abstracts (including keywords) were evaluated against the eligibility criteria. In total, 919 studies were excluded in the second step, resulting in a subtotal of 110 research papers. Third, the full texts were assessed based on the eligibility criteria—48 articles were eventually retained. In 62 cases, not all criteria were met, and the respective articles were excluded. The criteria on the basis of which full texts were excluded were: (i) not related to labour market ( $N = 26$ , 41.94%); (ii) no evidence for economic mechanisms of discrimination ( $N = 19$ , 30.65%); and (iii) not quantitative research ( $N = 17$ , 27.42%). Finally, we invited the corresponding author of each of the selected studies to validate the interpretation and classification (in terms of evidence of taste-based and statistical discrimination) of their findings. About half of the contacted authors ( $N = 27$ , out of 46; 58.70%) eventually provided us with feedback.<sup>3</sup>

Because of the large pool of studies to assess, a secondary reviewer performed an additional, independent evaluation after completion of the third step of the study selection. This evaluation consisted of evaluating the title and the abstract of each sampled study and (re-)evaluating the full texts of the resulting selection against the eligibility criteria. The product of this review process was an inter-rater-reliability (IRR) estimate that captures the consensus between the primary and secondary reviewers concerning the selection decisions. To this end, we drew a random sample of 55 studies. We obtained an IRR estimate of .85 with an associated Kappa, a measure of inter-rater agreement correcting for chance, of .71. Based on the classification of Landis and Koch (1977), the latter can be viewed as a substantial agreement between the raters. Between-rater disagreement was resolved (and a consensus was reached) by a joint re-evaluation of the disputed papers. Following this process, the full texts of the remaining half of the papers identified after the second step of the study selection were also reassessed based on the refined eligibility criteria.

### 3. Results

In the following subsections, we present and discuss the findings of our review. First, we provide a general overview of the empirical evidence of taste-based versus statistical discrimination. Second, we describe the contextual differences of the empirical evidence by labour market outcome, region, minority classification, and research design. Third, we critically assess how the taste-based and statistical discrimination mechanisms are measured in the selected literature and discuss alternative (theoretical) interpretations of the evidence presented.

#### 3.1. An overview of the empirical evidence

Table 2 provides an overview of the literature assessing the empirical evidence of taste-based and statistical labour market discrimination based on ethnicity. In addition, Figure 2 presents a visual comparison of the evidence regarding the mechanisms. Relying on vote counts, we observe that 30 out of the 48 included studies (62.50%) report empirical evidence about taste-based discrimination, of which 20 support the mechanism (out of 30; 66.67%), 8 oppose the mechanism (26.67%), and 2 report mixed evidence (6.67%)—the latter means that both evidence for and against the mechanism is found within the same study. Comparably, 34 studies (70.83%) include empirical evidence

**Table 2.** Overview of the literature evaluating the empirical evidence of ethnic taste-based and statistical labour market discrimination (N = 48).

(1) Author(s) (year)	(2) Region (country)	(3) Minority (majority)	(4) Research design	(5) Main findings related to the mechanisms
<i>A. Employment</i>				
Aeberhardt, Coudin, and Rathelot (2017)	Western Europe (France)	3,626 French males with parents of North African descent (79,055 native French males)	Correlational (cross-sectional)	The results indicate that hiring rates rise with observed worker qualifications (employability) and decrease upon reaching a certain threshold, which matches the predictions of a static model of statistical discrimination. In addition, exit rates increase with employability and vary based on ethnicity. This ethnic disparity in exit rates presumably occurs if the variance of the screening error (i.e. a 'noisier' signal) differs across ethnic groups. Both findings provide evidence in favour of <b>statistical discrimination (+)</b> .
Agan and Starr (2018)	North America (United States of America)	7,320 fictitious Black applicants (7,320 White applicants)	Experimental (field)	The results show that ban-the-box measures in the USA substantially decrease employer call-back for Black applicants vis-à-vis White applicants. Because employers no longer possess information about the applicants' criminal history, they are forced to rely on (minority) group-level information, which is detrimental for Black applicants. This is evidence in line with <b>statistical discrimination (+)</b> . <sup>m</sup>
Asali, Pignatti, and Skhirtladze (2018)	Eastern Europe (Georgia)	1,100 fictitious Azerbaijani and Armenian applicants (1,100 Georgian applicants)	Experimental (field)	Georgian applicants are more than twice as likely to be called back for a job interview than equally skilled Azerbaijani or Armenian applicants. Furthermore, the results indicate that this discrimination tends to increase during economic busts as labour demand decreases. This is in line with predictions from <b>taste-based discrimination (+)</b> . <sup>n</sup>
Åslund and Rooth (2005)	Northern Europe (Sweden)	Middle Eastern immigrants (other immigrants with an ethnic background different from the minority group and native Swedes) <sup>3</sup>	Correlational (panel)	Due to the 9/11 terrorist attacks which took place in the USA, the authors expected deterioration of employment perspectives for immigrants as a consequence of increased negative attitudes towards them. Although the results indicate that there is evidence of a change in attitudes, they do not show said effect exists and thus contradict <b>taste-based discrimination (–)</b> as a possible explanation for discrimination.
Baert and De Pauw (2014)	Western Europe (Belgium)	139 fictitious applicants with a Turkish-sounding name (139 applicants with a Flemish-sounding name)	Experimental (lab, incl. survey data)	The findings indicate that views related to the mechanism of taste-based discrimination mediate the relationship between the applicant being of non-native origin and an invitation to a job interview. The overall mediation effect is negative, which provides evidence for the presence of <b>taste-based discrimination (+)</b> . This does not hold for attitudes related to the mechanism of <b>statistical discrimination (–)</b> , for which no effect is found.
Baert et al. (2017)	Western Europe (Belgium)	384 fictitious applicants with a Turkish, Moroccan, Slovakian or Ghanaian name (384 applicants with a Flemish-sounding name)	Experimental (field)	The results show that work experience lowers hiring discrimination against immigrants. Because more information about the actual productivity of a job candidate increases with work experience (i.e. decreased information asymmetry) negatively relates to the uncovered discrimination, these results are in line with <b>statistical discrimination (+)</b> .
Baert et al. (2018)	Western Europe (Belgium)	337 fictitious applicants with a Turkish, Moroccan, Slovakian or Ghanaian name (337 applicants with a Flemish-sounding name)	Experimental (field, incl. administrative data)	The findings provide evidence against <b>statistical discrimination (–)</b> and <b>taste-based discrimination (–)</b> . On the one hand, from the perspective of statistical discrimination, larger firms potentially discriminate less than smaller firms, as they have a dedicated, formalised human resources department, greater capacity to process applications, and hence possess more accurate information of job applicants. On the other hand, taste-based discrimination suggests that unequal treatment based on prejudice should yield worse firm financial health. The results show no significant relationship between firm size or financial health and hiring discrimination.
Bartoš et al. (2016)	Central Europe (Czech Republic, Germany)	653 fictitious candidates with an Asian or Roma name (640 candidates with a native-sounding name)	Experimental (field)	The results indicate that employers discriminate due to a lack of attention to certain information or 'willingness to process information', and hence choose to pay less attention to applications from minorities (i.e. attention discrimination). This, in turn, relates to statistical discrimination as information asymmetry is detrimental to the hiring chances of minorities. The authors argue that the evidence is in line with <b>statistical discrimination (+)</b> but that the mechanism cannot fully explain the lack of attention.

Bertrand and Mullainathan (2004)	North America (United States of America)	2,435 fictitious Black applicants (2,435 White applicants)	Experimental (field)	The results indicate that there is no evidence that discrimination is higher for jobs requiring greater communication skills vis-à-vis customers and co-workers, which contradicts <b>taste-based discrimination</b> (—). Discrimination levels also do not increase when credentials become more apparent, hence <b>statistical discrimination</b> (—) is unlikely to explain the call-back rate differentials. The authors argue that alternative models may better explain their findings.
Blommaert, Coenders, and Tubergen (2014)	Western Europe (Netherlands)	318 fictitious Arabic-named applicants (318 Dutch-named applicants)	Experimental (field)	On the one hand, the results show that Arabic-named applicants experience substantial discrimination in the first 'view' phase of selection, in which employers decide on which candidates' full resumé to view. On the other hand, controlling for the number of views, discrimination decreases in the second 'call-back' phase. However, the degree of discrimination does not vary across occupational levels and sectors, and ethnic minorities do not receive lower returns to informative, observable, productivity-related characteristics than majority group members. This is evidence against <b>statistical discrimination</b> (—).
Boyd-Swan and Herbst (2019)	North America (United States of America)	Fictitious applicants with Black- and Hispanic-sounding names (applicants with White-sounding names) <sup>b</sup>	Experimental (field)	The results indicate that neighbourhood racial and ethnic shares (i.e. a proxy for customer discrimination) correlate with teacher hiring decisions in child care centres, benefiting applicant-teachers in neighbourhoods where their own ethnicity is more strongly represented (i.e. ethnic homophily). This is evidence in favour of <b>taste-based discrimination</b> (+).
Bryson and Chevalier (2015)	Western Europe (United Kingdom)	642 non-White Fantasy Football players (1,125 White Fantasy Football players)	Quasi-experimental (field)	The results provide little evidence for racial discrimination in the virtual labour market of Fantasy Football. The virtual labour market setting rules out <b>taste-based discrimination</b> (—) since the players do not physically play together (there is no interaction), the employers have no customers and most endogenous and exogenous factors are identical by design. Furthermore, employers have perfect knowledge of the Fantasy Football players' labour productivity. However, the results do show discrimination in hiring and firing of new players for whom, exceptionally, no productivity information is available at the start of the football season, hinting that <b>statistical discrimination</b> (+) might be at play.
Busetta, Campolo, and Panarello (2018)	Southern Europe (Italy)	20,000 fictitious first- and second-generation immigrants with an ethnic background (2,000 native Italians)	Experimental (field)	First-generation immigrants are presumed to be less integrated into society than second-generation immigrants due to being viewed as less proficient in Italian and less educated. Notwithstanding the hypothesised language proficiency differences, the results show that there is no significant difference in the hiring chances of first- and second-generation immigrants in Italy. These findings contradict <b>statistical discrimination</b> (—). Alternatively, the authors suggest that the most valid explanation for the uncovered discrimination is <b>taste-based discrimination</b> (+).
Carlsson (2010)	Northern Europe (Sweden)	1,295 fictitious first-generation and 1,337 s-generation Middle Eastern immigrant applicants (1,329 native Swedes)	Experimental (field)	The results indicate that first- and second-generation immigrants have essentially the same probability of being invited to a job interview. This suggests that minority applicants with a Middle Eastern background are discriminated against because of their ethnicity. This is evidence in line with <b>taste-based discrimination</b> (+) and contradicts <b>statistical discrimination</b> (—). Yet, the results also indicate that employment agencies are more likely to invite minority candidates than other firms, potentially because of better assessment procedures and/or compliance with anti-discrimination legislation. This is evidence in favour of <b>statistical discrimination</b> (+).
Carlsson and Rooth (2012)	Northern Europe (Sweden)	2,820 fictitious applicants with a typical Middle Eastern name (2,837 applicants with a typical Swedish name)	Experimental (field, incl. administrative data)	The results show that applicants with a Middle Eastern name are discriminated against to a larger extent than applicants with a typically Swedish name in municipalities where people, on average, have more negative attitudes towards immigrants—this effect is greater for low-skilled occupations. These results are evidence in favour of <b>taste-based discrimination</b> (+).
Combes et al. (2016)	Western Europe (France)	137,801 African immigrants (3,169,975 French natives)	Correlational (cross-sectional)	The results show that African immigrants are underrepresented in jobs that require a substantial amount of customer contact in the French labour market and that this

(Continued)

Table 2. Continued.

(1) Author(s) (year)	(2) Region (country)	(3) Minority (majority)	(4) Research design	(5) Main findings related to the mechanisms
Edo, Jacquemet, and Yannelis (2019)	Western Europe (France)	2,012 fictitious applicants with North African- and other foreign-sounding names (1,006 applicants with French-sounding names)	Experimental (field)	discrimination is linked with customer behaviour. This evidence is in line with <b>taste-based discrimination (+)</b> , and more specifically customer discrimination. The results suggest that hiring discrimination against ethnic minorities as well as ethnic homophily (by natives and females) in hiring practices exists in the French labour market. The latter is evidence in favour of <b>taste-based discrimination (+)</b> . The results also show that differences in call-back become statistically insignificant for non-French females when additional information (i.e. inclusion signals) is provided, yet this does not affect discrimination against non-French males. Given the intersectionality with gender, the results thus provide partial evidence with regard to <b>statistical discrimination (+)</b> .
Horvath and Huber (2019)	European Union (various EU countries)	388,820 recent immigrants in the EU and 719,388 established immigrants in the EU (N/A)	Correlational (cross-sectional)	The results support the premise that regional ethnic diversity positively impacts the employment perspectives of immigrants. This effect is stronger for high-skilled immigrants than low-skilled immigrants as well as for recent immigrants than for established immigrants. This is evidence in favour of <b>statistical discrimination (+)</b> because information asymmetry presumably decreases in ethnically diverse regions, positively impacting employment rates.
Kaas and Manger (2012)	Central Europe (Germany)	528 fictitious internship candidates with Turkish-sounding name (528 fictitious internship candidates with German-sounding name)	Experimental (field)	The findings of a correspondence test suggest that an employer's call-back is significantly lower for applicants with a Turkish-sounding name than for applicants with a German-sounding name. The call-back rate increases (and the difference becomes insignificant) when applications of candidates with a Turkish-sounding name are accompanied by a reference letter stating additional favourable information about the candidate's personality. Overall, these results provide evidence for <b>statistical discrimination (+)</b> .
Koopmans, Veit, and Yemane (2017)	Central Europe (Germany)	5,819 fictitious German ethnic minority candidates of Turkish, Bosnian, Polish, Russian or Italian descent, amongst others (5,819 German natives)	Experimental (field)	On the one hand, the results indicate that the greater the cultural value distance (from the majority culture), the higher the rate of hiring discrimination against ethnic minorities. On the other hand, the results fail to confirm that average group levels of education explain the group differences in call-back ratios: when value distance patterns are controlled for, discrimination is no longer statistically significant. This evidence is in favour of <b>taste-based discrimination (+)</b> but against <b>statistical discrimination (-)</b> .
Laouénan (2017)	North America (United States of America)	African-Americans (White natives) <sup>c</sup>	Correlational (cross-sectional)	The results indicate that African-Americans are discriminated against in the USA labour market in terms of overall employment opportunities and opportunities to attain jobs with high customer contact. This is evidence in favour of <b>taste-based discrimination (+)</b> and, more specifically, customer discrimination.
Longley (2003)	North America (United States of America, Canada)	French Canadians (English Canadians and Americans) <sup>d</sup>	Correlational (panel)	The results show that French Canadians are less likely to be employed by an NHL team based in English Canada than an NHL team based in the United States. The author argues that the difference in team location (English Canada vs. the USA) is a proxy for fan prejudice and that its relation to the representation of French Canadians on a team is evidence for customer discrimination. The results support the customer discrimination hypothesis; hence, they provide evidence in favour of <b>taste-based discrimination (+)</b> .
McGinnity and Lunn (2011)	Western Europe (Ireland)	240 fictitious candidates with African, Asian or German names (240 candidates with Irish names)	Experimental (field)	Candidates with Irish-sounding names are over twice as likely to be called back for an interview vis-à-vis candidates with an African-, Asian- or German-sounding name. The authors argue that, because discrimination does not increase in sales jobs where levels of customer contact are higher than in other jobs (implying customer discrimination) or lower in accountancy jobs for which formal qualifications are presumably more important than for other jobs (implying statistical discrimination), neither <b>taste-based discrimination (-)</b> nor <b>statistical discrimination (-)</b> explain the discriminatory conduct.
Nunley et al. (2016)	North America (United States of America)	4,698 fictitious Black applicants (4,698 fictitious White applicants)	Experimental (field)	The results indicate that Black-named applicants are less likely than White-named applicants to receive interview requests from employers. Moreover, the results show that the racial gap in employment opportunities widens with perceived productivity characteristics (business degree, internship, in-field experience) and that the

Oreopoulos (2011)	North America (Canada)	9,884 fictitious candidates with Indian, Pakistani, Chinese or Greek names (3,026 candidates with English names)	Experimental (field)	<p>differential treatment by race is greater for jobs that require customer interaction. The former contradicts <b>statistical discrimination</b> (–); the latter is evidence in favour of <b>taste-based discrimination</b> (+) and, more specifically, customer discrimination.</p> <p>The author argues that, under the model of statistical discrimination, the impact of listing language fluency is greater for applicants with an ethnic background than for natives. However, the findings suggest that recruiters do not behave consistently, which is evidence against <b>statistical discrimination</b> (–), because they attribute their discriminatory behaviour to language skill concerns but fail to fully account for offsetting features when listed.</p>
Ritter and Taylor (2011)	North America (United States of America)	Black and Hispanic workers (White workers) <sup>e</sup>	Correlational (panel)	<p>The results, presented in an agency-based model of unemployment, show that Black and, to a lesser extent, Hispanic workers experience higher lifetime unemployment than White workers with similar (pre-market) skills. The authors suggest that day-to-day work-related miscommunication might explain the higher unemployment for minority workers, for which they provide some direct evidence. The results hint at workplace segregation, which can be viewed as evidence for <b>taste-based discrimination</b> (+).</p>
Uggen et al. (2014)	North America (United States of America)	153 fictitious African-American applicants (147 White applicants)	Experimental (field)	<p>The results show that African-Americans are called back less frequently by employers, especially when reporting a misdemeanour arrest during the hiring process. Furthermore, the results indicate that personal contact with applicants has a strong positive effect on call-back rates. The authors suggest that, in the absence of contact, employers erroneously attribute lower productivity to minority applicants, while the additional information they receive when interacting with them decreases discriminatory conduct. The results are interpreted as evidence for <b>statistical discrimination</b> (+).</p>
Vernby and Dancygier (2019)	Northern Europe (Sweden)	1,492 fictitious Polish, Iraqi and Somali candidates (1,492 Swedish candidates)	Experimental (field)	<p>The authors make use of ethnocultural distance vis-à-vis Swedish nationals as a proxy for racial prejudice. The findings indicate that call-back rates for candidates with an ethnic background decline with increased distance across minority groups, especially if the candidates are male. This is evidence in favour of <b>taste-based discrimination</b> (+). Adopting citizenship, acquiring work experience or signalling religious practice have little effect on employment chances, which is evidence against <b>statistical discrimination</b> (–).</p>
Vuolo, Lageson, and Uggen (2017)	North America (United States of America)	605 fictitious Black applicants (605 White applicants)	Experimental (field)	<p>Call-back rates for Black applicants are compared across those receiving a question about their criminal record and answer it negatively (i.e. having no criminal record) and those who did not receive a question. The results suggest that there exists a difference between both groups, whereby applicants who receive and answer the question witness a higher call-back rate. The authors suggest that <b>statistical discrimination</b> (+) might play a role in the likelihood of a call-back for Black minorities.</p>
Weichselbaumer (2017)	Central Europe (Austria)	1,237 fictitious Serbian, Turkish, Chinese and Nigerian applicants (905 Austrian applicants)	Experimental (field)	<p>The results indicate that there is discrimination against applicants of different origins. The author argues that the discrimination is unlikely due to <b>statistical discrimination</b> (–) because minority applicants are at par with majority candidates concerning schooling and language proficiency and have provided extensive personal information on their resumé. Moreover, discriminatory levels do not vary by characteristics that relate to customer or co-worker interactions, which contradicts <b>taste-based discrimination</b> (–). Alternatively, the author argues that employer preferences are most probably at the root of the uncovered discrimination, which hints at <b>taste-based discrimination</b> (+) as the underlying mechanism.</p>
<i>B. Remuneration</i>				
Altonji and Pierret (2001)	North America (United States of America)	863 young Black US men (2,113 young White US men)	Correlational (panel)	<p>The results show that the unexplained race gap is small at low experience levels and that the gap rises with experience. In addition, the results indicate that the rate of increase is reduced when interactions between experience and skill measures, which are both hard to observe and negatively correlated with race, are also controlled for. This pattern and other results are more consistent with the conclusion that employers only make partial use of race as information when assessing workers, which is interpreted as evidence against <b>statistical discrimination</b> (–). The authors cannot rule out, however, that firms might partially statistically discriminate on the basis of race.</p>

(Continued)



Table 2. Continued.

(1) Author(s) (year)	(2) Region (country)	(3) Minority (majority)	(4) Research design	(5) Main findings related to the mechanisms
Barr and Oduro (2002)	West Africa (Ghana)	1,045 Ghanaian workers with various ethnic backgrounds (N/A)	Correlational (cross-sectional)	The results suggest that Ghanaian production workers are remunerated differently depending on their ethnic background. Although Northern Ghanaians are remunerated less than workers of other ethnic groups as they gain experience, this increasing wage gap is inconsistent with <b>statistical discrimination</b> (–). According to the authors, this result is more in line with the idea that Northerners face language barriers and/or that their lower educational attainment hinders their chances at promotion. Contrarily, inexperienced workers of the same ethnic group receive a positive wage premium that declines with increasing work experience, which provides some evidence for <b>statistical discrimination</b> (+).
Bitzan (2009)	North America (United States of America)	11,791 Black males (167,306 White males)	Correlational (cross-sectional)	The results indicate that the significant differences in earnings between White and Black males can be partially explained by <b>statistical discrimination</b> (+), as White males receive higher rewards (wage) for lower-level productivity signals concerning educational attainment, while Black males receive higher rewards for higher-level signals.
Bjerk (2007)	North America (United States of America)	Black workers (White workers) <sup>f</sup>	Correlational (panel)	The results show that racial wage inequality in the White-collar job sector can be fully explained by controlling for academic skill level while this is only partially true for the blue-collar job sector. Both taste-based and statistical discrimination mechanisms are consistent with the findings. Regarding <b>statistical discrimination</b> (+), it is theorised that the information mismatch in the white-collar job sector is offset by the strong dependency of productivity on academic skill, requiring employers to spend more resources on assessing the applicants' skill levels. Regarding <b>taste-based discrimination</b> (+), it is theorised that academic skill is more important in the white-collar job sector, driving firm competition and thus mitigating discrimination in that sector.
Bodvarsson and Partridge (2001)	North America (United States of America)	127 White NBA players (362 black NBA players)	Correlational (cross-sectional)	The authors developed a model through which they were able to distinguish between employer (proxy: team manager race), co-worker (proxy: team racial composition) and customer discrimination (proxy: willingness to pay to see a team play) in the context of the NBA basketball competition. The results show that White players demand wage premiums for playing alongside Black workers (i.e. employee discrimination) and Black fans prefer to see teams play that, on average, line up a higher number of Black players (i.e. customer discrimination). This is interpreted as evidence in favour of <b>taste-based discrimination</b> (+).
Charles and Guryan (2008)	North America (United States of America)	Black workers (White workers) <sup>9</sup>	Correlational (panel)	The results provide support for several predictions of <b>taste-based discrimination</b> (+) concerning racial animus. They suggest that, at the US state level, relative Black wages vary negatively with the prejudice of the marginal person in the distribution, with the prejudice in the lower (left) tail of the prejudice distribution and with the fraction of the workforce that is Black.
Epstein, Gafni, and Siniver (2016)	Middle East (Israel)	7,746 female Arab university graduates (115,424 female Jewish university graduates)	Correlational (panel)	The findings suggests that Arab women are discriminated against vis-à-vis Jewish women in terms of wages when starting their careers. This wage gap is non-existent for their male counterparts. As time progresses, employees gain experience, the information on productivity-related characteristics increases and the existing wage gap for Arab women gradually disappears. This is evidence in favour of <b>statistical discrimination</b> (+).
Fadlon (2015)	North America (United States of America)	925 Black workers (1,584 White workers)	Correlational (panel)	The results suggest that racial minorities are discriminated against in the US labour market. Moreover, the wage of minority employees is more strongly correlated with productivity, measured by AFQT test scores, when they match the race of their employer than when they do not. Based on the assumption that matched employers



Fryer, Pager, and Spenkuch (2013)	North America (United States of America)	839 Black individuals (3,566 White individuals)	Correlational (panel)	are better informed about same-race employees than non-matched employers, the findings provide support for <b>statistical discrimination (+)</b> . The authors employ a search-matching model of labour market discrimination. The results indicate that the within-firm racial wage gap narrows with tenure by a return-to-tenure rate that is 1.1%-points higher for Blacks than Whites, providing evidence for the employer learning hypothesis that stems from <b>statistical discrimination (+)</b> theory.
Kreisman and Rangel (2015)	North America (United States of America)	546 Black male individuals (1,148 White male individuals)	Correlational (panel)	In contrast with predictions from <b>statistical discrimination (-)</b> , the results suggest that Black-White and dark-light wage gaps diverge over time as employees accumulate experience. On the other hand, the accumulation of experience has different effects for lighter- vis-à-vis darker-skinned Blacks, in line with the dynamic model of <b>statistical discrimination (+)</b> . More specifically, the results suggest that the accumulation of experience produces smaller wage gains for darker-skinned Blacks than lighter-skinned Blacks.
Schaeffer, Höhne, and Teney (2016)	Central Europe (Germany)	Workers of Turkish origin and repatriates (native Germans) <sup>h</sup>	Correlational (cross-sectional)	The authors put forward a signalling model of statistical discrimination in which they argue that if minorities' educational qualifications carry less signalling power, poorly qualified members of the minority group will experience positive discrimination. The results indicate, in line with the authors' model, that poorly qualified persons of Turkish origin appear to enjoy wage advantages in the labour market, which highly qualified peers do not. These findings are in line with <b>statistical discrimination (+)</b> .
C. <i>Employment and Remuneration (Combined)</i> Åslund, Hensvik, and Skans (2014)	Northern Europe (Sweden)	Immigrant workers (native Swedish workers) <sup>i</sup>	Correlational (panel)	The results indicate that managers with an immigration background hire significantly more immigrant workers than native managers. Furthermore, the results show that employee-employer similarity is positively correlated with wages and negatively with exit rates. The biases found are generally more pronounced in the for-profit sector and highly competitive product markets, indicating that profit-maximising concerns might explain the behaviour of employers better than <b>taste-based discrimination (-)</b> .
Borowczyk-Martins, Bradley, and Tarasonis (2017)	North America (United States of America)	1,516 Black male workers in manufacturing (13,184 White male workers in manufacturing)	Correlational (cross-sectional) <sup>l</sup>	The authors constructed a search and matching model of the labour market in which taste-based mechanisms, search frictions and skill complementarities were embedded. The findings suggest that the model, applied to data from the United States manufacturing industry, confirms predictions that employment rates and wages are lower for Black workers vis-à-vis White workers, yet that the variance in wage and employment opportunities is smaller with regard to high-skilled employment. Their findings are in line with <b>taste-based discrimination (+)</b> .
Drydakis (2012)	Southern Europe (Greece)	946 fictitious female applicants of Albanian descent (946 fictitious female applicants of Greek (native) descent)	Experimental (field)	The results indicate that women of Albanian descent face lower chances of occupational access and lower wages vis-à-vis their Greek counterparts. There is no variation with job type as discrimination is not stronger for client-facing jobs (i.e. absence of customer discrimination), which is evidence against <b>taste-based discrimination (-)</b> . When women of Albanian descent disclose additional information about themselves, wage offers increase, which is evidence for <b>statistical discrimination (+)</b> . However, discrimination is not fully eliminated as the wage differential remains significant, which suggests that there remains a certain level of <b>taste-based discrimination (+)</b> .
Hedegaard and Tyrann (2018)	Northern Europe (Denmark)	82 fictitious candidates with a Muslim-sounding name (80 candidates with a Danish-sounding name)	Experimental (field)	The findings indicate that decision-makers discriminate even when their decision causes them to incur a financial penalty. However, discrimination decreases when the price of doing so increases. This is in line with <b>taste-based discrimination (+)</b> . Furthermore, in the condition where no additional information about the candidates' productivity is available, rational beliefs about expected earnings do not explain the uncovered discrimination better, which is evidence against <b>statistical discrimination (-)</b> .

(Continued)

Table 2. Continued.

(1) Author(s) (year)	(2) Region (country)	(3) Minority (majority)	(4) Research design	(5) Main findings related to the mechanisms
Ramachandran and Rauh (2018)	North America (United States of America)	Black self-employed workers (White self-employed workers) <sup>j</sup>	Correlational (panel)	The authors developed a model incorporating taste-based discrimination and 'belief-based' discrimination. As soon as a belief-based mechanism is introduced in the regression analysis, the results indicate that not taste but a 'rational response' to beliefs that others might pursue ethnic discrimination explains the lower participation rates, lower income and reduced success in establishing interlinkages in the self-employment market for Blacks. These results contradict <b>taste-based discrimination (–)</b> .
<i>D. Other (Job Performance and Firm Productivity)</i> Glover, Pallais, and Pariente (2017)	Western Europe (France)	Participants with an ethnic background (native participants) <sup>k</sup>	Quasi-experimental (field, incl. administrative and survey data)	The results demonstrate that there is no evidence of negative 'animus' towards minorities: minorities do not report that biased managers seem to dislike them or assign them to unpleasant tasks. These results contradict <b>taste-based discrimination (–)</b> . In contrast, the results indicate that biased managers spend less time with minority workers (i.e. they have fewer interactions). Because of this reduced interaction, minority workers put forth less effort when working with biased managers. This, in turn, confirms the negative prior biases of the managers, which is evidence in favour of <b>statistical discrimination (+)</b> .
Hjort (2014)	East Africa (Kenya)	426 Kikuyu affiliated workers (498 Luo affiliated workers)	Quasi-experimental (field)	The results suggest that production output is lower in heterogeneous teams than in homogeneous teams as Kenyan workers discriminate against their non-co-ethnic co-workers. After a period of ethnic intra-country conflict, production output further decreased, presumably because of increased interethnic rivalry. Introducing a form of team remuneration significantly increased output in (horizontally mixed) heterogeneous teams. These results are in line with <b>taste-based discrimination (+)</b> .

Notes. The following abbreviations are used: N/A (not applicable), US or USA (United States of America), NHL (National Hockey League), NBA (National Basketball Association), AFQT (Armed Forces Qualification Test). '(+)' denotes supportive evidence, while '(–)' denotes contrary evidence. Regarding the studies that rely on (field) experimental research, the number of fictitious applicants in column three 'Minority (majority)' reflects the number of resumés that were sent out, not the number of unique applicant profiles. The terms between brackets in the fourth column 'Research design' indicate the type of data used (for correlational research) or the research design subtype (for experimental research). The fifth column 'Main findings related to the mechanisms' reflects the classification regarding the empirical evidence on taste-based and statistical discrimination made by the respective authors based on their research findings.

<sup>a</sup>The number of observations per ethnic group ranged from 2,091–18,403.

<sup>b</sup>The total number of observations (sent out resumés) equalled 10,986.

<sup>c</sup>The total number of observations ranged from 488,290–1,123,500 in function of the regression analyses that were performed.

<sup>d</sup>The total sample size was 248.

<sup>e</sup>Sample sizes ranged from 2,317–4,032.

<sup>f</sup>Sample sizes ranged from 259–2,431.

<sup>g</sup>Data at the US state level; the total sample size was 45.

<sup>h</sup>The number of observations per ethnic group ranged from 318–267,966.

<sup>i</sup>The number of observations per ethnic group ranged from 11,618–745,660.

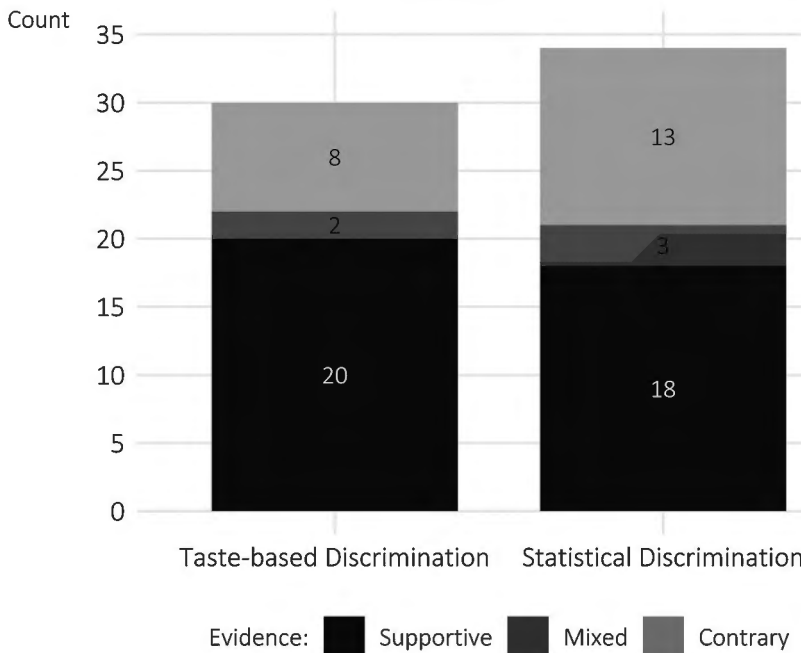
<sup>j</sup>The total number of observations, in function of the regression analyses, ranged from 14,719–26,339.

<sup>k</sup>Sample sizes ranged from 61–220.

<sup>l</sup>The analysis of the data was based on structural estimation.

<sup>m</sup>We are aware that a similar research question has been addressed in previous studies which, in some cases, yielded comparable results (e.g. "Criminal stigma, race, and ethnicity: The consequences of imprisonment for employment.", by S. H. Decker, N. Ortiz, C. Spohn, & E. Hedberg, 2015, *Journal of Criminal Justice*, 43(2), 108–121, doi:10.1016/j.jcrimjus.2015.02.002). However, the results of these studies did not show that the absence of information on the applicant's criminal history (e.g. due to ban-the-box measures) resulted in lower hiring chances for ethnic minorities but merely showed that there is an interaction effect of ethnicity and criminal record on employer call-back. When minority candidates had committed felonies, they were penalised more severely than their majority counterparts. Moreover, the findings of these studies were not interpreted in terms of taste-based or statistical discrimination and hence not included in this review, in line with our eligibility criteria.

<sup>n</sup>Previous research of Asali (i.e. "Jewish–Arab wage gap: What are the causes?", by M. Asali, 2010, *Defence and Peace Economics*, 21(4), 367–380, doi:10.1080/10242694.2010.491716) also seems to support the premise of taste-based discrimination as the dominant mechanism in explaining discriminatory conduct, although this was not explicitly stated in the study.



**Figure 2.** General comparison of the empirical evidence of ethnic taste-based and statistical labour market discrimination.

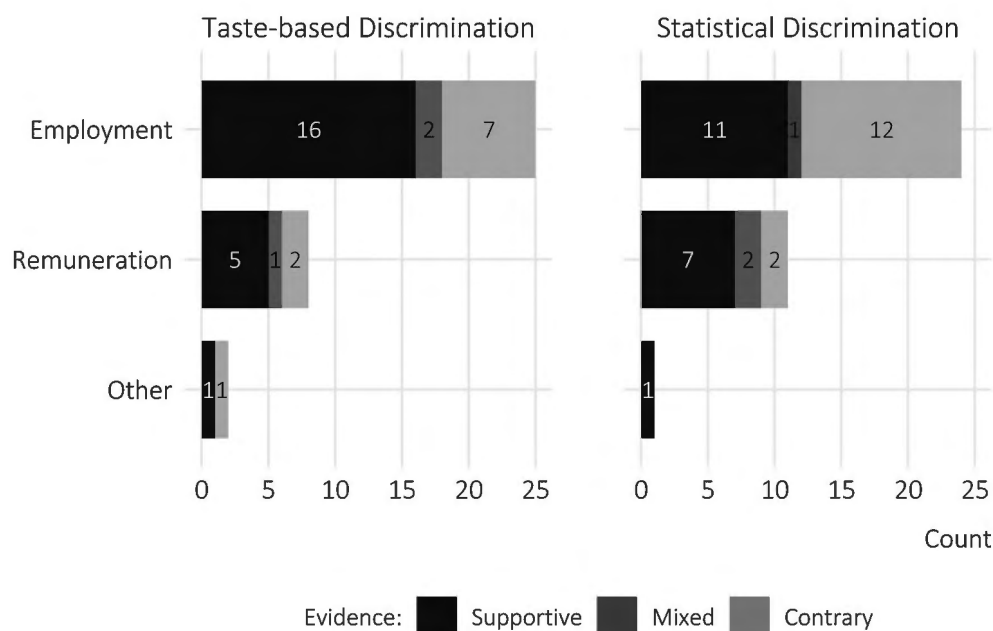
Notes: The statistics in this graph represent the direction and statistical significance of the empirical evidence in the set of studies included in this review and thus indicate possible trends in the labour market discrimination literature. Because these statistics rely on the vote-counting approach, however, their relative weight cannot be interpreted.

concerning statistical discrimination, of which 18 support the mechanism (out of 34; 52.94%), 13 oppose the mechanism (38.24%), and 3 report mixed evidence (8.82%). From this first glance at the literature, the empirical evidence seems to be slightly in favour of taste-based discrimination over statistical discrimination as an explanation for ethnic labour market discrimination. However, based on this count-based analysis, this conclusion cannot be formally inferred.<sup>4</sup>

### 3.2. Heterogeneity of the empirical evidence

In the following paragraphs we discuss to what extent the findings on the empirical evidence of taste-based and statistical discrimination contextually differ concerning (i) the type of labour market outcome measure, (ii) the geographical location, (iii) the minority or racial group considered, and (iv) the design of the research.

First, we consider the heterogeneity of the evidence by labour market outcome (see Figure 3). Research focusing on taste-based discrimination and in which employment outcomes are considered generally appears to favour the mechanism: 16 out of 25 studies (64.00%) provide support for the taste-based mechanism. Moreover, 5 out of 8 studies (62.50%) that report remuneration outcomes provide evidence in favour of taste-based discrimination. In contrast, the empirical evidence seems mixed concerning statistical discrimination based on employment outcomes: less than half of the studies ( $N$



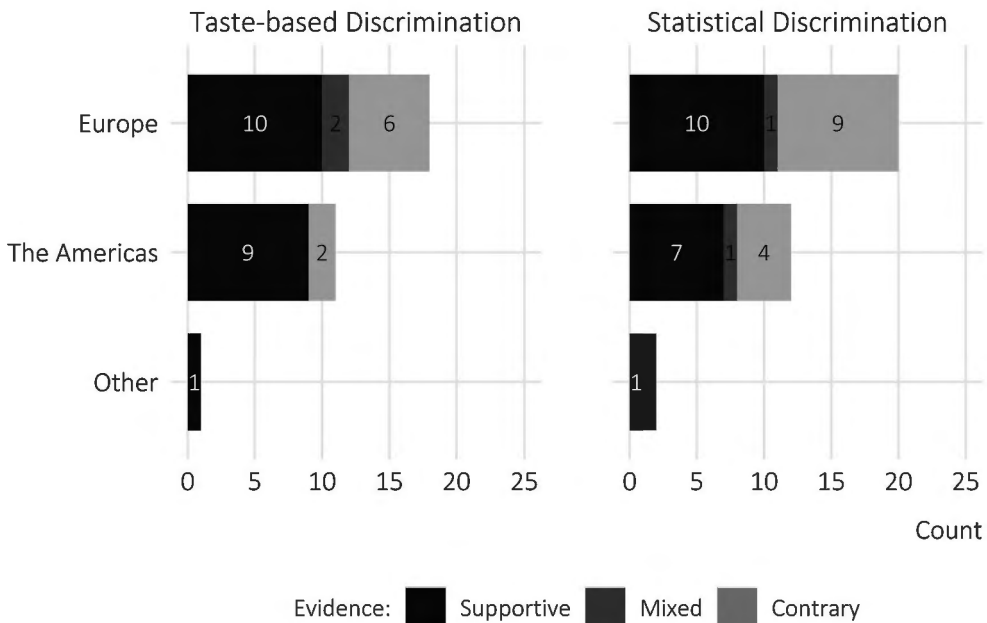
**Figure 3.** Heterogeneity of the empirical evidence of ethnic taste-based and statistical labour market discrimination by labour market outcome.

Notes: The statistics in this graph represent the direction and statistical significance of the empirical evidence in the set of studies included in this review and thus indicate possible trends in the labour market discrimination literature. Because these statistics rely on the vote-counting approach, however, their relative weight cannot be interpreted.

= 12, out of 25; 45.83%) provide support for the statistical mechanism. Similar to the findings on taste-based discrimination, the lion's share of the studies that consider remuneration as a labour market outcome ( $N = 7$ , out of 11; 63.64%) report evidence in favour of statistical discrimination.

Second, we review the contextual differences of the evidence by region (see Figure 4). To facilitate interpretation, the regions are pooled into three broadly defined categories: 'Europe', 'The Americas', and 'Other'. The evidence regarding taste-based discrimination appears generally mixed in research on European data (i.e. 10 out of 18 studies report evidence in favour of the mechanism; 55.55%), while it seems to predominantly support the taste-based mechanism in research on American data ( $N = 9$ , out of 11; 81.82%). This also applies to evidence regarding statistical discrimination: in research on European data, 10 out of 20 studies (50.00%) are in favour of the statistical mechanism while, in the Americas, 7 out of 12 studies (58.33%) report supportive evidence.

Third, we assess the heterogeneity of the evidence by minority classification (see Figure 5). Also here, to facilitate interpretation, ethnic minorities are pooled into five broad categories: 'Various Origins', 'Black', 'Asian', 'African' and 'Other'. This categorisation is based on the United Nations' M49 Standard for nationality (United Nations 2020) or the authors' classification when considering race and religion. The 'Other' category comprises the groups that are examined in only one of the included studies, namely Whites, Europeans, Muslims, and Americans. The variability across classifications makes it difficult to uncover clear patterns. However, we observe two notable results. First,



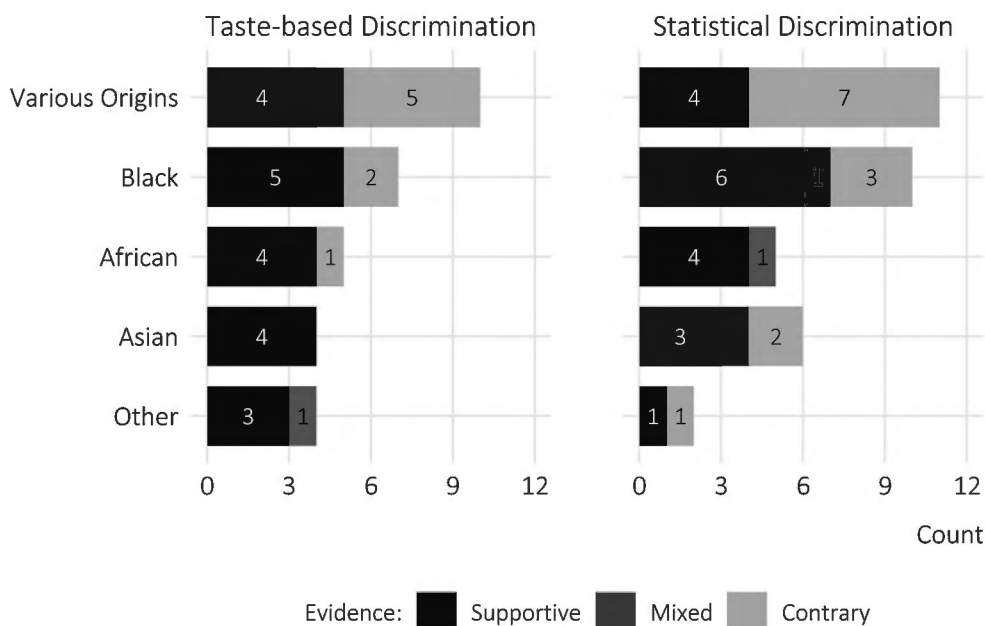
**Figure 4.** Heterogeneity of the empirical evidence of ethnic taste-based and statistical labour market discrimination by region.

Notes: The statistics in this graph represent the direction and statistical significance of the empirical evidence in the set of studies included in this review and thus indicate possible trends in the labour market discrimination literature. Because these statistics rely on the vote-counting approach, however, their relative weight cannot be interpreted.

research in which various ethnic minority groups are taken into account generally seems to produce empirical evidence against the mechanisms: in 5 out of 10 (50.00%) and 7 out of 11 studies (63.64%), the authors argued against taste-based or statistical discrimination, respectively. Second, research in which Africans or Blacks serve as the racial minority group mainly generates evidence in favour of taste-based and statistical discrimination.

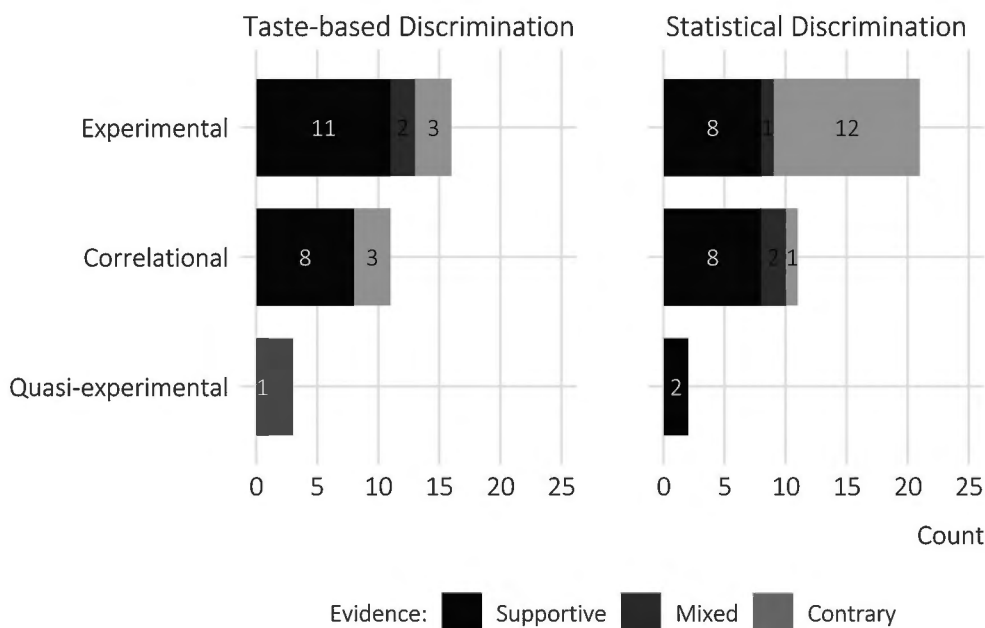
Fourth and last, we evaluate the contextual differences of the evidence by research design (see Figure 6). We consider three broad categories: ‘experimental’, ‘correlational’ and ‘quasi-experimental’ and discover a congruent pattern when examining differences concerning taste-based discrimination. Except for a few studies that use a quasi-experimental design, similar shares of experimental and correlational research report evidence in favour of the taste-based mechanism. Conversely, more than half of the studies that are based on experimental research provide evidence against statistical discrimination ( $N = 12$ , out of 21; 57.14%), while a large majority of the studies that are based on correlational research support said mechanism ( $N = 8$ , out of 11; 72.73%).

Altogether, we discern a common thread through the above findings. Specifically, (i) research focusing on employment outcomes (e.g. hiring intentions) seems to provide more evidence in favour of the taste-based mechanism; (ii) research on North American data typically produces evidence in favour of both mechanisms, while the evidence of research on European data is mixed; and (iii) studies in which the minority classification comprises various minorities of different origins seems to yield more evidence against the



**Figure 5.** Heterogeneity of the empirical evidence of ethnic taste-based and statistical labour market discrimination by minority classification.

Notes: The statistics in this graph represent the direction and statistical significance of the empirical evidence in the set of studies included in this review and thus indicate possible trends in the labour market discrimination literature. Because these statistics rely on the vote-counting approach, however, their relative weight cannot be interpreted.



**Figure 6.** Heterogeneity of the empirical evidence of ethnic taste-based and statistical labour market discrimination by research design.

Notes: The statistics in this graph represent the direction and statistical significance of the empirical evidence in the set of studies included in this review and thus indicate possible trends in the labour market discrimination literature. Because these statistics rely on the vote-counting approach, however, their relative weight cannot be interpreted.



statistical mechanisms but is mixed concerning the taste-based mechanism; and (iv) research based on an experimental research design appears to provide proportionately more evidence for taste-based discrimination and against statistical discrimination. Moreover, all studies focusing on employment outcomes and the majority of studies that are administered in a European context or include various minorities of different origins are based on (field) experimental research designs. In the selected labour market discrimination literature, this type of research design is mainly rooted in the correspondence testing method. This method boils down to the random assignment of ethnic characteristics to resumes of fictitious job candidates, which are subsequently sent out to real employers—the effect of these characteristics on employers' reactions is then measured and causally interpreted (Gaddis 2018; Neumark 2018).<sup>5</sup> Knowing that the empirical evidence relying on this method appears to proportionately produce more evidence for taste-based discrimination, ethnic discrimination in hiring may be better explained by taste-based discrimination as opposed to statistical discrimination.

### 3.3. Differences in measurement operationalisation

Table 3 provides an overview of the various measurement operationalisations of taste-based and statistical discrimination. The classification of the included studies in terms of evidence of taste-based and statistical discrimination is based on the interpretation of the findings made by the respective authors. Nevertheless, throughout this subsection, we also provide alternative explanations for the studies' findings, particularly relying on theoretical work outside of the field of economics.

Evidence for taste-based discrimination is generally measured through four operationalisations: (i) customer contact (i.e. customer discrimination;  $N = 10$ , out of 30; 33.33%); (ii) prejudiced views and attitudes ( $N = 7$ ; 23.33%); (iii) similarity in characteristics ( $N = 6$ ; 20.00%); and (iv) co-worker contact (i.e. employee discrimination;  $N = 4$ ; 13.33%). The general hypothesis in the literature is that, if one of these factors positively moderates the relationship between ethnicity and a specific labour market outcome, the result is considered as empirical evidence in favour of taste-based discrimination. More specifically, 'customer contact' is assessed by comparing unequal treatment between high-customer-contact and low-customer-contact jobs where more discrimination in jobs requiring higher customer contact constitutes evidence for taste-based discrimination (e.g. Bertrand and Mullainathan 2004; Laouénan 2017). In addition, 'prejudiced views and attitudes' are mainly measured by surveying said views and attitudes (e.g. Baert and De Pauw 2014). Furthermore, 'similarity in characteristics' is evaluated by measuring the moderation effect of similarities in personal (ethnic) characteristics or geographical or cultural distance between employees and employers (e.g. Åslund, Hensvik, and Skans 2014; Boyd-Swan and Herbst 2019; Edo, Jacquemet, and Yannelis 2019; Vernby and Dancygier 2019). Last, 'co-worker contact' is assessed by comparing the level of discrimination between jobs where substantial co-worker contact is expected vis-à-vis jobs where this is not the case (e.g. Weichselbaumer 2017). Also here, more discrimination in jobs requiring higher co-worker contact constitutes evidence for taste-based discrimination.

Evidence for statistical discrimination is commonly measured through two operationalisations: (i) information ( $N = 22$ , out of 34; 64.71%) and (ii) employer learning ( $N = 6$ ; 17.65%). First, 'information' is always operationalised by implementing an experimental

**Table 3.** Overview of the various measurement operationalisations of ethnic taste-based and statistical labour market discrimination in the selected studies.

(1) Operationalisation	(2) Description	(3) Illustration
<i>A. Taste-Based Discrimination</i>		
Co-worker contact	Differences in discrimination between high- and low-contact jobs with regard to co-workers.	Weichselbaumer (2017) assessed whether hiring discrimination was due to co-worker preferences by introducing a 'team contact' variable which captured whether the interaction with co-workers was explicitly mentioned in the job advertisement. The results showed that discrimination does not vary by team contact. The author interpreted this as evidence against (taste-based) employee discrimination.
Customer contact	Differences in discrimination between high- and low-contact jobs with regard to customers.	Bertrand and Mullainathan (2004) assessed the relationship between different job types (i.e. administrative jobs and sales jobs) and discrimination. They did not find higher discrimination levels in high-contact jobs, which they considered to be evidence against customer discrimination (i.e. taste-based discrimination).
Economic cycle	Discrimination moderated by economic cycle (e.g. economic downturn).	Asali and colleagues (2018) found that hiring discrimination was positively moderated by the effects of the economic downturn, which is in line with Becker's (1971) hypothesis that taste-based discrimination is worse when the demand for labour weakens.
Financial penalty	Differences in discrimination when discriminatory conduct is financially penalised.	Hedegaard and Tyran (2018) found that discriminatory conduct diminished when the price of doing so increased (in the form of a financial penalty).
Firm competition	Discrimination moderated by competition between firms.	Bjerk (2007) evaluated whether firm competition, related to the competition for high-skilled talent, mitigated discrimination in the white-collar sector. His findings show that this relationship exists, which is in line with Becker's (1971) model of taste-based discrimination and, hence, provides support for the taste-based mechanism.
Firm financial health	Discrimination yields a difference in the financial health of the firm.	Baert and colleagues (2018) evaluated the relationship between the financial health of the firm and hiring discrimination. In contrast to predictions from taste-based discrimination theory, the results indicate that unequal treatment does not yield worse financial health for the firm.
Prejudiced views and attitudes	Differences in discrimination because of differences in views or attitudes towards ethnic minorities.	Baert and De Pauw (2014) linked the outcome of a vignette experiment with survey questions regarding potentially prejudiced views of the participants vis-à-vis ethnic minorities. They found that these views negatively mediated the relationship between ethnic origin and the likelihood of a job interview invitation, which they considered to be evidence in favour of taste-based discrimination.
Similarity in characteristics	Differences in discrimination due to (perceived) similarity in personal characteristics (e.g. candidates sharing overt characteristics with the employer),	Boyd-Swan and Herbst (2019) evaluated the relationship between ethnicity, hiring chances and neighbourhood composition on the basis of ethnicity. The results indicate that racial and ethnic shares (in

(Continued)

**Table 3.** Continued.

(1)	(2)	(3)
Operationalisation	Description	Illustration
	nepotism, ethnic homophily, or similarity in physical or cultural distance.	neighbourhoods) correlate with hiring decisions, benefiting applicants from the most strongly represented ethnic group. This was interpreted as evidence in favour of the taste-based mechanism.
Variability in employment and wages	Discrimination moderated by skill requirements in jobs.	Borowczyk-Martins and colleagues (2017) found that, in line with the predictions of Becker's (1971) model of taste-based discrimination, the lower employment chances and wages of Black workers vis-à-vis White workers varied less when looking at jobs requiring higher skills.
<i>B. Statistical Discrimination</i>		
Employer learning	Discrimination moderated by acquiring additional information about employee work experience, skills and competences.	Altonji and Pierret (2001) found that work experience is related to racial differences in wages. As employers learn about the productivity of their employees, the wage gap rises. However, the rate of increase falls when skill measures are controlled for. Therefore, they concluded that, at best, employers only partially statistically discriminate based on race, which is interpreted as evidence against statistical discrimination.
Firm size	Discrimination moderated by the size of the firm.	Baert and colleagues (2018) hypothesised that larger firms tend to discriminate less than smaller firms as having a dedicated, formalised human resources department and a greater capacity to process applications leads to being able to acquire more accurate information about job applicants. The results show no relationship between firm size and hiring discrimination, unlike predictions based on statistical discrimination theory.
First- and second-generation minorities	Differences in discrimination as a consequence of perceived dissimilarity in skills or competences (e.g. language skills or educational attainment) between first- and second-generation minorities.	Carlsson (2010) hypothesised that first-generation immigrants would have lower chances of receiving job interview invitations vis-à-vis second-generation immigrants because of perceived dissimilarity in language and educational skills. In contrast to predictions from statistical discrimination, they found that first- and second-generation immigrants had similar probabilities of being invited to a job interview, albeit lower than native candidates.
Information	Discrimination moderated by an information condition related to employee productivity (e.g. personality, language skills, criminal history, academic skills and job qualifications).	Kaas and Manger (2012) assessed the relationship between ethnicity, employer call-back and the inclusion of additional information about the candidates. The findings suggest that the inclusion of a reference letter that stated favourable information about minority candidates' personalities positively moderates the negative relationship between ethnicity and employer call-back, which is evidence in favour of statistical discrimination.
Selective attention	Differences in discrimination due to a lack of attention or selective attention.	Baroš and colleagues (2016) found that employers paid less attention to applications

(Continued)

**Table 3.** Continued.

(1) Operationalisation	(2) Description	(3) Illustration
Screening error	Differences in discrimination due to variation in screening error.	from minorities than majorities in the Czech and German labour market, which they labelled 'attention discrimination'. The uncovered discrimination is in line with the mechanism of information asymmetry in statistical discrimination theory. Although, here, the asymmetry is induced by the selective attention of the employers themselves to particular information. Aeberhardt and colleagues (2017) found heterogeneity in terms of hiring and exit rates based on ethnicity. The ethnic disparity in exit rates presumably occurred due to the differing variance of the screening error across ethnic groups. The authors attributed the latter to the mechanism of statistical discrimination.
Stereotyping	Differences in discrimination due to stereotypical views.	Glover and colleagues (2017) found that implicitly biased managers had certain stereotypes related to (the confidence in) the capabilities of ethnic minorities, which fostered ethnic discrimination. They interpreted this as evidence in favour of statistical discrimination.

Notes. The third column 'Illustration' reflects the classification concerning the empirical evidence on taste-based and statistical discrimination made by the respective authors on the grounds of their research findings.

condition where additional information is provided about language skills, academic skills or job qualifications, amongst other productivity signals. Generally, it is assessed whether this condition moderates the relationship between ethnicity and discriminatory conduct. If discrimination is equally high or higher (lower) in the information condition, this is considered as evidence against (for) statistical discrimination (e.g. Baert et al. 2017; Kaas and Manger 2012; Vuolo, Lageson, and Uggen 2017). Second, 'employer learning' is measured by assessing whether gaining additional information about the experience, skills, or competencies of employees over time is affiliated with differences in discrimination (e.g. Altonji and Pierret 2001; Fryer, Pager, and Spenkuch 2013). Typically, if levels of unequal treatment decrease over time, this is interpreted as evidence in favour of statistical discrimination, *ceteris paribus*.

To empirically distinguish between the taste-based and the statistical discrimination mechanism, the authors of the included studies sometimes rely on strong assumptions in their measurement operationalisation.<sup>6</sup> On the one hand, concerning taste-based discrimination, the moderating effect of prejudiced views or attitudes on unequal treatment is mainly operationalised through self-report measures. However, respondents may display socially desirable behaviour when directly answering questions about sensitive topics such as discrimination and racism, which is difficult to account for by design (Krumpal 2013). Moreover, there is limited uniformity in the way the interaction between employer-employee similarity in personal characteristics and discriminatory behaviour is conceptualised. This raises the question to what extent these operationalisations are conceptually valid, identifying and measuring the construct of interest accurately. In this respect, the approach to measuring prejudice in economics is distinctly

different from the standardised approach in psychology, where there is a much stronger emphasis on theory formation as well as on the psychometric qualities of the applied measurement tools (Derous and Ryan 2019; Rust, Kosinski, and Stillwell 2020).

On the other hand, considering statistical discrimination, some research draws on the distinction between first- and second-generation immigrants to assess how much of the detected discrimination is due to the perceived dissimilarity in productivity-related characteristics (e.g. Busetta, Campolo, and Panarello 2018). However, an equally plausible explanation for these dissimilarities could be linked to differences in social or cultural distance between first-generation immigrants and native candidates and between second-generation immigrants and native candidates (e.g. Barr and Oduro 2002). Thus, empirical evidence regarding generational distinctions could also be interpreted in terms of taste-based discrimination (or even relational demography theory) because of its analogies with the evidence from the studies based on the ‘similarity in characteristics’ operationalisation (Becker 1971; Tsui and O’reilly 1989).

Furthermore, the empirical evidence presented in some of the research allows for interpretations that are not exclusive to the economic mechanisms of discrimination. More specifically, concerning taste-based discrimination, the empirical work that relies on operationalisations related to co-worker and customer contact, prejudiced views and attitudes, and similarity in characteristics may also be linked to the theories of intergroup contact, social identity, or relational demography (Hogg 2016; Pettigrew and Tropp 2006; Tsui and O’reilly 1989). A first example relates to the study of Weichselbaumer (2017), who found that hiring discrimination was independent of whether Austrian job advertisements explicitly mentioned professional interactions between co-workers, interpreting this as evidence against taste-based discrimination. Another example is the research of Edo and colleagues (2019), who observed that recruiters preferred same-ethnic job candidates over different-ethnic candidates. However, equally conceivable are hypotheses focusing on (i) potential threats imposed on one’s social identity due to future interaction with ethnic minority co-workers, (ii) prejudice due to contact with these out-group colleagues, or (iii) animosity due to perceived dissimilarity in ethnic characteristics, which are associated with the intergroup contact, social identity, and relational demography mechanisms, respectively.

Finally, we observe three important alternative explanations of the evidence considering statistical discrimination. First of all, the effect of ‘employer learning’ on discrimination assumes that more interaction with minority employees leads to more (accurate) information about the productivity of that employee, which, in turn, leads to less unequal treatment (e.g. Fryer, Pager, and Spenkuch 2013; Kreisman and Rangel 2015). Nevertheless, this may also be due to the exposure itself, where the mere increase in interaction between employer and employee decreases discrimination (Pettigrew et al. 2011). Second, some research regards lower levels of ethnic hiring discrimination in large firms as evidence for statistical discrimination because, due to the higher process formalisation within these firms, recruiters presumably acquire more (accurate) information about job applicants (e.g. Baert et al. 2018). Yet, if recruiters simply conform to organisational rulesets—rather than internalising the reflex to acquire more (accurate) information about job candidates—then it seems more reasonable to attribute this finding to the (meso-level) formalisation of organisational procedures itself instead of the (micro-level) statistical mechanism (Dobbin, Schrage, and Kalev 2015; Fibbi, Midtbøen,

and Simon 2021). Third, statistical beliefs that are grounded in the idea of stereotyping might also be explained by different stereotype-based theories, such as inaccurate statistical discrimination or stereotype content models (Bohren et al. 2019; Fiske et al. 2002). For example, Glover and colleagues (2017) found that the reliance on prior beliefs about the capabilities of ethnic minority employees was associated with workplace discrimination. However, those beliefs were not validated by comparing them with actual differences in capabilities, which does not rule out alternative interpretations.

#### 4. Conclusion

In this review, we charted the recent ethnic labour market discrimination literature that confronts the theories of taste-based and statistical discrimination against the empirical reality. Following the classic structure of a systematic review, we first used a variety of search methods to identify peer-reviewed articles, published between 2000 and 2019, assessing the empirical evidence on the economic mechanisms of ethnic labour market discrimination. Next, we made a selection of these articles, focusing on the following eligibility criteria: (i) empirical studies based on quantitative methods with a (field) experimental or correlational research design; (ii) studies considering minorities who were discriminated against based on their ethnicity; and (iii) studies evaluating differential treatment in terms of labour market outcomes such as employment and remuneration. Finally, we surveyed three main aspects of the included studies: (i) the general findings on the empirical evidence of taste-based and statistical discrimination; (ii) the heterogeneity of this evidence by labour market outcome, geographic region, minority classification, and research design; and (iii) the measurement operationalisations of the discrimination mechanisms.

Based on our predominantly qualitative analysis, the empirical evidence of taste-based and statistical discrimination appeared somewhat mixed. A majority of the included studies provided empirical evidence for both taste-based as well as statistical discrimination. Because there was very limited consistency in research design, it was undesirable and quasi impossible to statistically compare the empirical evidence regarding the mechanisms between the studies. This was also the main reason why we chose not to use meta-analytical methods to analyse this evidence. Therefore, at best, this general finding indicates that there is a discrepancy in the prevalence of the evidence on the economic discrimination mechanisms, suggesting that ethnic labour market discrimination, in the broad sense, cannot be fully explained by either mechanism in itself.

Following this general observation, we narrowed in on the heterogeneity of the empirical evidence. We noticed that studies (i) focusing on employment outcomes (i.e. personnel selection and outplacement), (ii) administered in a European context, or (iii) including several minorities of different origins were typically based on a (field) experimental research design and generally produced more supporting evidence for taste-based discrimination. In the context of labour market discrimination research, this (field) experimental approach usually comprises the correspondence testing method. Together with the fact that correspondence experiments generally enable us to make causal inferences, the above findings suggest that taste-based discrimination could explain ethnic discrimination in hiring better than statistical discrimination.



Furthermore, we observed that the measurement operationalisations of the economic mechanisms of labour market discrimination varied greatly between the included studies and sometimes relied on strong assumptions to justify empirical inductions. On the one hand, taste-based discrimination was mainly examined through the moderation effect on unequal treatment of (i) co-worker and customer contact and interactions, (ii) employer-employee similarity in ethnic characteristics, and (iii) self-reported prejudiced views and attitudes. However, the instruments capturing these self-reported attitudes, for example, have been consistently under-validated, making it difficult to substantiate the claims that the uncovered discrimination is based on contact-avoiding attitudes à la Becker. On the other hand, statistical discrimination was typically operationalised by assessing (i) the differences in discrimination based on information availability and (ii) the effects of employer learning on labour market discrimination. Some research also distinguished between immigrant generations where group differences in discrimination were attributed to presumed dissimilarities in productivity-related characteristics. Yet, these dissimilarities could be related to ethnic salience, too, which could then be explained in terms of taste-based discrimination instead. We believe that we should eventually evolve towards developing a standard for examining the mechanisms of labour market discrimination, similar to how the correspondence testing method has become the standard in examining the incidence of hiring discrimination.

Most notably, some measurement operationalisations left room for interpretations that are not exclusive to the economic discrimination mechanisms. We highlight two of several significant observations. A first observation is that explanations of associations between contact preferences and discrimination, which were linked to taste-based discrimination, could be found outside the field of economics. Interpretations in terms of intergroup contact, social identity, or relational demography theory, *inter alia*, may substitute explanations that one would otherwise frame within taste-based discrimination theory. Alternatively, we believe that the strength of evaluating the taste-based rationale lies in the exploration of distinctly economic propositions, such as the idea that competitive market forces weaken discriminatory conduct or that some individuals are willing to pay a price to avoid contact with ethnic minorities. A second observation relates to the commonly used concept of employer learning in research concerning statistical discrimination. This concept implies that, over time, employers learn about the productivity of minority employees and internalise this information, which eventually reduces unequal treatment. However, in part because this evidence has generally been based on observational data, an alternative explanation, in line with the contact hypothesis, is that the mere interaction with ethnic minority co-workers could (also) lead to less discrimination.

In conclusion, focusing on a narrow set of (ethnic) labour market discrimination mechanisms steers our understanding of discrimination in a specific direction, which influences the remedies we consider and recommend. If the main finding holds—i.e. that discrimination in hiring is mainly driven by the taste-based mechanism—a key policy implication from our review appears that increasing the price of hiring discrimination against ethnic minorities (rather than countering statistical beliefs) is expected to reduce this unequal treatment. This policy implication is based on previous theoretical work as well as empirical research demonstrating that taste-based discriminators are willing to give up some amount of wage to discriminate against ethnic minorities and

that this discrimination is reduced when it is financially penalised. However, valid measurement standards for evaluating the empirical evidence of the (economic) mechanisms of ethnic labour market discrimination used in a multitude of studies across different contexts are required to solidify this finding. Only then, and through the use of appropriate synthesis methods, would it be possible to draw more convincing conclusions from the empirical research on these underlying mechanisms. We count on future research efforts focusing directly on differentiating between the mechanisms of ethnic labour market discrimination to eventually reach the point where such evaluation is possible.

## Notes

1. If these procedures are themselves biased while the discretionary power of hiring managers is suppressed, this could also hinder rather than advance organisational diversity (Dobbin, Schrage, and Kalev 2015).
2. Specifically, we compiled a list of studies that referred to the seminal works on the economic mechanisms of discrimination. After filtering relevant results, the remaining selection of papers was added to the database of records obtained from search.
3. There were 46 unique corresponding authors for the 48 studies in scope of this review.
4. The vote-counting approach has two major limitations (McKenzie and Brennan 2021). First, vote-counting does not provide details about the magnitude of the effects of the individual studies. Second, vote-counting does not take into account the differences in study or sample sizes. Therefore, the counts are only indicative of possible trends in the empirical literature and cannot be interpreted as established associations.
5. Neumark (2018) noted that correlational research often relies on regression-based methods that cannot fully control for all relevant covariates (e.g. productivity-related characteristics or feedback effects). Therefore, it is difficult to establish causal relationships using this type of research.
6. This criticism is shared by Guryan and Charles (2013), who assert that authors may claim that they empirically distinguish between the taste-based and statistical discrimination but that for some empirical evidence alternative models could generate equally convincing patterns pointing in the opposite direction.

## Acknowledgements

We are grateful to Joseph Altonji, Muhammad Asali, Olof Åslund, Abigail Barr, Vojtěch Bartoš, David Bjerk, Lieselotte Blommaert, Örn Bodvarsson, Daniel Borowczyk-Martins, Maria Gabriella Campolo, Magnus Carlsson, Arnaud Chevalier, Pierre-Philippe Combes, Anthony Edo, Dylan Glover, Jonas Hjort, Leo Kaas, Neil Longley, Frances McGinnity, Philip Oreopoulos, Joseph Ritter, Merlin Schaeffer, Kåre Vernby, Michael Vuolo, Doris Weichselbaumer, and Ruta Yemane for their helpful feedback on the descriptions of their research. We are also grateful to Brecht Neyt and Johannes Weytjens for their insightful comments and suggestions. Finally, we are thankful to two anonymous reviewers for stimulating us to extend the theoretical scope of our work, opening it up to a broader readership and allowing a nuanced discussion of our findings.

## Credit authorship contribution statement

LL: Conceptualisation; methodology; formal analysis; investigation; writing – original draft, review & editing; visualisation. SB: Conceptualisation; writing – original draft, review & editing; supervision; funding acquisition. AG: validation; writing – original

draft, review & editing. PPV: Writing – original draft, review & editing; funding acquisition. ED: Writing – original draft, review & editing; funding acquisition.

## Data availability

The data used in this study are available at the following URL: <https://doi.org/10.34740/kaggle/dsv/3157424>.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Funding

This study was conducted in the context of the EdisTools project. EdisTools is funded by Research Foundation – Flanders (Strategic Basic Research, S004119N).

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